Fiscal Policy and Economic Growth: A Study of Assam in North-East India

Mrinmoyee Baishya

Assistant Professor, Department of Economics, Morigaon College.PhD Research Scholar, Department of Economics, Gauhati University.
Professor Gayatri Goswami, Professor, Department of Economics, Gauhati University.

Abstract: Fiscal policy plays an important role in the growth of an economy. Specially in case of an underdeveloped state like Assam in North-East India, where the state is very much dependent on the public sector. This study analyses the impact of fiscal policy on the economic growth of Assam. For this purpose Augmented Dickey Fuller test is used to measure the stationary level of the variables. Johansen co-integration test is used to find out the long run relationship and Vector Error Correction model is used to find out the short term analysis and causality. The ADF test showed the variables to be non-stationary and long run relationship between the variables were found using the co-integration test. VECM model showed expenditure to have significant impact on the growth of the state, while short run discrepancy in the revenue variable showed to be automatically adjusted.

1 Introduction

Keynesian economics changed the outlook of the role of government in nation building. Prior to that the classical school neglected the role of government and believed in the laissez-faire policy. Keynes, on the background of the great depression refuted this idea and emphasised how the government intervention can change the level of output and employment in the economy.Recent studies focuses on the significance of expansionary fiscal policy and how it can stimulate economic growth. This is based on the workingof the multiplier. Government spending will lead to expansion of the private sector and this in turn leads to economic growth. Fiscal policy has an important role to play in the context of emerging countries. Government participation in the economy has expanded in emerging countries, with the goal of alleviating poverty and increasing economic development rates.Fiscal policy can be defined as how a government adjusts its spending and taxation to achieve specified macroeconomic goals. Such macroeconomic goals include achieving higher economic growth, price stabilization, bringing equilibrium in balance of payments etc. A fiscal policy can be expansionary and contractionary and is used depending on the needs of the economy. During a cyclical downturn, countercyclical fiscal expansion can help strengthen aggregate demand and GDP in the short run. Fiscal contraction on the other hand can help to come down an economy that is rising at an unsustainable rate.

Emerging economies devotes a large portion of their resources in meeting their commitments. Expenditures on debt servicing constitute a large portion of their commitments, which leaves little money for infrastructure development and social welfare, among other necessities. A developing country like India faces similar kind of problem and has been undergoing fiscal stress from a long time period. Increased government expenditure and insufficient revenues lead to increased levels of borrowing for the Indian government from 1980s itself. From then onwards the public revenue lagged behind the public expenditure, widening the resource gap and more debt accumulation. Till 1990-91, the fiscal deficit of India increased to 9.4 percent of its GDP.Also the economic crisis of 90s which was due to the high levels of fiscal deficit and public debt worsened the already deteriorating situation of the country. In a federal structure, the success of the country comes out from the all- round development of the states. Development of the state governments were very much dependent upon public finances. This is a common phenomenon for a state like Assam of the North-East India, whose fiscal needs are very much affected by infrastructural bottle necks of the state. Assam is very much dependent on central funds and has been facing a high level of fiscal deficit over the years. The revenue from tax collection has declined from 2010-13 as compared to its burgeoning expenditures. Under these circumstances it is pertinent to study the impact of fiscal policy in the economic growth of a country. Therefore,

the current study is an attempt to analyse the impact of fiscal policy on the economic growth of Assam.

2 Literature Review

The literature related to issue of fiscal policy and economic growth can be divided into theoretical literature and empirical literature. In the theoretical literature , right from the classical economists to the neo-classical, have put forwarded their ideas regarding fiscal policy and economic growth.

The classical school were believers of laissez-faire policy and nullified the role of fiscal policy intervention for economic growth. They believed in the automatic mechanism of the market. Keynes was the pioneer in bringing forward the role and importance of fiscal policy in promoting economic growth. Keynes opposed the idea of automatic labour and claimed that unemployment and economic slowdown are caused by insufficient aggregate demand. According to Keynes, high amounts of government expenditure promote employment, profitability, investment and economic growth by stimulating aggregate demand, through multiplier effects.

German economist Adolph Wagner believed that there is a correlation between economic growth and growth of the government. According to Wagner's law of increasing state activities, as real income rises, so does the share of public expenditure as a percentage of national income.

The endogenous growth models put forwarded by Romer(1990)and Lucas(1988) emphasised investment in human capital and technology for economic growth. They believed that, economic growth will be boosted by an increase in population or a higher population of the individuals working in the knowledge sector.

One of the most significant studies on endogenous growth model was made by Barro (1990). His research article, "Government Spending in Simple Model of Endogenous Growth" reassesses the relationship between fiscal policy and economic growth. Barros's study explains that public spending enhances private capital accumulation and also enhances long-term economic growth.

Apart from these, a vast number of studies have attempted to examine the relationship between fiscal policy and economic growth of various countries around the world. Blanchard and Perroti (1999) were the first to use Vector Autoregression (VAR)approach to find out the effects of fiscal policy on economic growth. Earlier this approach was used to find effect of monetary policy on economic growth. They found that in the post war time, in United States, increase in government expenditure has positive effects on economic growth and increase in taxes has negative effect on economic growth. Perroti (2004) using VAR approach in OECD countries found that fiscal policy has less impact on such countries. Fatas and Mihov (2001) found that positive government spending on innovations are accompanied with large and long-term increases in consumption and employment.

Hansson &Henrekson (1994)by taking data of 14 developing countries from 1970-87, found negative impact of total government spending, consumption spending and transfer payment on total factor productivity. Kneller et al. (1999)found that government spending and taxes only had an impact on growth if they were both positive and distortive. Hyder (2001) concluded that there exists crowding out effect in case of Pakistan and there significant relation between government spending and private investment. He used vector error correction model. Using time series data for the period 1980-2010, Zaman et al. (2012) discovered a bidirectional association between fiscal variables and economic growth. Rosoiu (2015), using vector autoregression method found that increase ingovernment spending and government revenue has positive impact on the

growth rate of Romania. Abdon et al. (2014)found that fiscal policy variables like government expenditure and taxes have significant effect on the economic growth of developing Asia.

In the national level also there has been a number of studies undertaken in this area. Khundrakpam (2003) discovered a long run link between expenditure and economic growth variables in India for the time period 1960 to 1997. Verma &Arora (2010)found that in case of India, Wagner's law was valid for the time period 1950 to 2008. However, Chandra (2004) discovered a negative link between government spending and economic growth.

3. Methodology and Data Source

The study is based on secondary data sources and consist of time series data covering 40 years viz. 1980-81 to 2019-20. The secondary data is collected from the report of State Finances: A study of Budgets, Reserve Bank of India for various years. The data is available for nominal values and so using GSDP deflator, all of the variables are converted to real values. The GSDP deflator is given as-

GSDP deflator = Nominal GSDP/ Real GSDP ×100

The variables taken for the study are GSDP, government expenditure and government revenue. The model is specified as- GSDP= f(EXP, REV). Here GSDP indicates natural log of gross state domestic product which measures economic growth. EXP indicates total expenditure and REV indicates total revenue or revenue receipts of the state government. Total expenditure is a composition of revenue expenditure, capital outlay and loans and advances. Again revenue receipts consist of tax revenue, state own tax revenue, share in central taxes, non- tax revenue, state own non-tax revenue and grants from the centre. Natural log is taken for all the variables specified.

Since the time period consist of 40 years, it went through a lot of changes, be it any kind of natural calamity or policy implementation. So to find out if the trend of any series has been influenced by any event, structural break test has to used. There are different methods of structural break, and in this study the Quandt-Andrews structural break test will be used as it determines the break exogenously. To find the stationarity of the series and for that unit root test will be used, specifically Augmented Dickey Fuller (ADF) test. Johansen co-integration test will be used to find out any long term relationship among the variables and to find out any short term relationship among and error correction mechanism, Vector Error Correction Model (VECM) model will be used.

4. Results and Discussion

4.1 Unit Root Test

Since we are using time series data so regression cannot be applied to the series as it will give us misleading results. So we have to go for unit root test. Here Augmented Dickey Fuller unit root test is used on the variables.

Table 1: Result of Augmented Dickey Fuller Test

Variables	ADF test	
	t statistic	P value
Exogenous: constant		

LNGSDP	1.987351	0.9998
ΔLNGSDP	-5.248526*	0.0001
LNEXP	0.230116	0.9711
ΔLNEXP	-8.748779*	0.0000
LNREV	0.045641	0.9571
ΔLNREV	-8.950455*	0.0000
Exogenous: trend and constant		
LNGSDP	0.002476	0.9949
ΔLNGSDP	-6.112270*	0.0001
LNEXP	-2.372196	0.3876
ΔLNEXP	-2.102136**	0.5262
LNREV	-3.1311767	0.0793
ΔLNREV	-8.619841*	0.0000

Source: Author's own calculation using Eviews 12. *, ** implies significance of the t-statistic at 5% and 10 % level of significance. Δ stands for first difference of the variable.

The result of Augmented Dickey Fuller unit root test implies that all the three variables, LNGSDP, LNEXP and LNREV are significant at level and first difference. The null hypothesis of the presence of unit root can be rejected and thus we can conclude that the variables are non-stationary.

4.2 Structural Break Test

Quandt-Andrews test is used to find out the structural break and the result is given in Table 2.

Table 2: Result of Quandt Andrews Single Endogenous Breakpoint Test

Null Hypothesis H_0: There is no breakpoints within 15% trimmed observations		
Statistic	Value	Probability
Maximum LR F-statistic (1994)	9.790098	0.0000*
Maximum Wald F-statistic (1994)	29.37029	0.0000*
Exp LR F-statistic	3.238598	0.0008*
Exp Wald F-statistic	12.24399	0.0003*
Ave LR F-statistic	5.053773	0.0000*
Ave Wald F-statistic	15.16132	0.0000*

Source: Author's own calculation using Eviews 12. Probabilities are calculated using Hansen's (1997) Method; * implies significance of the corresponding statistics at 5% level of significance.

The result of the Quandt Andrews test shows that there is a break point in the year 1994. Assam was declared as a special category state in the Fifth Five Year plan itself, but the state started enjoying the benefits of special category state from 1990 onwards. The central government grants to loans ratio which was 90:10 for Assam. Again in 1991 the economic reforms came which changed the structure of the economy. Consequently the economy of Assam as well as the entire nation underwent significant policy changes. And that is the probable reason of the structural break at year 1994. This break point year will be incorporated in further analysis. The dummy variable will be-

DUM1994: It takes the value 0 for the period 1980 to 1993 and the value 1 for the time period 1994 and thereafter.

4.3 Co-integration Test

To analyse the long run relationship among the specified variables, the Johansen maximum likelihood test is used. The Johansen test is sensitive to the lag order, so first the optimum lag length is selected using the Vector Autoregressive model. The result of the VAR lag length criteria is given in Table 3 and the result of Johansen co-integration test is given in Table 4 respectively.

Table 3: Result of Optimum Lag Length Criteria

Lag	LR	FPE	AIC	SC	HQ
0	NA	1.98e-06	-1.779942	-1.605789	-1.718545
1	273.7125*	9.14e-10*	-9.468594*	-8.597828*	-9.161608*
2	9.589244	1.59e-09	-8.946203	-7.378823	-8.393628
3	13.25698	2.37e-09	-8.633712	-6.369719	-7.835549

Source: Author's own calculation using EViews 12. *indicates lag order selection by the criterion at 5% level of significance, LR: Sequential modified LR test statistic FPE: Final prediction error AIC: Akaike Information criterion SC: Schwarz Information criterion HQ: Hannan-Quinn Information criterion

Table 4: Result of Johansen Maximum Likelihood test

Hypothesized No of Cointegrating equations	Eigen Value	Trace Statistic	0.05 critical value	Probability**
None*	0.413960	35.36373	29.79707	0.0103
At most 1	0.235414	15.05774	15.49471	0.581
Atmost 2*	0.120002	4.857749	3.841465	0.0275

Source: Author's computation using EViews 12. *denotes rejection of the null hypothesis at 5% level of significance ** Mackinnon-Haug-Michelis (1999) p-values

Table 4 shows the result of Johansen co-integration test among the specified variables. It is clear from the result that the null hypothesis of no co-integration is rejected at 5 percent level of significance. There is long run co-integration among the variables GSDP, government expenditure and government revenue. The long run normalized cointegrating equation is

LNGSDP= -11.95148LNEXP+8.422263LNREV (Standard error= 2.61271, t-statistic=1.89878).

The coefficient signs are reversed in the long run normalized co-integration equation. So the equation implies that government expenditure has a positive impact on GSDP in the long run. An increase in expenditure will lead to an increase in GSDP. Again, government revenue has negative impact on GSDP. An increase in government revenue will lead to a decrease in GSDP and vice versa. Since the variables show a long run relationship it is also necessary to find out the causal relation and short term dynamics among the variables.

4.4 Vector Error Correction and Causality Analysis

The short run relationship and causality analysis among the variables can be found out with the help of Vector Error Correction (VECM) model.Here only one lag based on the VAR lag selection criterion is considered and also considered the dummy variable (DUM1994) in the model.

The VECM model assumes the following three equations.

$$DLNGSDP_t = \alpha_1 + \rho_1 ECT_{t-1} + \beta_{11} DLNGSDP_{t-1} + \beta_{12} DLNEXP_{t-1} + \beta_{13} DLNREV_{t-1} + \gamma_1 DUM1994 + \varepsilon_{1t} \quad (1)$$

$$DLNEXP_t = \alpha_2 + \rho_2 ECT2_{t-1} + \beta_{21} DLNEXP_{t-1} + \beta_{22} DLNREV_{t-1} + \beta_{23} DLNGSDP_{t-1} + \gamma_2\, DUM1994 + \varepsilon_{2t} \quad (2)$$

$$DLNREV_t = \alpha_3 + \rho_3 ECT3_{t-1} + \beta_{31} DLNREV_{t-1} + \beta_{32} DLNEXP_{t-1} + \beta_{33} DLNGSDP_{t-1} + \gamma_3\, DUM1994 + \varepsilon_{3t} \quad (3)$$

Where,

$DLNGSDP_t$= first difference of logarithm of gross domestic product

$DLNEXP_t$= first difference of the logarithm of expenditure

$DLNREV_t$= first difference of the logarithm of revenue

$DLNGSDP_{t-1}$=first difference of logarithm of gross state domestic product with lag 1

$DLNEXP_{t-1}$= first difference of logarithm of expenditure with lag 1

$DLREV_{t-1}$ = first difference of logarithm of revenue with lag 1

ECT1, ECT2, ECT3= error correction terms

α, β = short run coefficients

ε_t =residual series

The result of VECM model is given in Table 5.

Table 5: Result of VECM model

Dependent variable	Variables	Coefficient	Standard error	't' value	Probability
$DLNGSDP_t$	$ECT1_{t-1}$	0.035503	0.069187	0.513141	0.6114
	$DLNGSDP_{t-1}$	0.086151	0.194080	0.443894	0.6601
	$DLNEXP_{t-1}$	0.061360	0.060785	1.009462	0.3203
	$DLNREV_{t-1}$	-0.038592	0.044432	-0.868578	0.3915
	α_1*	0.038200	0.009996	3.821432	0.0006
	DUM1994	-0.015778	0.033262	-0.474346	0.6385
$DLNEXP_t$	$ECT2_{t-1}$*	0.915931	0.182896	5.007927	0.0000
	$DLNEXP_{t-1}$	0.169030	0.160685	1.051932	0.3007
	$DLNREV_{t-1}$	-0.076298	0.117455	-0.649588	0.5206
	$DLNGSDP_{t-1}$	-0.315779	0.513050	-0.615493	0.5426
	α_{2^*}	0.059006	0.026425	2.232939	0.0327

	$DUM1994$	0.074524	0.087927	0.847563	0.4030
$DLNREV_t$	$ECT2_{t-1}$*	-0.275047	0.207348	-1.326501	0.1941
	$DLNREV_{t-1}$	0.029052	0.133158	0.218180	0.8287
	$DLNEXP_{t-1}$	-0.192640	0.182168	-1.057488	0.2982
	$DLNGSDP_{t-1}$	0.906489	0.581642	1.558500	0.1290
	a_3	0.025256	0.029958	0.843052	0.4055
	$DUM1994$	-0.049273	0.099683	-0.494297	0.6245

Source: Author's own calculation using Eviews 12. *implies significance of the variable at 5% level of significance

The result of the VECM model shows that among the three error correction terms, only the value of error correction term of revenue variable is negative, but not significant at 5% level. The negative sign of the error correction term implies that any short run deviation from the equilibrium path will get corrected automatically. Here the value of error correction term of revenue variable is 0.275047, which indicates that there is 27 percent deviations in the short run gets automatically corrected in that year itself. Again the error correction term of expenditure variable is significant but not negative. The significance of the error term indicates that any kind of short run shock from the expenditure variable affects significantly the long term relationship of the variables.

5. Conclusion

It is seen from the above study that fiscal policy has a significant impact on the economic growth of Assam. The unit root test of the variables showed the variables to be non-stationary at first difference. The Johansen co-integration test showed that variables GSDP, revenue and expenditure have a long run relationship and increase in expenditure leads to increase in economic growth of the state government, while increase in revenue lead to decline in the economic growth of the state. This result is similar to that of Blanchard and Perotti (1999), where they undertake a study in United States. Again the error correction result showed that, expenditure has a significant impact on the growth of the state, while short run discrepancy in the revenue variable showed to be automatically adjusted.

6. Bibliography

[1] Abdon, A., Estrada, G. B., Lee, M. and Park, D. (2014).Fiscal Policy and Growth in Developing Asia.ADB Economics Working Paper Series. No 412.

[2] Barro, R. J. (1990). Government Spending in a Simple Model of Endogeneous Growth. Journal of Political Economy, 98(S5), 103-125. doi:10.1086/261726

[3] Blanchard, O and Perroti, R. (1999).An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output.Working Paper 7269, National Bureau of Economic Research. http://www.nber.org/papers/w72

[4] Chandra, R. (2004). Government Size and Economic Growth: An Investigation of Causality in India. Indian Economic Review, XXXIX(2), 295-314.

[5] Fatas, A. and Mihov, I. (2001). The Effects of Fiscal Policy on Consumption and Employment: Theory and Evidence. CEPR Discussion Papers 2760.

[6] Hansson, P., &Henrekson, M. (1994). A New Framework for Testing the effect of Government Spending on Growth. Public Choice, 81(3/4), 381-401.

[7] Hyder, K., 2001. Crowding-out Hypothesis in a Vector Error Correction Framework: A case study of Pakistan.The Pakistan Development Review.40: 4.pp 633–650.

[8] Khundrakpam, J.K. (2003). Public Sector Spending and Economic Growth in India.Reserve Bank of India. https://mpra.ub.uni-muenchen.de/51105/
[9] Kneller, R., Bleaney M. F. and Kneller, N. (1999). Fiscal Policy and Growth: Evidence from OECD Countries.Journal of Public Economics, 74:171-190.
[10] Lucas, R. E. (1988). On the Mechanics of Economic Development. Journal of Monetary Economics, Vol. 22, Issue 1, pp 3-42
[11] Perotti, R. (2004). Estimating the Effects of Fiscal Policy in OECD Countries. IGIER Working Paper No. 276. https://ssrn.com/abstract=637189
[12] Romer, P. M. (1990).Endogenous Technological Change.Journal of Political Economy, 98(5).
[13] Rosoui, I. (2015). The Impact of Government Revenues and Expenditures on Economic Growth.Emerging Market Queries in Finance and Business. 32. Pp 526-533
[14] Verma, S., & Arora, R. (2010). Does the Indian Economy Support Wagner's Law? An EConometric Analysis. Eurasian Journal of Business and Economics, 3(5), 77-91.
[15] Wagner, A. (1883). Three Extracts on Public Finance.In R. A. Musgrave, & A. T. Peacock (Eds.), *Classics in the Theory of Public Finance.* London: Macmillan.
[16] Zaman, K., Shah, I.A., Khan, M. M. and Ahmad, M. (2012).Macroeconomic Factors Determining FDI impact on Pakistan's Growth.South Asian Journal of Global Business Research.1(1). Pp79-95