THE IMPACT OF GOVERNMENT DEBT ON THE ECONOMIC GROWTH OF BHUTAN

SONAM WANGMO

Graduate School of Development Economics, NIDA, Thailand
E-mail: sowans18@yahoo.com

Abstract - The study aims to empirically examine the relationship between the government debt and economic growth in Bhutan. The study was motivated by the unprecedented increase in the level of government debt currently prevailing in Bhutan. To determine the relationship the data were obtained from World Economic Outlook (IMF), World Bank and National statistics Bureau of Bhutan. Time series data from the period 1990 to 2016 were fitted into the regression equation using various economic techniques. The result of Augmented Dicky Fuller (ADF) and Phillips Perron (PP) unit root test suggest that all the variables are non-stationary at level but exhibit stationary after the first difference. The Johansen co-integration test and Vector Error Correction Model (VECM) is employed to investigate the effect of debt on real gross domestic product growth.

Index Terms - Government Debt, Economic Growth, Co-Integration Test, Vector Error Correction Model.

I. INTRODUCTION

Every nation seek to achieve sustained economic growth. However, achieving this objective of economic growth is a major concern especially for the Least Developed Countries (LDCs). Owing to low level of investment and savings, the LDCs faces low capital formation [1]. Moreover, many factor pose problem and proves to be detrimental to the economic growth. One of such factor is the government debt.

Debt is a universal and an acknowledged phenomena faced by all countries irrespective of the economy being small or large. Debt is the total amount of money that the government of a country owes. Given a limited resources and insufficient funds, a country struggles in financing its developmental projects and achieving its national objectives. The means by which the government can generate revenue are by increasing taxes and printing more money. However, the revenue, which the government raises in the form of tax alone is not enough to support the developmental projects and on the other hand printing more money is not a wise decision for the government because it will dissuade the stability of the economy. So for this particular reason a country choose to borrow from both internal and external sources to increase the welfare of the people and to finance the development of the infrastructures that are necessary to achieve economic growth [2]. Debt is not only a problem at the micro economic level but it is also a serious issue at macro-economic level. Almost all the countries in the world encounters the effect of debt but the level to which a country faces this effect differs from country to country. According to the statistics portal, in 2016 the debt of the United States reached 107.35% in relation to the Gross Domestic Product (GDP). The country with the highest public debt in relation to GDP is Japan which recorded a debt of 239.18% in 2016.

In general, the relationship amongst the government debt and economic development is essential for the policy makers and the public and there are some past studies which examines this relationship. Since there is no clear cut answer on the impact of government debt on the economic development of a country, the relationship between government debt and economic growth is much debatable. Past studies and researchers view public debt both as a burden to the society and detrimental to investment and growth as well as beneficial to the economic growth. Different studies in the past has found that incurring debt poses either a positive [3] or a negative [4] impact on the GDP of a country. The impact of government debt depends on how it is being utilized. If the government spends on investment oriented projects such as agriculture, electricity generation and infrastructures it will have a positive growth. On the other hand if the debt is used for private and public consumption then the effect on the economy will be negative. For any government the main reason for borrowing must be for the development of the country rather on consumption. When the borrowed funds are utilized optimally, the debt need not necessarily transform into a debt burden. Over the past years Bhutan have been facing a mixed economic performance. Bhutan being a small and an underdeveloped country, it has very limited resources. The financial institutions and capital markets are not fully developed resulting in the shortage of investable funds. Therefore, the country has been depending on the debt and foreign grants to finance the projects such as electricity generation plants, construction of roads, education, health, agriculture, etc. In Bhutan the debt-GDP ratio was recorded the lowest at 36.90% in 1998 however the situation changed as debt started to grow from 2000. According to the National budget [5],

the highest total public debt recorded by Bhutan was 113% of the GDP in 2016. This increase in government debt has become a national concern. The different political points of view related to the debt burden have raised an intense debate on the potential adverse consequences due to increase of public borrowing on the economic growth of Bhutan. Attributing to continuous increase in the level of debt and in an effort to guide the investment and to guarantee that public debt is kept at a sustainable level, the government has come up with a comprehensive public debt policy.

The main objective of the study is to examine the possible relationship between the government debt and economic growth in Bhutan. The outcome of this research will guide the policy makers to make appropriate decisions on whether the government should continue to rely on debts or resort to additional tax or some other desirable measures.

This study is divided into five chapters. Chapter I is the introduction part. Chapter II is the Literature review which includes the theoretical framework and the empirical review. Chapter III presents the methodology used in the study. Chapter IV discusses the empirical results and finally chapter V presents the conclusion.

II. LITERATURE REVIEW

A. Theoretical framework

The main aim of the research is to find the possible impact of government borrowing on the economic growth.

As per Sala-i-martin, various economic theories on growth fail to recognize the main factors that affect the economic growth. So as measure a cross sectional regression has been recommended. The regression model is as follows:

$$GRDPG = \beta_{0.} + \beta_1 X_{10} + \beta_2 X_{20} + ... + \beta_n X_n + \varepsilon$$

Where GRGDP is the economic growth rate and $X_{10.....}X_n$ are the possible independent variables that may differ from one study to another. The researchers usually include those explanatory variables which best determine the economic growth of that particular economy. For example, [6] employed government debt, the GDP per capita, savings, exports, imports, short term nominal interest rate, population, unemployment, trade and growth rate of population as some of the variables that determined the rate of economic growth (GDP).

Many researchers proposed a theory called a 'dual gap' theory, which explains about the issue of external debt. The theory justifies the purpose why countries resort to external finance to ensure sustained economic growth. The theory suggests that economic development takes place with the increase in investment level. Investment is a function of saving and in some countries, the domestic savings is not sufficient to confirm the development of the economy. Therefore, countries find it logical to obtain external funds to finance the developmental activities. The dual gap analysis states that to achieve economic growth a country needs saving and investment and imported goods. However, to accomplish the goal of economic development, domestic savings may not be enough, which will result in a gap between savings and investment.

B. Empirical Review

Recently, the discussion on debt has captured a lot of attention from the public and policymakers because of the impact it caused on the growth of an economy. A series of researches have been carried out to discover the impact of government indebtedness on the growth of the economy and also to find out the relationship between these variables. However, the findings of those studies were either conflicting, unclear or differed from each other depending on the countries being examined, the time period, the method and the variables included in the model. Empirical studies found both positive and adverse impact of government debt on determining the economic performance of a country and some studies found the causality connection amongst debt and economic growth. Debt have been recognized both as a blessing and a curse on the economic growth.

In a study of 80 developing countries, [7] found that the countries with good policies and institutions faced negative impact from debt when it crossed 15 to 30 percent of GDP. But, however once it exceed 70 to 80 percent, the marginal effect becomes irrelevant. As compared to the countries with bad policies and institutions, these threshold levels are higher. Reference [8] using simple ordinary least square method found that in Ghana debt is negatively associated with growth because of the presence of corruption and inefficient management of the debt. They suggested that revenue should be increased through tax reform programs instead of borrowing. Using structural threshold regression to examine the impact of debt on growth, [9] concluded that in countries with low-democracy regime, high public debt lead to lower growth when compared to countries with high-democracy regime. Reference [10] analyzed the effect of public debt on the economic performance for EMU (European Economic and Monetary Union) countries. They found that in the long run debt had a negative effect on the output depending on the final allocation of the debt i.e. on productive or unproductive expenditure. Reference [11] investigated the relationship between debt and growth for a number

of developing and industrial economies over the period 1970 to 2002. The empirical result provides that for developing countries the lower external debts are associated with high growth rates which is driven by the incidence of public external debt and not by private external debt. And on the other hand there was no significant relationship between debt and growth for the industrial economies. Reference [12] studied the relationship between public debt and economic growth. The analysis is based on the panel data covering seven developed countries over the period 1970 to 2012. In their study, they estimate a random effects model and pooled regression model and their results reveal that there exists a negative relationship between debt and economic growth. Reference [13] confirmed a positive relationship between domestic debt and economic growth in Pakistan over a period 1972 to 2009. The reason of this positive relationship is because the borrowed funds have been used to finance those expenditures of government which contributes to the growth of economy. Empirical result showed that debt was the source which boosted the economic performance in Nepal [14]. Nepal is a mixed economy and a land locked economy with high dependence on foreign aid and agriculture. Employing data of 30 years, [15] found that the government debt, gross domestic product and gross national saving are the important factors which contributed significantly to the growth in Euro Area countries. Reference [16] studied the link between external debt and economic growth for the period 1981 to 2012. Using ordinary least square regression, the study concluded that external debt and the gross domestic product are positively related. This finding is supported the previous study done in Nigeria by [17]. The effect of government debt on the economic development depends on how the debt is being used. Reference [18] found the estimated threshold for government debt to be around 85%. The debt beyond the threshold was detrimental to the economic growth whereas the moderate level boosted growth. A high level of public debt can adversely affect economic growth of capital stocks and productivity [19]. Reference [20] found that at 60% debt level it had less impact on the economic growth whereas beyond 90% the economic performance slowed down. Reference [21] empirically investigated the impact of debt on the economic growth of Malaysia. The study used quarterly data from the first quarter of 2000 to the fourth quarter of 2011. The results from Vector Error Correction Model (VECM) and Vector Auto Regression (VAR) Model found that there is no significant impact of debt on the growth in both short run as well as in the long run. In a study on African external debt problem in comparison to Nigeria and Morocco, [22] concluded that investment was severely hampered by external debt and that fiscal expenditure, balance of payment and global interest rates mainly attributed to the accumulation of debt in these two countries. In an effort to remove the problem, he suggested measures such as development of capital markets, export promotion and privatization. In the study by [23], he found the presence of both short run and long run relationship between the government indebtedness, export and economic growth in Greece. The granger causality showed that in the short run there does not exist a causal relationship between debt and exports but however a unidirectional Granger causality existed from economic growth to government debt in the long run. Reference [24] in his study of the relationship between external debt, exports and economic development in Lebanon found that there existed a unidirectional Granger causality from debt to exports and then from exports to GDP growth. Using the augmented VAR model approach in G7 countries [25] examined the causality direction between debt and economic growth and the study showed that rather than debt causing growth it was the other way round.

III. METHODOLOGY

A. The Model Specification

With some modification we adopt a simple macroeconomic model used by Ada (2016). The model is specified as given below:

$$GDPG_t = \beta_0 + \beta_1 DEBT_t + \beta_2 UNEMP_t + \beta_3 INFL_t + \varepsilon_t$$

The Vector Error Correction Model (VECM) is adopted to determine the growth equation in the short run. The model is specified as given below:

$$\Delta GDPG_t = \beta_1 \Delta GDPG_{t-1} + \beta_2 \Delta DEBT_{t-1} + \beta_3 \Delta UNEMP_{t-1} + \beta_4 \Delta INFL_{t-1} + ECT_{t-1} + \varepsilon_{t-1}$$

Where,
Δ is the difference operator
ECT is the error correction term

B. DATA DESCRIPTION

To investigate the impact of government debt on the GDP growth of Bhutan we use annual time series from 1990 to 2016. Table I presents the definitions and the source of the variables being used for our study.

Table I- Definitions and Sources of the Variables

Variables	Definition	Source
GDPG	Real GDP growth rate. It captures the change in the value of final goods and services produced in an economy for a particular period of time.	World Economic Outlook (IMF)
DEBT		

		World Bank
	Government debt as a percentage of GDP. It shows the effect of	
UNEMP	debt on the GDP growth.	World Bank
INFL	Rate of unemployment (Annual %).	National Statistics Bureau,
	Inflation rate (Annual %)	Bhutan

IV. EMPIRICAL RESULTS

The descriptive statistics of the variables employed in the study are displayed in Table II. The study used annual data from 1990 to 2016 covering a period of 27 years. The GDP growth (GDPG) is the dependent variable which is used as a proxy of economic growth. The explanatory variables includes government debt, unemployment and inflation. To understand the structure of the data descriptive statistics were calculated. The descriptive statistics shows how the data behaved.

Table II- Descriptive statistics

Variable	GDPG	DEBT	UNEMP	INFL
Mean	6.637	59.059	2.655	7.232
Standard Deviation	2.522	22.221	0.816	3.340
Minimum	2.1	27.1	1.3	2.18
Maximum	12.6	107.9	4	15.98
Variance	6.363	493.7	0.667	11.161
Skewness	0.266	0.389	-0.208	0.545
Kurtosis	2.899	2.279	1.752	2.927

Source – summarized by Author

Over the period under study, the economy of Bhutan grew by an average of 6.6 percent. The minimum growth was recorded 2.1 percent and the maximum growth was 12.9 percent. As shown by the standard deviation the growth varied at 2.5 percent. The country's debt averaged 59.05 percent reaching a maximum and minimum of 107.9 and 27.1 percent respectively. The standard deviation was 22.2 percent indicating that the level of government debt varied over the years. The unemployment rate averaged at 2.6 percent within a minimum and maximum of 1.3 and 4 percent respectively. The minimum and maximum level of inflation recorded was 2.1 and 15.9 percent respectively with a standard deviation of 3.3 percent. Skewness shows the distribution of the variables around its mean. The series are normally distributed if the skewness level is zero. A positive skewed variables shows a long right tail and a negative skewed indicates a long left tail. From the result we can see that GDPG, DEBT and INFL are positively skewed while UNEMP is negatively skewed. Kurtosis measures the peakness and flatness of the distribution of series. A series is normally distributed when the Kurtosis value is 3. Kurtosis value above three implies that the distribution is peaked (leptokurtic) and when the value is below three the distribution is platykurtic (flat). As shown in the result the variables are well distributed.

The time series data were tested for its stationary. The stationary test is mandatory because most of the time series data are non-stationary and running the test will help us to avoid spurious regression outcomes. For the study we employ Augmented Dicky Fuller and Phillips Perron unit root test at both level and at first difference. The decision rule for the unit root test is that if the estimated ADF and PP values are higher than the critical values (in absolute terms) we reject the null hypothesis (the variable is non-stationary and there is a presence of unit root) and therefore accept the alternative hypothesis (no unit root and stationary). However if the ADF and PP test statistics are less than the critical value we accept the null hypothesis. The stationary of data is crucial for the Johansen co-integration test. To make the non-stationary series into stationary, the series must be modeled in first difference.

The result from the unit root test in Table III shows that all variables which are non-stationary at level are made stationary at first difference and therefore are integrated of order I(1).

Table III- ADF and PP unit root tests

	Augmented Dicky-Fuller		Phillip-Perron	
Variables	**Level**	**First Difference**	**Level**	**First Difference**
GDPG	-2.831	-5.180*	-2.9	-5.540*
DEBT	-0.14	-4.934*	-0.16	-4.942*
UNEMP	-2.713	-6.445*	-2.626	-6.923*
INFL	-2.014	-5.530*	-1.914	-5.680*

**** implies the level of significance at 1% level**
Source- Authors' computation

To estimate the Johansen co-integration and vector error correction model (VECM) it is important that a lag length be selected. The lag length is selected based on the criterion such as Final prediction Error (FPE), Akaike's Information Criterion (AIC) and Hannan Quinn Information Criterion (HQIC) and Schwarz's Bayesian Information Criterion (SBIC). The most suitable lag length was found to be 1 as presented in Table IV.

Table IV- Optimal lag length selection

Lag length	FPE	AIC	HQIC	SBIC
0	19185.7	21.2133	21.2673	21.4083
1	1156.14*	18.3825*	18.6529*	19.3576*
2	2021.6	18.8281	19.3149	20.5832

Source- Authors' computation

Since all the variables are co-integrated at I(1) there is a probability of co-integration among the variables. We perform co-integration test to find out whether there is a long run relationship among the variables or not. In this study we use the Johansen co-integration approach. To find the number of co-integrating vectors, the Johansen's methodology uses trace statistics. The decision rule for the co-integration test is that if the trace statistics value is higher than the critical values at 5% significance level we reject the null hypothesis of no co-integration and accept the alternative hypothesis of co-integration.

Table V- Johansen Co-integration test result

Null hypothesis	Trace statistics	Critical value (5%)
r = 0	53.9177	47.21
r ≤ 1	27.0116	29.68
r ≤ 2	9.6543	15.41
r ≤ 3	0.5896	3.76

Source- Authors' computation

The result from the Johansen co-integration test displayed in Table V consisting of trace statistics indicates that there is one co-integrating equation. For the null hypothesis H_0:r=0, the result indicates that the trace statistics of 53.9177 is higher than the critical value of 47.21 indicating that the null hypothesis of no co-integration against the alternative hypothesis is clearly rejected. Therefore, the result suggest that there is a long run relationship between the variables under study meaning that economic growth, debt, unemployment and inflation are co-integrated indicating that these variables move together in the long run.

The long run normalized growth equation is shown in Table VI.

Table VI- Long Run Normalized co-integration equation

Dependent variable (GDPG)			
Explanatory Variables	**Coefficient**	**t-stat**	**Prob.**
DEBT	0.0546666**	2.17	0.030
UNEMP	-2.656068*	-4.46	0.000
INFL	0.8172107*	5.28	0.000
_cons	-7.107109		

***, ** and *** denotes 1%, 5% and 10% significance level respectively.**
Source- Authors' computation

From the result we express the long run equation as follows:

$$GDPG_t = 7.107109 - 0.0546666\ DEBT_t + 2.656068\ UNEMP_t - 0.8172107\ INFL_t$$

From the above result we can conclude that government debt and inflation are negatively associated with the growth rate of GDP and are statistically significant at 5% and 1% respectively. The negative coefficient of DEBT indicates that debt hampers the economic development of Bhutan. This negative relationship is supported by the study carried out by [26]. He investigated the relationship amongst external debt and economic growth in Nigeria employing autoregressive distributed lag (ARDL) approach. The findings showed that in the long run debt and economic growth are inversely related. Debt might be used inappropriately which will deter the growth of the entire country. The coefficients of INFL is also negative indicating that inflation has an inverse relationship with the growth of GDP in the long run. This empirical finding is supported by [27].

On the other hand the coefficient of unemployment is positive and statistically significant at 1% significance level. It implies that in the long run unemployment and economic growth are positively related. The reason for this positive relationship is due to the fact that Bhutanese economy is driven by the electricity generation which requires more of advanced technology (Capital intensive method) and less of human resource. This finding is supported by [28]. The outcome of the result indicates that all growth equation determinants supports the hypothesized signs except for unemployment.

The short run co-integration equation result is presented in Table VII. The error correction term (ECT) or the coefficient shows the speed of adjustment caused by any disequilibrium towards the long run equilibrium.

Table VII- short Run co-integration result (Adjustment Parameters)

	Coefficient	Standard error	t-stats	Prob.
GDPG	**-0.479***	**0.127**	**-3.77**	**0.000**
DEBT	1.102***	0.638	1.73	0.084
UNEMP	0.154*	0.041	3.72	0.000
INFL	-0.287***	0.161	-1.78	0.075

*** and *** denotes significance at 1% and 10% respectively.**
Source- Authors' computation

From the result we can specify the short run equation as given below:

$$GDPG_t = 1.102DEBT_t + 0.154UNEMP_t - 0.287INFL_t .$$

We can better understand the movement of the variables in the short run by looking at the coefficients of each variables. The coefficients of GDPG, DEBT, UNEMP and INFL are -0.479, 1.102, 0.154 and -0.287 respectively. From the result it indicates that the speed of adjustment of GDPG, DEBT, UNEMP and INFL from short run disequilibrium to long run equilibrium are 4.7%, 11%, 1.5% and 2.8%

respectively. This signifies that when the GDPG is high it moves towards DEBT by 4.7%. Similarly, given any disequilibrium in the previous year DEBT adjust itself towards GDPG by 11%.

CONCLUSION

The objective of the study is to examine the possible relationship between the government debt and the economic growth of Bhutan. For the study the growth rate of GDP was used as a measure of economic growth. The result of unit root test show that the non-stationary variables exhibit stationary at first difference and the co-integration test result revealed that there exists one co-integrating equation among the variables. Empirical evidence from the study suggests that debt is statistically significant and has a negative impact on the economic growth of Bhutan. It is expected that if the government keep on borrowing then in the long run the Bhutanese economy may not be able to maintain a sustainable economic development. We can conclude that government borrowing is not good for the economic growth. Though the Government can borrow to finance the developmental projects but the burden from the debt can hamper the growth of a country.

As long as the debt servicing is not cleared and in order to minimize the dependency on debt the government should make effort to further boost and pursue internal reforms and sources of revenues as a measure to finance its developmental activities. The concerned authority responsible for managing the government debt should monitor the debt payment obligation and assure that the debt do not cross the ceiling as specified in the public debt policy of Bhutan [29].

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