



GLOBAL JOURNAL OF MANAGEMENT AND BUSINESS RESEARCH: B
ECONOMICS AND COMMERCE

Volume 20 Issue 4 Version 1.0 Year 2020

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals

Online ISSN: 2249-4588 & Print ISSN: 0975-5853

Effect of Public Debt on Economic Growth in Sierra Leone

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Introduction- The government of Sierra Leone in 2017 indicated that increasing borrowings along with tax measures are the only options available to drive the economy out of recession and sustain growth for now Smith (2017). Debt can be defined as any money owed by an individual, firm or government to a lender. Luke (2017) defined debt as a contractual obligation of owing or accumulated borrowing with a promise to payback at a future date. A developing country like Sierra Leone, wanting to mobilize capital resources to foster economic growth may at one-point resort to borrowing. But why do countries borrow? Countries borrow because of their inability to generate enough savings which could be used for investment. According to Johnson (2018) the amount of capital available in most developing countries treasury is grossly inadequate to meet their economic growth needs due to low productivity, low savings and high consumption pattern.

GJMBR-B Classification: JEL Code: F43



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I. INTRODUCTION

The government of Sierra Leone in 2017 indicated that increasing borrowings along with tax measures are the only options available to drive the economy out of recession and sustain growth for now Smith (2017). Debt can be defined as any money owed by an individual, firm or government to a lender. Luke (2017) defined debt as a contractual obligation of owing or accumulated borrowing with a promise to payback at a future date. A developing country like Sierra Leone, wanting to mobilize capital resources to foster economic growth may at one-point resort to borrowing. But why do countries borrow? Countries borrow because of their inability to generate enough savings which could be used for investment. According to Johnson (2018) the amount of capital available in most developing countries treasury is grossly inadequate to meet their economic growth needs due to low productivity, low savings and high consumption pattern. Borrowing is also required if the public sectors do not have enough revenue to provide certain facilities to the public. Public Sectors consists of all government-controlled enterprises including the national and local government which provides basic needs to the society, they do not generate profit. Public debt therefore is a situation whereby a country is experiencing budget deficit which is also referred to as the amount by which spending exceeds revenue or income generated, it occurs when the government borrows to offset her deficit for the development of the economy.

Public debt is grouped into: external or foreign debt and domestic or internal debt. External or foreign debt is the portion of a country's debt owed to foreign creditors. In other words, it is the total debt borrowed from non-residents of a country and does not involve the same currency. It requires the debtor to pay with interest and is not a good way of acquiring revenue because it involves currency risk except it is engaged in productive activities. Domestic or internal debt is the total debt owed to lenders within the economy. It involves the same currency because it is within a country. For external debt or domestic debt to lead to economic growth, a high sense of responsibility must be applied in handling public funds.

Economic growth indicates that a country or economy is making progress following increased labour productivity, improved standard of living and GDP (This is defined as the total value of goods produced in a country by all residents of that country including foreigners) growth. When a nation experiences increase in productive capacity compared to previous years, such a nation is said to be growing. According to Simon (2015), he said that "the capacity to sustain rapidly increasing numbers or slightly lower levels of living can be seen as economic growth. Economist's measure economic growth using different methods including GDP (gross domestic product) and GNP (gross national product). Appropriate use of both domestic and external debt would lead to economic growth.

Sierra Leone like most highly indebted countries has low economic growth and low per capita income with domestic savings insufficient to meet developmental and other national goals. Sierra Leone obtained the first foreign loan of \$1billion in 1978 from the international capital market which did not impact the economy positively in any way. Sierra Leone's external borrowing in the 1980s, was not linked to any growth Osman (2017). As at 2015, Sierra Leone owed the Paris Club of Creditors a sum of \$30billion. Sierra Leone's foreign reserves as at December 31, 2015 was \$29.1billion, according to the data provided by the Sierra Leone apex Bank, the debt management office reported that Sierra Leone's foreign borrowing was Le\$2.11trillion (\$10.7billion), while domestic debt was Le\$10.6trillion (\$54.7billion). Data from the Debt management office showed that Sierra Leone's total public debt as at June, 30 2017 was Le\$ 19.64 trillion (\$64billion) comprising of Le\$15trillion (\$49.2billion) for domestic debt and Le\$4.6trillion (\$15billion) for external debt. Economic growth in Sierra Leone is still very slow because foreign loans carry a lot of exchange rate risks (that is it does not involve the same currency) which makes the economy vulnerable to external shocks Sanusi (2011).

Foreign debt is also linked to different uncertainties as an increase in the value of the United States dollar or increase in the interest rate will increase the debt burden in Sierra Leone. Hence, public debt must be efficiently utilized in order to reach the peak of growth and development in Sierra Leone. It is important to note that the main aim of every economy is to experience growth and improve the standard of living of

the people in it. Any slight mismanagement of funds will lead to a long –term disaster which Sierra Leone is currently facing as excessive public debt in the past has created burden for our future leaders. This study seeks to check whether public debt has an effect on economic growth in Sierra Leone.

a) *Conceptual Review*

According to James (2017), public debt arises as a result of the gap between domestic savings and investment. As the gap expands, debt accumulates and this makes the country to continually borrow. Debt crisis occurs when a country has accumulated a huge amount of debt such that it can no longer effectively manage the debt which leads to several casualty in the domestic political economy. Alfred, James and Thomas, (2010). Mimiko (2017) defined debt crisis as a situation whereby a nation is severely indebted to public sources and is unable to repay the principal of the debt.

The effect of public debt on an economy has been a subject for discussion among academics. Some are of the view that public debt accelerates economic growth Hameed, Ashraf and Chaudhary (2018). This view is in line with Neoclassical model of economic growth in which capital accumulation is viewed as a catalyst to economic growth. This was confirmed by the significant growth by the Asian Tigers (Malaysia, Singapore, Indonesia and Taiwan) and Brazil. These nations were able to transform their economies using public debt Momodu (2012).

The proponents that public debt has negative impact on the economy comes from the fact that at a certain level, debt accumulation becomes a burden and will no longer stimulate economic growth Fullah, James and Thomas (2016). Moreover, the liquidity constraint referred to as 'crowding out' effect of debt, (that is the need to service debt) reduces funds available for investment and growth.

The guiding rules for debt management are: debt to GDP ratio, which global maximum ratio is 40%; total debt to total revenue ratio and debt to debt service ratio. Efficient debt management strategy should result in debt service ratio between 20-25% of GDP Omoruyi, (2016).

i. *Why countries borrow*

Generally, the need for public borrowing arises from the recognized role of capital in the developmental process of any nation as capital accumulation improves productivity which in turn enhances economic growth. There is abundant proof in the existing body of literature to indicate that foreign borrowing aids the growth and development of a nation. Soludo (2015) is of the opinion that countries borrow for major reasons. The first is: macroeconomic intent that is to bring about increased investment and human capital development while the other is to reduce budget constraint by financing fiscal and balance of payment deficits. Furthermore, Sankoh

and Umaru (2017) stressed the fact that countries especially the less developed countries borrow to raise capital formation and investment which has been previously hampered by low level of domestic savings.

Ultimately the reasons why countries borrow balls down to two major reasons which are to bridge the "savings-investment" gap and the "foreign exchange gap". Cherinor (2016) pointed out that the main reason why countries borrow is to supplement the lack of savings and investment in that country. The dual-gap analysis justifies the need for public borrowing as an attempt in trying to bridge the savings-investment gap in a nation. For development to take place it requires a level of investment which is a function of domestic savings and the level of domestic savings is not sufficient enough to ensure that development take place (Sankoh, 2014). The second reason for borrowing from foreign countries is also to fill the foreign exchange (imports-exports) gap. For many developing countries like Sierra Leone the constant balance of payment deficit have not allowed for capital inflow which will bring about growth and development. Since the foreign exchange earnings required to finance this investment is insufficient public borrowing may be the only means of gaining access to the resources needed to achieve rapid economic growth.

ii. *Profile of public debt in Sierra Leone*

According to Matthew, Sellu and Peters (2017), the phenomenon of public debt by Sierra Leone was dated back to 1958, when a loan of US\$ 28.0 million (Le\$19.9 million) was contracted from the World Bank for railway construction. In 1960, Sierra Leone's public debt rose to US \$69.7 million (Le\$49.5 million), by 1970 the public debt was US\$246.0 million (Le\$174.7 million), representing 252 percent increase, and then to US\$346.0 million (Le\$249.1 million) in 1977 due to the fall in mineral prices in the late 1970s which has harmed government financially to meet its obligations. AFRODAD (2017), also affirms that the outrageous increase in Sierra Leone's public debt was as result of a proportional shortage of foreign exchange to meet its developmental needs. Between 1983 and 1988 Sierra Leone's public debt rose to US\$9.8 billion (Le\$44.3 billion) due to Sierra Leone's inability to settle its import bills. In 1990, according to AFRODAD (2017), Sierra Leone's public debt rose again to US\$33.1 billion (Le\$266.1 billion). In 1991 it was reduced to US\$27.5 billion (Le\$221.1 billion) but rose steadily to US\$32.6 billion (Le\$713.9 billion) at the end of 1995. As at 2015, according to CBSL (2014), Sierra Leone's public debt stock was US\$28.0 billion (Le\$2,585.5 billion), 73.2 per cent of this was owed to the Paris Club while the rest was owed to the London Club, the multilateral creditors, promissory note holders and others during the period 2015-2017.

Government pursued debt cancellation which eventually led to drastic reduction of public debt to US\$3.4 billion (Le\$427.8 billion) in 2017. Since then, the nation's debt has steadily increased from US\$3.4 billion (Le\$427.8 billion) in 2017 to US\$3.7 billion (Le\$438.6 billion) in 2018, US\$3.9 billion (Le\$580.7 billion) in 2009, US\$4.5 billion (Le\$676.4 billion) in 2010, US\$5.7 billion (Le\$877.0 billion) in 2011, US\$6.5 billion (Le\$1,023.8 billion) in 2012, US\$9.0 billion (Le\$1,415.8 billion) in 2013, US\$9.5 billion (Le\$1,506.2 billion) in 2014, US\$10.72 billion (Le\$2,062.9) in 2015 and US\$11.41 billion (Le\$3,634.8 billion) in 2016 (Myers, 2015).

iii. *An analysis of Sierra Leonean Public debt management strategies*

Matthew, Sellu and Peters (2017), the gravity of Sierra Leone's debt problem became very obvious in the mid -1980s, and several measures were adopted to manage the debt which includes the following:

II. REFINANCING OF TRADE DEBT

This started with the refinancing of trade arrears in respect of letters of credit outstanding as at July 1983 amounting to \$2.1 billion. This involved repayment period of 30 months January 1984 – July 1986 with a six-month grace period and interest fixed at 1.0 per cent above the LIBOR (London interbank offered rate). Promissory notes were also issued in respect of trade arrears arising from transactions on open account and bills for collection for the sum of \$3.8 billion. The promissory note agreement involved a maturity of six years with a grace period of two and half years. Note that redemption was expected in 14 equal instalments beginning from October 1986. The difficulty in meeting these terms necessitated the capitalizing outstanding interest of \$1.050 billion which brought total commitment on the promissory notes to \$4.89 billion.

1. Negotiation with the London Club of creditors with respect to Commercial Bank debts commenced in 1986.

The total exposure of the banks amounted to \$5.8 billion and Sierra Leone was expected to pay \$1.345 billion per annum. The country could not meet the obligation because of cash flow problem. This resulted in prolonged rounds of negotiation as Sierra Leone demanded the restructuring of the entire debt into a 30 years bond with a grace period of 10 years and interest of 3.0 percent per annum. Eventually both sides agreed on a revised agreement requiring that the principal amount be collateralized with US Treasury Zero Coupon Bonds; interest rate was fixed at 5.5 per cent for the first 3 years and at 6.25 per cent per annum thereafter; and banks which opted for the traditional rescheduling were required to provide 20 per cent of the amount to the option as new money. No bank opted for new money. The agreement was successfully closed on

January 21, 1992. Sierra Leone bought back 62 per cent of the debt and issued collateralized par bonds for the remaining 38 per cent. This allowed Sierra Leone to achieve a debt and debt service reduction as pictured under the Brady Plan.

2. Paris Club Debt Negotiations

Several rounds of rescheduling were undertaken with respect to this class of debt in order to secure relief which was essentially in the form of deferral of debt payment rather than offering debt reduction. Indeed, the approach ensured rapid growth in debt stock largely as a result of the high interest rate attached. The first and second agreement (December 1986 and March 1989) provided for the consolidation and rescheduling of only debt service payments which was due within a period of 15 months. Under the third agreement (Jan. 1991), the debt was rescheduled on terms applicable to the middle income heavily indebted countries. The December 2017 Agreement which was structured in Houston. Terms provided for the rescheduling of Sierra Leone's debt of \$21.4 billion over 18-20 years at relatively high interest rate, but with 10 years grace period.

The latest rounds of debt negotiation concluded in an agreement in principle with the Paris Club to treat Sierra Leone's debt on the "Evian Terms" which allowed a 60 per cent debt reduction. This is however, built on a successful conclusion of a Policy Support Instrument (PSI) currently being put together for the IMF consideration. This agreement provides for a reduction by \$18.0 billion in Sierra Leone's debt to the Paris Club. It also requires that the balance of Le\$12.0 billion should be paid in two equal instruments in less than one year.

Although this offers significant relief to the country if Sierra Leone could strive to raise the outstanding \$12.0 billion, it does not still provide sufficient resources to meet the MDGs. Furthermore, the terms of settling the outstanding debt will seriously create fiscal strain with adverse consequences for the economy.

3. *Debt Conversion and Buy-Back Programme:* This was adopted in July 1988 and designed to achieve debt reduction and reduce debt service burden, encourage capital inflow and assist in recapitalization of the private sector investment and create employment opportunities. Eligible debt for conversion was initially limited to promissory notes, but later extended to cover banks and the Paris Club debts. This method has been used to reduce the value of outstanding promissory notes from \$4.5 billion in 1991 to barely \$783.2 billion in 2014.

4. *Servicing of Multilateral Debt:* Deliberate and conscious efforts were made, in spite of the poor state of the economy, particularly in the mid-1980's and 1990s, to ensure regular servicing of this class of debt. The priority attached to this class of debt is

not unconnected with the consequences of default in debt servicing. These include, the stoppage of further disbursements on such project tied loans and other loans under consideration as well as the loss of credit worthiness of the country.

5. Adoption of Guidelines on public Borrowings

In order to avoid uncontrollable growth of public debt, the Federal Executive Council and the Council of States approved in 2001, a new guideline on public borrowing. The guidelines specified the terms and conditions under which foreign loans could be contracted. For example, the guidelines limit borrowings to financing of projects in the area of poverty reduction and infrastructure development which are assessed on the basis of cost benefit analysis. They must be loans from concessional sources with favourable terms of repayment.

i. *Problems and Prospects of Public debt management in Sierra Leone*

Alfred, James and Thomas (2010) posit that: a major challenge faced by the Debt Management Office is ensuring that a reasonable level of resources is earmarked for debt servicing to avoid the risk of default and to maintain conducive relations for debt relief negotiations with our creditors. The DMO also faces the related challenge of ensuring that budget resources are released in time to effect debt service payments

Managing public debt in Sierra Leone is bedevilled with the following problems:

1. Absence of appropriate institutional framework for the coordination of debt management activities at the sub-national level.
2. Weak public finance management institutions and practices at the state and local government levels.
3. Lack of Coordination of fiscal policies and operations of all tiers of government, amongst others."

For many decades, creditor countries have relied on a "traditional approach" towards addressing Sub-Saharan Africa's debt crisis. This has taken the form of debt rescheduling and refinancing, complemented in varying degrees by minor cancellations especially for debt buy-back; debt conversion and other restructuring mechanisms. In general, debt rescheduling was initially negotiated with debtor countries on a case-by-case basis. This was however replaced by a more systematic framework that applied standard terms to debtor countries and provided little concessions. African countries have been taken through several arrangements, which have evolved over time, for the resolution of official debts. These are briefly reviewed below.

1. The Venice Terms was introduced in 1987 for the poorest countries that were undertaking adjustment. Several African countries benefited from this

rescheduling arrangement, which provided for lower interest rates, and longer payment and grace periods;

2. The Toronto Terms succeeded the Venice Terms in June, 1988 and were made available for the low income, heavily indebted IDA-only countries. Some African countries benefited from this arrangement, which provided lower interest rates, further lengthening of maturities and partial debt service write-offs that together could provide about 33 percent debt service relief.
3. The Houston Terms were proposed in July, 1990 for the middle-income countries and allowed for deferrals of payments, rather than debt reduction. Sierra Leone's debts have been rescheduled four times under this arrangement.
4. The Enhanced Toronto Terms was formulated in 1991 to provide 50 percent debt service reduction as well as other enhancements that could ensure more even spread of debt service payments.
5. The Naples Terms was adopted in December 1994 for the poorest and most-indebted countries. They provided up to 67 percent relief on the net present value of the debt, which could apply to both stock and flows, depending on each country's balance of payments situation. The traditional debt relief efforts highlighted above are centered on a number of key elements which includes:
6. The requirement for adoption of macroeconomic stabilization and structural reform programs endorsed by the Bretton-Woods institutions; and
7. The requirement for establishing a track record of economic reform performance before qualifying for debt relief.

African countries have gone through numerous rescheduling arrangements involving a series of annual negotiations and renegotiations in the endless cycle of debt rescheduling into which many of them have been plunged. These initiatives have failed to alleviate the heavy debt service burden. Indeed, in some cases, they contributed towards increasing the debt stock. The amount of debt rescheduled, the total debt forgiven and the amount of debt stock reduced remain very insignificant, compared with the overall debt stock.

Traditional debt rescheduling has failed and Sub-Saharan Africa still remains in the debt trap. Indebtedness ratios continued to remain very high for Sub-Saharan African countries as a whole. Debt stock to export ratio and Debt stock to GNP ratio remained well above 200 percent and 70 percent respectively up to 2016. This resulted in the launching of the HIPC initiative by the World Bank and the IMF, which sought to place debt relief within an overall framework of poverty reduction.

The case of Sierra Leone is very illustrative of the inadequacies characterizing the current eligibility criteria for debt relief and merits further elaboration here.

The eligibility criteria under the Enhanced HIPC Initiative focus on macroeconomic aggregates in assessing a country's debt burden. Arbitrary thresholds are set for these parameters. Furthermore, little regard is given to human and socio-economic development indices. Based on these economic criteria, Sierra Leone has been adjudged ineligible for relief under the HIPC Initiative. However, in sharp contrast with the illusory-image of an "mineral-rich" country, Sierra Leone is a heavily indebted poor country. A HIPC review, which embraces the so-called "medium-income" debtors, will create the critical mass and momentum of economic activities across the African continent. This will surely accelerate the recovery and growth process to the mutual advantage of all parties concerned.

a) *Theoretical Review*

The Keynesian theory of increasing government activity as a catalyst to economic growth was deemed most appropriate for this study $Y = C + I + G$. According to the theory, for an economy to grow and be stable, active government intervention is required. The Keynesian Economists argue that private sector decisions sometimes lead to inefficient macroeconomic outcomes. Therefore, monetary policy action by Central Bank and fiscal policy action by the government are required to direct the economy. These actions will bring about stability in output over the business cycles.

Keynes stated that during depression, a combination of two approaches must be applied namely: a reduction in interest rate (monetary policy), and government investment in infrastructure (fiscal policy). Both Keynesians and monetarists believe that both fiscal and monetary policies affect aggregate demand (Blinder, 2018). The monetary policy requires CBSL to reduce interest rate to commercial banks and the commercial banks to do the same to their customers. Government investment in infrastructure injects fund into the economy by creating business opportunities, employment and demand. One of the sources of fund for infrastructural development is public borrowing during fiscal deficit.

This implies that Keynesian theory which views capital accumulation as a catalyst to economic growth is supportive of public loans as it injects fund into the economy to increase economic activity resulting in growth. It therefore supports a positive relationship between public debt and economic growth.

Several other theoretical contributions have been made as regards the subject matter of public debt and economic growth and they include:

i. *The dual gap Theory*

Omoruyi (2015) stated that most economies have experienced a shortfall in trying to bridge the gap between the level of savings and investment and have resorted to public borrowing in order to fill this gap. This gap provides the motive behind public debt as pointed

out by Cherinor (2016) which is to fulfil the lack of savings and investment in a nation as increases in savings and investment would lead to a rise in economic growth Hunt (2017). The dual-gap analysis provides a framework that shows that the development of any nation is a function of investment and that such investment requires domestic savings which is not sufficient to ensure that development take place Sankoh (2014). The dual-gap theory is coined from a national income accounting identity which connotes that excess investment expenditure (investment-savings gap) is equivalent to the surplus of imports over exports (foreign exchange gap).

ii. *The dependency theory*

The dependency theory outlined the factors that have contributed to the development of the underdeveloped countries. This theory is based on the assumption that resources flow from a "periphery" of poor and underdeveloped states to a "core" of wealthy states thereby enriching the latter at the expense of the former. The phenomenon associated with the dependency theory is that poor countries are impoverished while rich ones are enriched by the way poor states are integrated into the world system Todaro (2015).

Dependency theory stated that the poverty of the countries in the periphery is not because they are not integrated or fully integrated into the world system as is often argued by free market economists, but because of how they are integrated into the system. From this standpoint a common school of thought is the bourgeoisie scholars. To them the state of underdevelopment and the constant dependence of less developed countries on developed countries are as a result of their domestic mishaps. They believe this issue can be explained by their lack of close integration, diffusion of capital, low level of technology, poor institutional framework, bad leadership, corruption, mismanagement, etc. Momoh and Fehn (2015). They see the under-development and dependency of the third world countries as being internally inflicted rather than publicly afflicted. To this school of thought, a way out of the problem is for third world countries to seek foreign assistance in terms of aid, loan, investment, etc, and allow undisrupted operations of the Multinational Corporations (MNCs). Due to the underdeveloped nature of most LDC's, they are dependent on the developed nations for virtually everything ranging from technology, aid, technical assistance, to culture, etc. The dependent position of most underdeveloped countries has made them vulnerable to the products of the Western metropolitan countries and Breton Woods institutions Ajayi (2017). The dependency theory gives a detailed account of the factors responsible for the position of the developing countries and their constant and continuous reliance on public for their economic growth and development.

iii. *The Solow growth model*

The Solow-growth model was published in 1956 as a seminar paper on economic growth and development under the title, "A contribution to the theory of economic growth". Like most economic growth theories, Solow growth model is built upon some assumptions:

1. Countries will produce and consume only a single homogenous good.
2. Technology is exogenous in the short run.

The Solow growth model is developed based on a Cobb - Douglas production function given by the form:

$$Y = F(L, K) = BL^\alpha K^\beta$$

Where

Y = output

K = Capital input

L = Labour input

B = total factor productivity

α and β are output elasticities of capital and labour respectively and α is a number between 0 and 1.

The other important equation from the Solow growth model is the capital accumulation equation expressed in the form:

$$\dot{K} = sY - dK$$

Where:

$\dot{K}$ = change in capital stock

sY = gross investment

dK = depreciation during the production process

With mathematical manipulation Solow derives the capital accumulation equation in terms of per worker i.e. $\dot{k} = sy - (n+d)k$. This implies that the change in capital per worker is a function of investment per worker, depreciation per worker and population growth. Out of these three variables only investment per worker is positively related with change in capital per worker.

iv. *Solow growth model and public debt*

The Solow growth model was built on a closed economy which makes use of labour and capital as its means of production. Under this scenario the implication of public debt on growth can be seen through its effect on the domestic saving which in turn used as investment in a closed model. The general effect of public debt on the Solow growth model can be analysed by looking at the individual effects of the debt overhang and debt crowding theories on the Solow growth model. According to the debt overhang hypothesis, the government in an attempt to amortize the accumulated debt will increase tax rate on the private sector (as means of transferring resources to the public sector). This will discourage private sector investment and also reduce government expenditure on infrastructure as the resources are used to pay up huge

debt service payments instead of being put into good use. This will lead to a reduction of total (private and public) investment in the economy and a shift downward of both the investment and production function curves in Solow growth model. On the other hand in the case of debt crowding out, in a bid to clear their outstanding debts use their revenue from export earnings and in some cases transfer resources including foreign aid and foreign exchange resources to service their forthcoming debt. Those countries which transfer revenue from export earnings which can be used in investment in the economy to avoid huge debt payments will discourage public investment. This in turn will decrease economic growth and will shift both the investment and production function curves in Solow growth model downward Dereje (2013).

b) *Empirical Review*

The motive behind public debt was to boost economic growth and development of any nation but as a result of future high debt service payments, it posed a serious threat to the economy of that nation. Development Economists have therefore sought out to investigate the implication of public debt burden on the economies of debtor nations using different models, and have come up with diverse views.

Sulaiman and Azeez (2012) carried out a study on the effect of public debt on the economic growth of Sierra Leone using annual time series data covering the period of 1970-2010. The empirical analysis was carried out using econometric techniques of Ordinary least squares (OLS), Augmented Dickey-Fuller unit root test, Johansen Co-integration test and error correction method. The co-integration test shows long-run relationship amongst the variables and findings from the error correction model revealed that public debt has contribute positively to the growth of the Sierra Leonean economy.

An empirical investigation conducted by Audu (2014) examine the impact of external debt on the economic growth and external investment of Sierra Leone. The study used time series data covering the period 1970-2014. The Johansen Co-integration test and Vector Error correction econometric techniques were employed in the study. The study concluded that Sierra Leone's debt service burden has had a significant adverse effect on the growth process and also negatively affected public investment. Another study by Ogunmuyiwa (2011) examined whether public debt promotes economic growth in Sierra Leone using time-series data from 1970-2017. The model was estimated using Augmented Dickey-Fuller test, Granger causality test, Johansen co-integration test and Vector Error Correction Method (VECM). The result revealed that causality does not exist between public debt and economic growth in Sierra Leone.

Clement, Bhattacharya and Nguyen (2015) observed that aside the effect of high debt stock on investment, public debt can also affect growth through accumulated debt service payments which are likely to "crowd out" investment (private or public) in the economy. The crowding-out effect refers to a situation whereby a nation's revenue which is obtained from foreign exchange earnings is used to make debt service payments. This limits the resources available for use for the domestic economy as most of it is soaked up by public debt service burden which reduces the level of investment.

Johnson (2018) examined the impact of the huge public debt, with its servicing requirements on economic growth of the Sierra Leonean and South African economies. The Neoclassical growth model which incorporates public debt, debt indicators, and some macroeconomic variables was employed and analysed using both Ordinary Least Square (OLS) and Generalized Least Square (GLS) techniques of estimation. Their findings revealed that debt and its servicing requirement has a negative impact on the economic growth of Sierra Leone and South Africa. Faraji and Makame (2013) investigated the impact of public debt on the economic growth of Tanzania using time series data on public debt and economic performance covering the period 1990-2010. It was observed through the Johansen co-integration test that no long-run relationship between public debt and GDP. However, the findings show that public debt and debt service both have significant impact on GDP growth with the total public debt stock having a positive effect of about 0.36939 and debt service payment having a negative effect of about 28.517. The study also identified the need for further research on the impact of public debt on foreign direct investments (FDIs) and domestic revenues. Safdari and Mehrizi, (2011) analysed public debt and economic growth in Iran by observing the balance and long term relation of five variables (GDP, private investment, public investment, public debt and imports). Time series data covering the period 1974-2017 was used and the vector autoregressive model (VAR) technique of estimation was employed. Their findings revealed that public that has a negative effect on GDP and private investment and public investment has a positive relationship with private investment.

Ejigayehu (2013) also analysed the effect of public debt on the economic growth of eight selected heavily indebted African countries (Benin, Ethiopia, Mali, Madagascar, Mozambique, Senegal, Tanzania and Umarunda) through the debt overhang and debt crowding out effect with ratio of public debt to gross national income as a proxy for debt overhang and debt service export ratio as a proxy for debt crowding out. Panel data covering the period 1991-2010 was used. The empirical investigation was carried out on a cross-

sectional regression model with tests for stationarity using Augmented Dickey Fuller tests, heteroscedasticity and ordinary regression. The concluding result from estimation showed that public debt affects economic growth through debt crowding out rather than debt overhang.

In their study on public debt relief and economic growth in Sierra Leone, Ekperiware and Oladeji (2012) examined the structural break relationship between public debt and economic growth in Sierra Leone. The study employed the quarterly time series data of public debt, public debt service and real GDP from 1980-2009. An empirical investigation was conducted using the chow test technique of estimation to determine the structural break effect of public debt on economic growth in Sierra Leone as a result of the 2015 Paris Club debt relief. The result revealed that the 2015 public debt relief caused a structural break effect in the relationship between public debt and economic growth. Based on these findings they concluded that the public debt relief made available resources for growth enhancing projects. Umaru, Hamidu and Musa (2013) investigated into the relationship between economic growth, external debt and domestic debt in Sierra Leone for the period 1970-2010 using OLS method. They showed that external debt had a negative impact on economic growth while domestic debt impacted positively on economic growth. Amassoma (2011) examined the causal relationship between external debt, domestic debt and economic growth in Sierra Leone (1970-2009) using the Vector Autoregressive (VAR) and Vector Error Correction (VEC) models. They found out that there was no long run relationship between domestic debt and economic growth while external debt and economic growth showed a long run relationship. He also found a bi-directional causality between domestic debt and economic growth and an un-directional causality from economic growth to external debt in Sierra Leone. He concluded that domestic debt will stimulate economic growth in Sierra Leone. Fajana (2014) he sees nothing wrong with external debt but that debt crisis emanates from mismanagement of such funds. To him, borrowing is desirable and also unavoidable because external debt/borrowing is a first order condition for bridging the domestic gap while the second order condition is that such funds should be invested in viable project whose rate of return is higher than that of the interest rate on the loan. He therefore concluded that for external debt to serve as an engine of growth, it has to be properly managed and resources needs to be prudently and efficiently utilized.

III. METHODOLOGY

Research methodology is a way to systematically solve a research problem. It may be seen as the various steps that a researcher adopted in

studying his research problem along with the logic behind them. This chapter aimed at itemising and discussing the various steps that will be adopted in gathering and processing the research data, it sheds light on the sources of secondary data that will be subjected to econometric analysis. A model with dependent and explanatory variables to be estimated is specified, a-priori expectations of these variables, techniques of estimation and method of data analysis are all treated in this chapter.

a) Model Specifications

The models that will be used for the purpose of this research is formulated based on the dual gap theory, both a simple and multiple regression model will be specified below. One of the sources of fund for infrastructural development is public borrowing during fiscal deficit, this implied that Keynesian theory which viewed capital accumulation as a catalyst to economic growth is supportive of public loans as it injects fund into the economy to increase economic activity resulting in growth (Blinder, 2018). It therefore supports a positive relationship between public debt and economic growth. The following variables, Real Gross domestic product (GDP), External debt (EXTD), Domestic debt (DOMD), Exchange rate (EXCH) are assumed to be determining factor of economic growth in Sierra Leone and will be incorporated into the model. The multiple regression model is stated as:

$$Y=f(x)$$

Y=Dependent variable

X=Independent variable

Where,

$$LRGDP = F (LEXTD, LDOMD, EXCH) \dots\dots\dots (1)$$

$$LRGDP = a_0 + (a_1 LEXTD)_t + (a_2 LDOMD)_t + (a_3 EXCH)_t + U_t \dots\dots\dots (2)$$

$$a_0 > 0, a_1 > 0, a_2 < 0, a_3 < 0$$

Where:

LRGDP = Gross Domestic Product

LEXTD = External Debt

LDOMD = Domestic Debt

EXCR = Exchange Rate

a_0 = Constant intercept

a_1, a_2, a_3 = Slopes of the regressions

U = Error term

t = year

b) Ethical Consideration

Compliance with the relevant principles of acknowledging various authors used in the work to avoid plagiarism was ensured. Dishonest conduct includes manipulation of design and methods, retention or manipulation of data. The researcher avoided any form of dishonesty by using data as obtained by the research instrument.

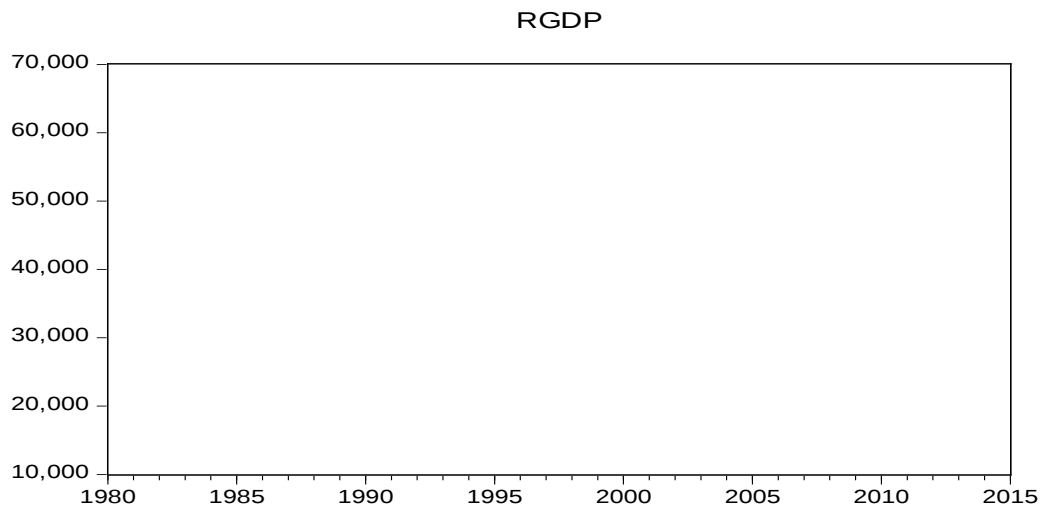
IV. RESULTS AND DISCUSSION

The data for real gross domestic product (RGDP), external debt (EXTD), domestic debt (DOMD) and exchange rate (EXCR) for the period (1980-2015) is presented in Table 4. 1..

Table 4.1: Descriptive Statistics

Statistics	RGDP	EXTD	DOMD	EXCR
Mean	30372.06	1116.329	1706.324	69.444
Median	22060.98	606.6260	531.2906	22.03070
Maximum	69023.93	4890.270	8836.996	192.4405
Minimum	13779.26	2.134250	8.523425	0.617708
Std. Dev	17273.36	1348.268	2485.067	66.28884
Skewness	0.982278	1.464226	1.671655	0.273182
Kurtosis	2.588298	4.034445	4.535015	1.367446
Jarque- Bera	6.043463	14.46885	20.30100	4.445621
Probability	0.048717	0.000721	0.000039	0.108304
Sum	1089794	40184.61	61435.22	2500.004
Sum. Sq. Dev	1.04E+10	63623973	2.16E+08	153797.4
Observations	36	36	36	36

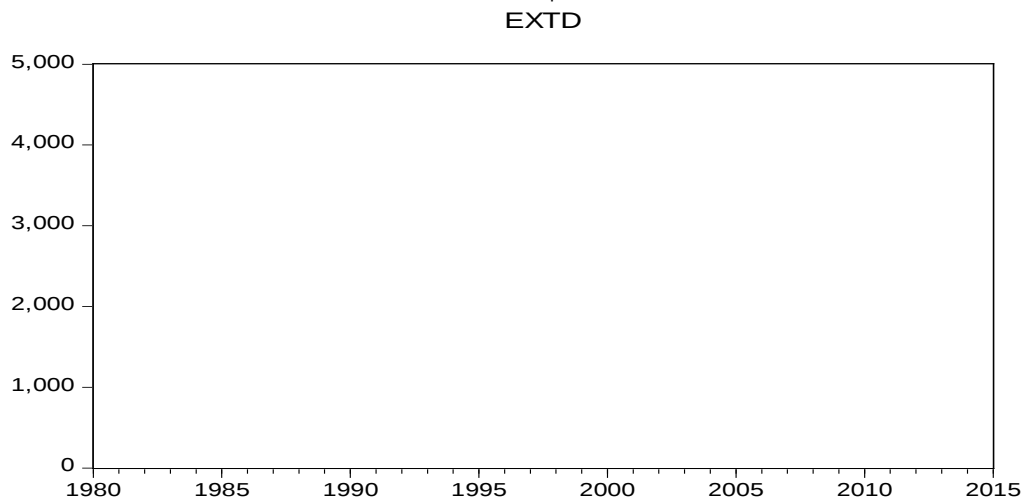
Source: Author's compilation using E- views



Source: Author's compilation using E views 9.0 2018

Figure 4.1: Trend analysis of RGDP

Figure 4.1.1 shows the trend analysis of real gross domestic product (RGDP) from 1980-2015. It shows continuous increase only in the trend of real GDP from the year 1980-2015. RGDP increased from 14,468.02 in 1980 to 15,258.00 in 1981. It fell slightly to 14,985.03 in 1982 and again to 13,849.73 in 1983 and gradually to 13,779.26 in 1984 before attaining an upward trend until 2015 where it stood at 69,023.93

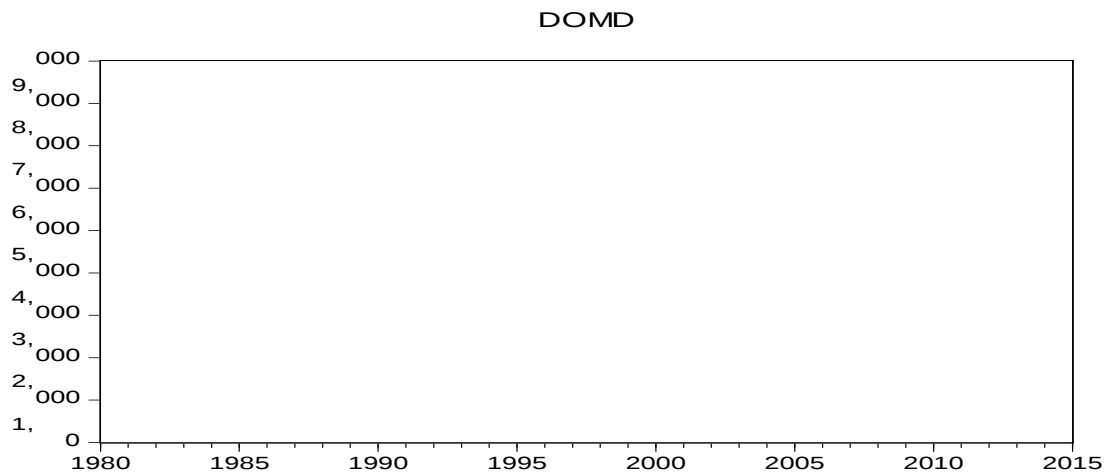


Source: Author's compilation using E views 9.0 2018

Figure 4.2: Trend analysis of EXT D

The trend analysis for external debt (as presented in figure 4.1.2) shows some years where external debt is so low from 2.13 in 1980 to 10.58 in 1983, thereby leading to a rising trend in external debt (EXTD). There was a sharp increase from 1998-2016. Sierra Leone's external debt was 14.81 billion and since then, external debt has constantly increased. In 1985 it was 17.30 billion as it increased again from 41.45 billion in 1986 to 240.39 billion in 1989, indicating an increase of over 200 billion. The situation did not improve in the years that followed as it increased to 298.61 billion in 1990 and then to 716.87 in 1995. Sierra Leone's external debt then reduced to 595.93 billion in 2017 but the value increased again in 1998 to 633.02 billion. A drastic rise

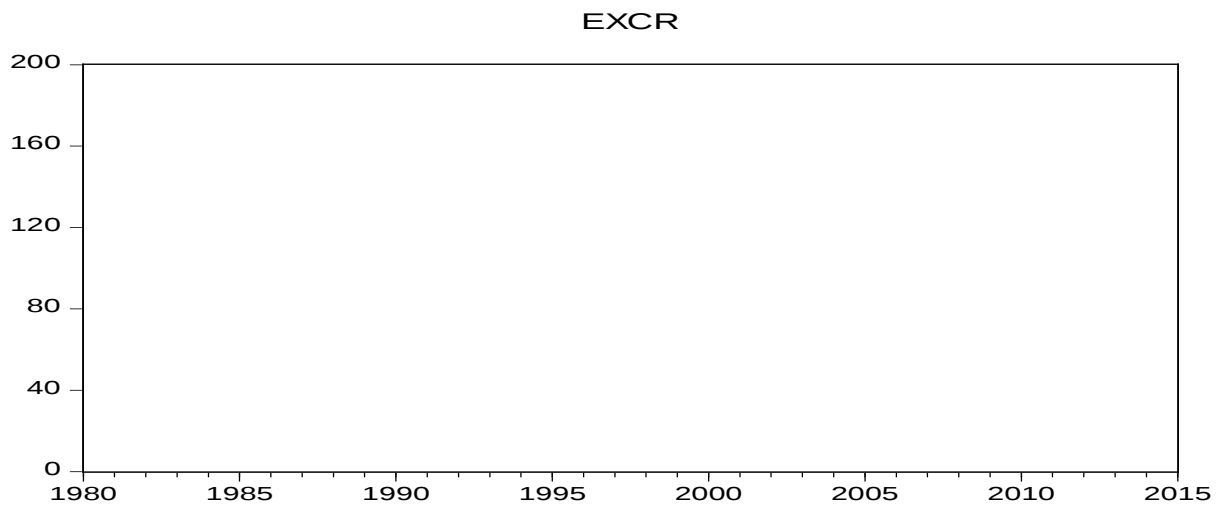
occurred in 2015 as it increased to 2,577.37 billion. The figure then fluctuated from 2015-2015, and reached its highest point which was at 4,890.27 in 2014. Later on, in 2015, Sierra Leone was granted a debt cancellation by the Paris Club and the effect was sudden as there was a drop in the figure to 451.46 as at 2016. Thereafter, Sierra Leone acquired huge loans which rose again to 2,111.53 in 2015.



Source: Author's compilation using E views9.0 2018

Figure 4.3: Trend analysis of DOMD

Figure 4.1.3 shows that there is no increase in same for this period started to increase from 1990- domestic debt from 1981- 1989, domestic debt was the 2015.



Source: Author's compilation using E views9.0 2018

Figure 4.4: Trend analysis of EXCR

Figure 4.1.4 shows the trend analysis of exchange rate (EXCR) from the year 1980-2015 that reflect a lot of fluctuations. From 1980- 1985, it was very low then rose again from 1986. The Sierra Leone Naira slowly lost value with respect to the American Dollar. In 1987 it got to 4.01 Naira to a dollar. From this point the value of Naira to a dollar reduced drastically and reached its highest point in 2014 which was Le\$22.0654 to a dollar. The exchange rate stabilized at Le\$21 to a dollar from the year 1994-1998 with the only fluctuations being in kobo. In 2015, the exchange rate rose again to Le\$92.3381 to a dollar which passed the Le\$100 mark in 2017 and continued to rise and by 2014, exchange rate rose again to Le\$132.888. Nevertheless, it began to reduce from the year 2015-2018, as it went from Le \$131.2743 to Le \$118.546. Recently, it began to increase again from Le \$150.298 in 2010 to 192.4405 in 2015.

a) Stationarity Test Results

This section explains the application of the unit root test which was carried out on the variables to determine their stationary levels. Augmented Dickey Fuller (ADF) test was implemented. The test is based on two statement of hypothesis which are the null and alternative hypothesis.

Table 4.2: Augmented Dickey Fuller Unit Root Test

Series	5% Critical Value	ADF at first difference (Prob.)	ADF Test at first difference	Equation Specification	Order of integration.
LRGDP	-2.951125	0.0218	-3.318382	Intercept	I(1)
LEXTD	-2.951125	0.0434	-3.015530	Intercept	I(0)
LDOMD	-2.951125	0.0015	-4.366387	Intercept	I(1)
EXCR	-2.951125	0.0000	-5.275833	Intercept	I(1)

Source: Authors computation using E-views 9.0 (2018)

The a priori expectation when using Augmented Dickey Fuller test is that a variable is stationary when the absolute test statistic is greater than the critical value at 5%. From table 4.2 the variables, real gross domestic product, domestic debt and exchange rate are all stationary at first difference because their respective absolute test statistic is greater than 5% critical values at

constant and intercept. External debt was stationary at levels. However, real gross domestic product and domestic debt were not stationary at levels and as such were differenced to become stationary. Since the variables were stationary at first difference, Ordinary Least Square (OLS) method would be inappropriate to use.

Table 4.3: Phillip Perron Unit Root Test

Variables	5% Critical Value	Phillip Perron Test (Prob)	Phillip Perron Test at First Difference	Equation Specification	Order of Integration
LRGDP	-2.951125	0.0234	-3.288595	Intercept	I(1)
LEXTD	-2.951125	0.0019	-4.272283	Intercept	I(1)
LDOMD	-2.951125	0.0015	-4.366387	Intercept	I(1)
EXCR	-2.951125	0.0001	-5.275833	Intercept	I(1)

Source: Authors computation using E-view 9.0 (2018)

In table 4.3, the results shows that the variables, real gross domestic product, external debt, domestic debt and exchange rate are all stationary at first difference because the absolute test statistic was greater than 5% critical values at constant and intercept. To test for the reliability of the results, the probability was also tested and the probabilities of each variable is less than 5% level of significance. The result of the variables

being stationary at first difference makes it inappropriate to use the Ordinary Least Square (OLS) method, therefore Johansen co-integration test will be used.

b) Optimal Lag Length Selection

The selection of optimal lag length was very essential before carrying out a Johansen co-integration test.

Table 4.4: Lag Length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-238.2556	NA	27.95851	14.68216	14.86355	14.74319
1	-53.55105	313.4380*	0.001024*	4.457640*	5.364614*	4.762809*
2	-42.97202	15.38768	0.001490	4.786183	6.418737	5.335488
3	-32.42405	12.78543	0.002347	5.116609	7.47472	5.910049

Source: Author's computation using E-views 9.0 (2018)

*indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: -Hannan- Quinn information criterion

c) Johansen Co-integration test result

This test was carried out because it fulfilled the assumption that the variables must be stationary at first difference (I) and the lag interval must be determined which was lag 1 with the selection of Schwartz Information Criterion. There are two types of tests which were considered the Eigen value and Trace statistic test. The decision criteria based on this test is if the trace

statistic is greater than the critical value then reject the null hypothesis and accept the alternative hypothesis. The details of table 4.5 is presented in Appendix 11

Table 4.5: Johansen Co-integration test based on Trace Statistic.

Lag	Eigenvalue	Trace Statistic	0.05 Critical value	Prob**
0	0.551163	46.90258	47.85613	0.0613
1	0.327710	19.66537	29.79707	0.4458
2	0.165269	6.165135	15.49471	0.6760
3	0.000681	0.023162	3.841466	0.8790

Source: Author's computation using E-views 9.0 (2018)

NB: The test indicates no co-integration at 0.05 level

Table 4.5 explains the result of the Johansen co-integration test based on the trace statistic. At none it was seen that the null hypothesis is accepted and the alternative hypothesis is rejected because the trace statistic value (46.90258) is less than the critical value

(47.85613). The result therefore leads to the acceptance of the null hypothesis leading to a short run relationship among the variables. From the test carried out, there was no co-integrating equation, therefore an Ordinary least square method will be implemented.

d) Ordinary Least Square Method

Table 4.6: Ordinary test result

Variables	Coefficient	Standard Error	T- Statistic	Prob.
CONSTANT	9.191962	0.084278	109.0676	0.0000
LEXTD	-0.094426	0.015988	-5.906230	0.0000
LDOMD	0.222171	0.028350	7.836716	0.0000
EXCR	0.003040	0.000684	4.441983	0.0001
Adjusted (R ²)		0.961262	F 290.5012	D- W Stat 0.488356

Source: E-views 8.0 2018

The estimated model of the functional relationship between RGDP and Public debt is:

$$RGDP = 9.191962 - 0.094426LEXTD + 0.222171LDOMD + 0.003040EXCR$$

PROB=	(0.0000)	(0.0000)	(0.0000)	(0.0001)
SE=	(0.084278)	(0.015988)	(0.028350)	(0.000684)
t- Statistic=	(109.0676)	(-5.906230)	(7.836716)	(4.441983)
F- Statistic=	290.5012	Adjusted R ² = 0.961262		
Durbin-Watson =	0.488356			

T- Statistic

LEXTD: From table 4.6, the t-stat result for LEXTD shows that it is not statistically significant at 5% significance level because the calculated t statistic which is -5.906 is less than the tabulated t-statistic 1.694.

LDOMD: From table 4.6, the t-stat result for LDOMD shows that it is statistically significant at 5% significance level because the calculated t-statistic which is 7.836 is greater than the tabulated t-statistic 1.694.

EXCR: From table 4.6, the t-stat result for EXCR shows that it is statistically significant at 5% significance level because the calculated t- statistic which is 4.441 is greater than the tabulated t-statistic 1.694.

R- squared

From table 4.6, R-squared is given as 0.964582 that is 96% of the variations in the dependent variables are explained in the independent variables.

Adjusted R-squared

The estimated adjusted coefficient of determination is 0.961262 that is 96% of the variations in

the dependent variables have been adjusted for variations in the independent variables.

F- Statistic

From table 4.6, the value of the computed F-statistics i.e F_{cal} is 290.5012 and from the F distribution table with the use of 5% level of significance, k-1 and n-k degrees of freedom, the value of F_{tab} is 2.90 ($290.5012 > 2.90$), therefore reject H_0 and accept H_1 .

Standard Error

The standard error test of the least square estimate is necessary to measure the size of the error and determine the degree of confidence in the validity of the estimates. If the null hypothesis states that the variable is not statistically significant while the alternative hypothesis is statistically significant. The decision criteria is to accept the alternative hypothesis and reject the null hypothesis if and only if the standard error is less than the co-efficient divided by 2.

Table 4.7: Standard Error Test Results.

Variables	Standard Error	Co-Efficient	Co-Efficient/2	Decision Criteria
LEXTD	0.015988	-0.094426	-0.047213	Null
LDOMD	0.028350	0.222171	0.1110855	Alternative
EXCR	0.000684	0.003040	1.52	Alternative

Source: Author's computation using E-views 9.0 2018

Table 4.7 showed that the variables, Domestic debt (LDOMD) and Exchange rate (EXCR) are statistically significant while External debt (LEXTD) is not statistically significant based on the acceptance of the null hypothesis and rejection of the alternative hypothesis.

From the estimated model, the constant coefficient in the multiple regression model is given as: 9.191962 which means that when the independent variables (External debt, domestic debt and exchange rate) are fixed at zero or held constant, Real gross domestic product (RGDP) remains 9.191962. This growth will be caused by other inducing factors which are not included in the model. The parameter a_1 has a negative sign that is external debt has an inverse relationship with real gross domestic product. The estimated parameter of the model is -0.094426 which implies that an increase in external debt by 1% will reduce real gross domestic product by 94% while other variables are held constant. The parameter a_2 has a positive sign that is domestic debt has a positive relationship with real gross domestic product. The value

of domestic debt is 0.222171. This means that a 1% increase in domestic debt will lead to a 2.22% increase in real gross domestic product when other variables are held constant. The result is therefore consistent with the apriori expectation that $a_2 > 0$. The parameter, a_3 has a positive sign that is a positive relationship between real gross domestic product. The coefficient of EXCR is 0.003040. This means that a 1% increase in exchange rate will lead to a 30.4% increase in real gross domestic product when other variables are held constant. This result is not consistent with the apriori expectation that $a_3 < 0$.

e) Post- Estimation Test

i. Breusch- Godfrey Serial Correlation Lm Test

This serial correlation test was used to check for the serial relationship between the variables. The null hypothesis states that there is absence of serial correlation while the alternative hypothesis states that there is presence of serial correlation. If the prob.chi square is less than 5% level of significance, then accept the null hypothesis and reject the alternative hypothesis.

Table 4.8: Breusch- Godfrey Serial Correlation LM Test Result

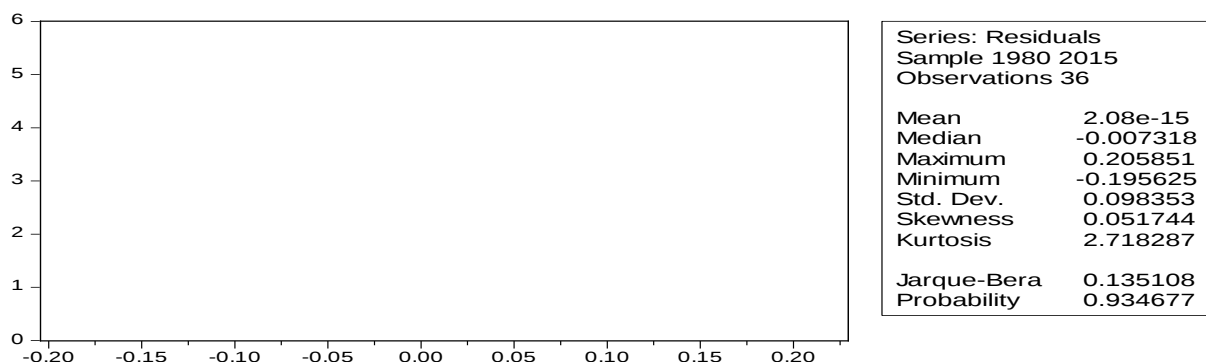
F-statistic	3.114035	Prob. F(3,32)	0.0398
Obs*R-squared	8.134946	Prob. Chi-square(3)	0.04333

Source: Authors computation using E-views 9.0 (2018)

The results above showed the prob. (chi-square) having a value of 0.04333 which is lesser than 5% level of significance. Therefore, we accepted the alternative hypothesis which stated that there is serial correlation.

This test was carried out to check whether the error term follows a normal distribution. The normality test adopted is the Jarque-Bera (JB) Test of Normality. This test computes the skewness and kurtosis measures of the OLS residuals and its probability is statistically significant.

ii. Normality Test



Source: Author's computation using E-Views 9.0 2018

Figure 4.4: Normality test

V. CONCLUSION

The main objective of this study is to specifically examine the effect of public debt which consists of both external and domestic debt on economic growth in Sierra Leone from 1980-2015. Real gross domestic product was used as a proxy for economic growth which is the dependent variable while external debt, domestic debt and exchange rate were the independent variables. The Ordinary least square method was implemented in this study. The results revealed that external debt had a negative effect on the economic growth in Sierra Leone while domestic debt had a positive effect on economic growth in Sierra Leone through encouraging domestic productivity and level of output. External debt is therefore seen as a barrier to the economic advancement and performance of a country. Government should therefore avoid taking external loans. The result revealed that if domestic debt is properly managed, it could lead to high growth rate in Sierra Leone. Based on dual gap theory, the higher the rate of savings and investment the higher an economy tends to grow. Therefore, public debt will lead to economic growth if it is invested properly.

Based on the findings highlighted above, the following recommendations are made:

1. Growth is directly related to savings that is for an economy to grow, they must save and invest a certain proportion of their GDP. The higher the level of savings and investment, the higher the economy tends to grow.
2. To experience economic growth, government should invest borrowed money into capital-based projects at no additional costs. This will help to increase productivity and output level in the country thereby increasing economic growth.
3. External debt should be used strictly for economic reasons and not for social or political reasons in order to avoid accumulation of external debt shock overtime.
4. The government should also increase exportation of domestic goods in order to make our domestic industries known. Note that a high exchange rate would make our goods more attractive to the foreign market.

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