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Implications of External Debt on Zambia's Economic Growth

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ABSTRACT

The presented study shows aspects related to various sectors of the economy which is needed to be able to fully analyze the effect of external debt on economic growth. In this article, we take Zambia as an example, use the World Bank's World Development indicators and observe how they are effecting the economic growth in the long run. The conclusions of this study can be used as a reference for government decision-making.

Keywords: Economic growth, External debt, Unrestricted error correction model

INTRODUCTION

The primary objective of many developing nations is to achieve economic growth and development**.** Many developing nations face significant challenges in generating adequate savings and revenue to effectively pursue their development objectives (Agbemavor, 2015). Consequently, they opt for external borrowing as a means to fund their yearly budget shortfalls. According to the World Bank, external debt is the total public and private debt owed to nonresidents repayable in foreign currency, goods or services. According to economic theory, it is posited that a moderate amount of borrowing has the potential to contribute to increased economic growth, particularly for nations in the first phases of their economic development**.** Consequently, the entity will resort to external borrowing as a means to expedite economic expansion**.** Nevertheless, Nakatani and Herara (2007) argue that utilizing external debt to fund budget deficits may not be a viable solution, but rather a complication in its own right**.** When external loans are allocated towards infrastructural and developmental projects that have the potential to stimulate economic growth and output, it is anticipated that sufficient money would be generated to repay the debt. Nevertheless, in the event that the loan is not utilized to facilitate a productive or income-generating endeavor, the debtor nation may encounter difficulties in repaying the debt, so exerting pressure on the country's available resource. However, a crucial determinant in assessing this matter pertains to a country's ability to fulfill its debt interest obligations through its export revenues. According to Tejiman (2015), An alternative approach involves examining the ratio of a country's debt to its gross domestic product (GDP), which provides insights about the country's ability to sustain its debt. Various countries, such as Zambia, engage in borrowing activities from a diverse range of sources**.** The government has the ability to obtain domestic loans from both the general public and other domestic entities. The government also has the ability to secure loans from external sources. This encompasses both multilateral and bilateral sources. Multilateral debts refer to financial obligations that are owing to international financial institutions, including but not limited to the World Bank and the International Monetary Fund (IMF). Bilateral debts refer to the financial obligations that a country incurs towards other countries or governmental entities. The external debt

situation in Zambia has undergone significant changes over time**.** In the 1980s, the country faced a substantial burden of external debt, which had negative implications for its citizens' ability to benefit from their resources. However, in recent years, Zambia has made progress in reducing its external debt to more sustainable levels. According to Daka *et al.* (2017), Zambia allocated around 86% of its export profits towards debt repayment in 1986, leaving a mere 14% for allocation to other sectors within the economy. The aforementioned pattern persisted despite the introduction of the Highly Indebted Poor Countries (HIPC) initiative. In 1999, Zambia allocated more than three times the amount of its aggregate budget for health, education, and social security towards servicing its debt. As of end 2000, the country's external debt to exports and external debt to gross national income (GNI) stood at 652% and 188.6% respectively. Following the achievement of the HIPC Completion Point (HIPC-CP) in April 2005, bilateral and multilateral creditors implemented debt cancellation measures, leading to a notable decrease of 36.2% in the nation's external debt. Specifically, the debt reduced from US$7,080 million at the end of 2004 to US$4,519.3 million at the end of 2005 (Daka, et al., 2017). As a result, the ratio of the country's external debt to GDP decreased from 130.2% at the end of 2004 to 63% at the end of 2005.

The country experienced a significant reduction in its total outstanding external debt between 2005 and 2006, amounting to 77.9%, as a result of qualifying for debt relief under the Multilateral Debt Relief Initiative (MDRI). This initiative was initiated in 2006 following a proposal made by the G-8 in July 2005, urging the International Monetary Fund (IMF), World Bank (WB), and the African Development Fund (AFDF) to cancel 100% of their debt claims on Highly Indebted Poor Countries (HIPC). The objective of this debt cancellation was to provide these countries with additional resources to make progress towards achieving the United Nations Millennium Development Goals (MDGs). The specific details of the debt relief received by the country can be observed in Figure 1 below. As a result, the ratio of external debt to GDP decreased to 9.3% at the end of 2006. The share of external debt in relation to the overall governmental debt decreased from 65.7% at the end of 2005 to around 31% at the end of 2006.

The significance of this research lies in its potential to shed light on the multifaceted relationship between external debt and economic growth in the Zambian context. Understanding the dynamics of this relationship is essential not only for Zambia's policymakers but also for the broader international community, as it informs decisions regarding debt sustainability, economic stability, and poverty alleviation in developing countries. By examining the implications of external debt on Zambia's economic growth, this research aims to provide valuable insights that cran contribute to evidence-based policy formulation, thereby fostering sustainable economic development in the region.

In 2006, the government obtained six additional loans on concessional terms amounting to approximately US$79.7 million. These funds were allocated towards financing a range of activities, including public service management reforms, investments in the water sector, smallholder livestock investments, and the TAZARA protocol.

In 2007, additional loans were obtained under concessional terms to finance specific priority sectors outlined in the Fifth National Development Plan (2006-2010) of the country. These sectors included road rehabilitation, poverty reduction budget support, water supply and sanitation, as well as the Copperbelt feeder road rehabilitation project, among others.

The increase in export credits of 80.8% can be attributed mostly to the assumption of debt for the Mulungushi Textiles Limited Poject by the government. This loan was part of the non-performing portfolio of the Development Bank of Zambia and was taken over during the same year.

Despite the government's persistence in engaging in external borrowing, it is worth mentioning that by the end of 2011, the government's overall external debt remained below US$ 2 billion, as a percentage of both GDP and exports. Furthermore, this debt primarily consisted of concessional sources. Nevertheless, there was a notable surge in external debt by 61% from 2011 to 2012, resulting in a total of around US$3.2 billion, which is expressed as a percentage of the country's GDP. This information is also depicted in Figure 1. The primary cause that led to the increase in the country's external debt stock during that particular year was the issue of a 10-year US$750 million Eurobond on the international capital market in September 2012, marking the country's debut in this market. The accumulation of external governmental and private debt in Zambia has exhibited an upward trend since 2011. By the conclusion of 2014, the percentage of Gross Domestic Product (GDP) had reached 24%, exhibiting an increase from the 15% recorded in 2011. The observed rise in the stock of external public and publicly guaranteed debt (PPG) of the central government, amounting to a 10 percentage point increase between 2011 and 2014, can largely be attributed to the issue of Eurobonds in the years 2012 and 2014. These Eurobond issuances accounted for 3.0 and 3.8 percent of the country's GDP correspondingly.

METHODOLOGY

The current study used data from 1985 to 2021 obtained from the World Development Indicators (WDI), IMF and other sources. The argument of the study is that a macroeconomic framework linking the various sectors of the economy is needed to be able to fully analyze the effect of external debt on economic growth. As such, a national income identity model augmented with debt and monetary variables was employed. The model explores the linear relationship between output growth and debt burden indicators and is stated as
follows:

$GDPGR_1 = \beta_0 + \beta_1 INVG + \beta_2 HK + \beta_3 OPEN + \beta_3 EDGDP + \beta_4 DRS + \beta_5 LBF + \beta_6 TOT + \beta_7 INF + \beta_8 RER$ (1)

Where

$GDPGR_t$ = real GDP growth rate at time t;
INVG = real gross domestic investment as a percentage of GDP (+);
HK = Human capital proxied by expenditure on education as a percentage of GDP (+);
OPEN = Trade openness (+);
EDGDP = stock of external debt to GDP ratio (-);
DSR = the debt service as a ratio of export earnings (reflects the 'crowding-out' effect) (-);
LBF = Labour force participation as a percentage of total population (+);
TOT = terms of trade (captures external shocks) (- or +);
INF = rate of inflation (reflects macro- economic stability) (- or +);
RER = movements in real exchange rate (reflects incredibility of policies) (-);

The ARDL model approach starts with construction and estimation of the following unrestricted error correction model (UECM) using OLS to ensure for the occurrence of long run relationship between the variables under consideration.

$$\Delta Y_{t-i} = \alpha_0 + \sum_{i=1}^{k} B\, \Delta Y_{t-I} + \sum_{i=0}^{k} \gamma\, \Delta X_{t-I} + \theta_1 Y_{t-I} + \theta_2 X_{t-I} + \varepsilon_t$$

Where, Δ is first difference operator, t Y is the vector of dependent variables, t X is the vector of independent variables, K is the number of lags and t ε is the error term which is assumed to be white noise. The augmented model used in this study is stated as follows:

$\Delta GDPGR_t = \alpha_0 + \sum_{i=1}^{k} \alpha_{1i}\Delta GDPGR_{t-I} + \sum_{i=0}^{k} \alpha_{2i}\Delta INVG_{t-I} + \sum_{i=0}^{k} \alpha_{3i}\Delta HK_{t-I} + \sum_{i=0}^{k} \alpha_{4i}\Delta OPEN_{t-I} + \sum_{i=0}^{k} \alpha_{5i}\Delta EDGDP_{t-I} + \sum_{i=0}^{k} \alpha_{6i}\Delta DSR_{t-I} + \sum_{i=0}^{k} \alpha_{7i}\Delta LBF_{t-I} + \sum_{i=0}^{k} \alpha_{8i}\Delta TOT_{t-I} + \sum_{i=0}^{k} \alpha_{9i}\Delta INF_{t-I} + \sum_{i=0}^{k} \alpha_{10i}\Delta RER_{t-I} + \delta_1 GDPGR_{t-I} + \delta_2 INVG_{t-I} + \delta_3 HKt\text{-}I + \delta_4 OPENt\text{-}I + \delta_5 EDGDPt\text{-}I + \delta_6 DSR_{t-I} \delta_7 LBF_{t-I} \delta_8 TOT_{t-I} + \delta_9 INFt\text{-}I \delta_{10} RER_{t-I} + \varepsilon_{1t}$

Where, Δ is first difference operator, , 1.....10 i δ i = are long run coefficients and , 1.....10 i α i = are the short run dynamic coefficients of the ARDL model. The above model will be estimated using OLS for the purpose of testing for the long run relationship.

In order to check the significance of lagged labels of the variables an F-statistic is used for the determination of the existence of long run relationship, the null hypothesis that there is no cointegration among the variables is tested against the hypothesis that there is cointegration among the variables. That is, for equation 2:

$H_0 : \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = \delta_8 = \delta_9 = \delta_{10} = 0$

$H_0 : \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq \delta_8 \neq = \delta_9 \neq = \delta_{10} \neq 0$

If the computed F-statistics is larger than the upper bound critical value, then the null hypothesis of no long run relationship is rejected in favor of the alternative hypothesis that there exists a long run relationship. But, if the computed F-statistic is less than the lower bound critical values the null hypothesis is accepted showing that there is no long run relationship. If the computed F-statistic lies between the lower and the upper bound critical values, inference is inconclusive and we have to determine the order of integration of the regressors prior to making conclusive inference (Pesaran et al, 2001

Unit Root Test

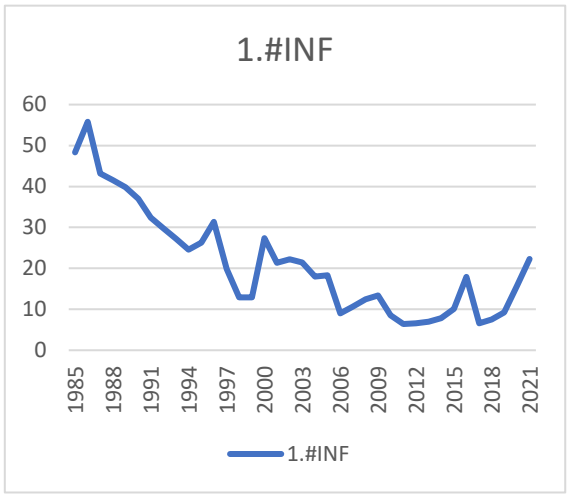
In order to determine the order of integration of the series, the Philips–Perron (PP) unit root tests are carried out. The PP test is preferred to the traditional Augmented Dickey-Fuller (ADF) test because of its use of nonparametric methods to adjust for serial correlation and endogeneity of regressors thereby preventing the loss of observations implied by the ADF test. The presence of unit root in the series indicates that the variable is nonstationary, hence the degree or order of integration is one or higher. The absence of unit root however, implies that the variables are stationary and the order of integration is zero.

Data Type and Source

The study uses annual time series data for the period 1985 – 2021 obtained from published sources. The major sources of data included World Bank‘s World Development Indicators, IMF International Financial Statistics, and African Development Indicators. Other sources included annual reports of Bank of Zambia Ministry of finance and CSO.

ANALYSIS AND DISCUSSION OF RESULTS

The trend in GDP growth rate with some of its selected determinants used in the study over the period 2014 TO 2021 is shown in the graphs displayed in the Figure below. Also shown in Table are descriptive statistics of these selected indicators for the period under study.


1.#INF
60
50
40
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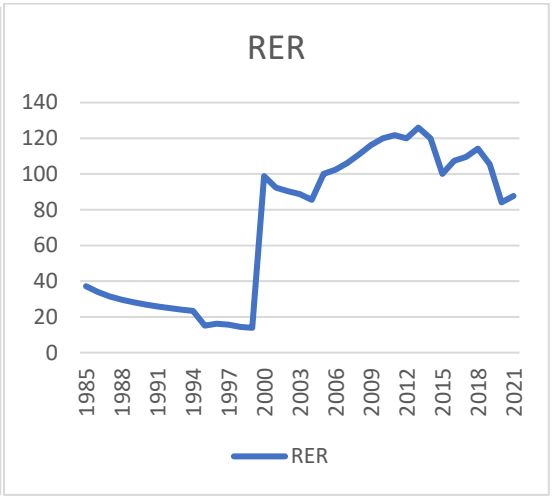
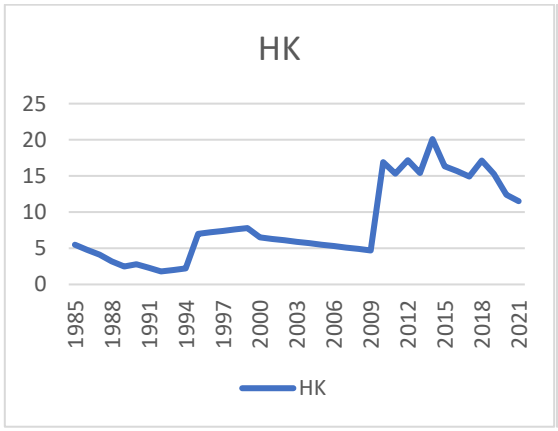
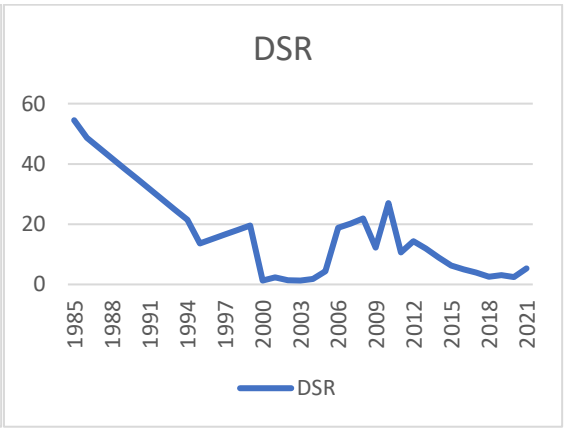
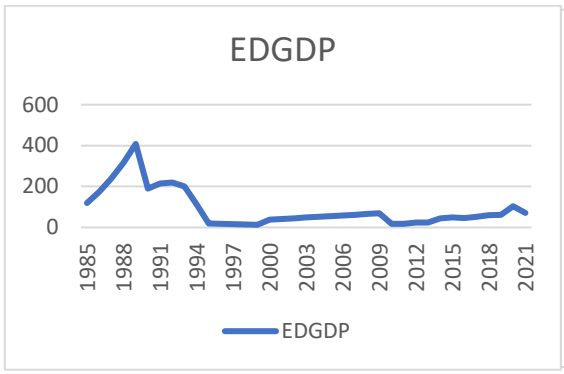
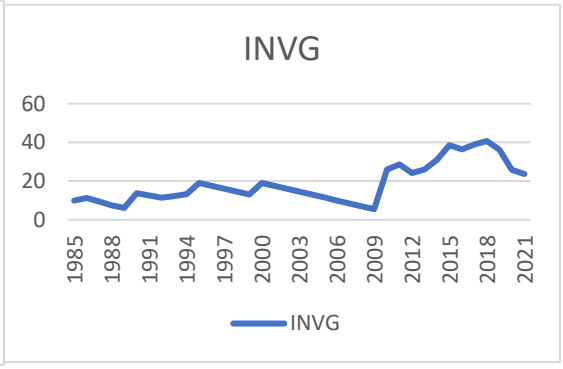
1985 1988 1991 1994 1997 2000 2003 2006 2009 2012 2015 2018 2021
1.#INF


RER
140
120
100
80
60
40
20
0
1985 1988 1991 1994 1997 2000 2003 2006 2009 2012 2015 2018 2021
RER


HK
25
20
15
10
5
0
1985 1988 1991 1994 1997 2000 2003 2006 2009 2012 2015 2018 2021
HK


DSR
60
40
20
0
1985 1988 1991 1994 1997 2000 2003 2006 2009 2012 2015 2018 2021
DSR


EDGDP
600
400
200
0
1985 1988 1991 1994 1997 2000 2003 2006 2009 2012 2015 2018 2021
EDGDP


INVG
60
40
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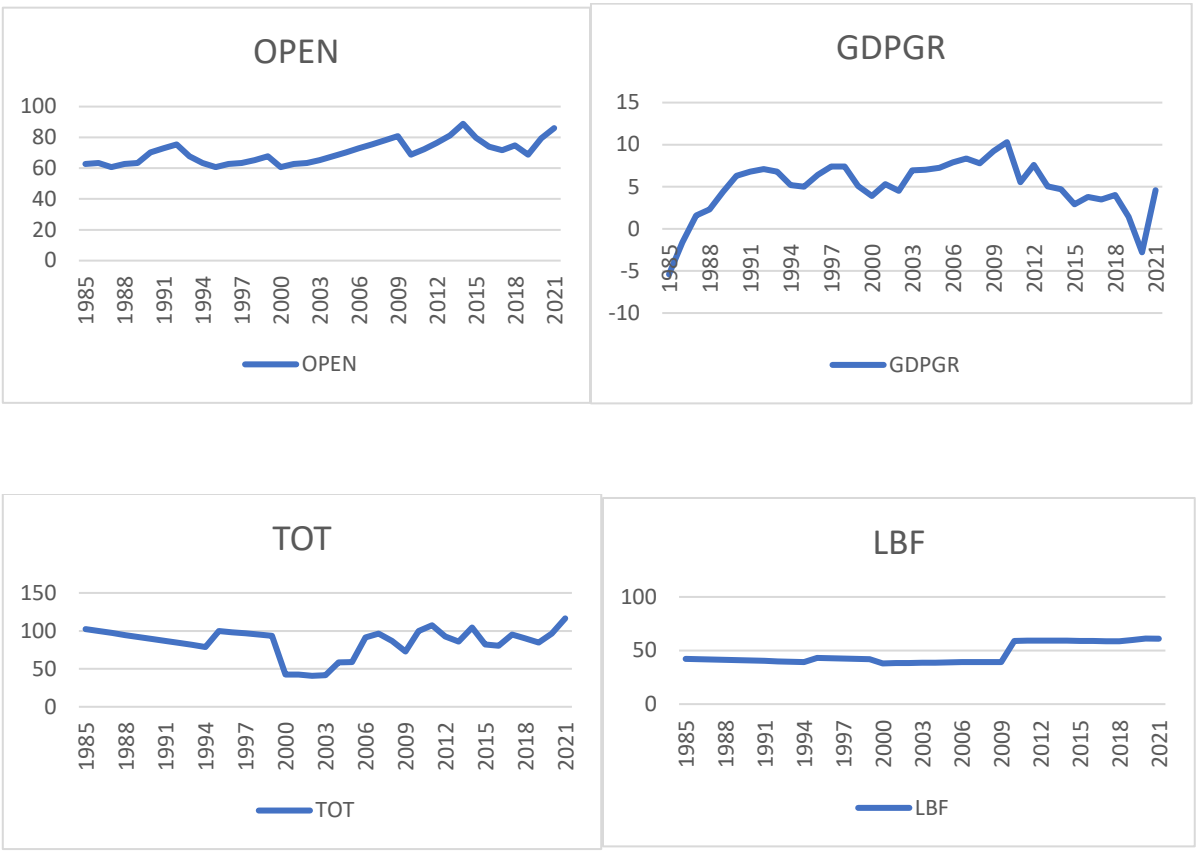
0
1985 1988 1991 1994 1997 2000 2003 2006 2009 2012 2015 2018 2021
INVG



Source: Author's Computation

DESCRIPTIVES STATISTICS OF THE VARIABLES				
INDICATOR	**MINIMUM**	**MAXIMUM**	**MEAN**	**STANDARD DEVATION**
GDPGR	-5.40	10.30	4.9645	3.22482
INVG	5.50	40.70	18.5405	10.16124
HK	1.80	20.10	8.4414	5.45406
OPEN	60.70	88.83	70.3116	7.51333
EDGDP	13.00	408.20	91.5132	92.50001
DSR	1.30	54.50	17.3108	14.80238
LBF	37.97	61.17	46.5192	9.17415
TOT	40.82	116.48	85.3346	19.14033
INF	6.40	55.80	21.1578	12.99565
RER	13.90	126.00	72.1243	41.69914

Results of the Unit root test

The results of the examination of the stationarity properties of the variables used are presented in the Table below. The test is done at both the levels and first difference models with trend and no trend. The lag length of the variables is selected based on the information criterion that offered the minimum value, which in this case was the Schwarz Information Criterion (AIC). Thus using the SIC, a maximum lag order of two (2) gave the least value and hence was selected.

Table 1 PP Unit Root Results

	Levels		First Difference		
Variable	**No Trend**	**Trend**	**No Trend**	**Trend**	**Order of Integration**
DSR	-2.756565***	-2.458104			I(0)
EDGDP	-1.491262	-2.086866	-5.934973***	-5.791224***	I(1)
GDPGR	-0.834352	-3.749409**			I(0)
HK	-0.443580	-2.534305	-7.052963***	-6.885584***	I(1)
INF	-1.832853	-1.805776	-6.563902***	-7.471809***	I(1)
INVG	-0.313556	-2.079215	-5.264157***	-5.131507***	I(1)
LBF	0.784760	-1.919761	-5.721947***	-5.808019***	I(1)
OPEN	0.631565	-2.735334	-5.424782***	-5.382048***	I(1)
RER	-0.154984	-1.713140	-6.154631***	-6.070359***	I(1)
TOT	-0.289849	-2.167843	-5.882401***	-5.857843***	I(1)

Source: Author's Computation

The results show that GDPGR and DSR are stationary at the levels, hence, I(0) when the test is is done with a trend for GDPGR and no trend for DSR. This is because the absolute values of the test statistic for GDPGR and DSR are greater than the absolute values of the critical values at 1 per cent in both cases, implying rejection of the null hypothesis of unit root and hence, non-stationarity against the alternative hypothesis of no unit root, implying stationarity. All other variables are I(1) at 1 per cent level of significance, irrespective of whether the test is done with trend and intercept or intercept but no trend. Therefore, it can be concluded the series adopted for the study are mean reverting; implying shocks are temporal, remaining at most after first differencing.

Analysis of Estimation Results

The study estimates long-run results using the ARDL approach. The results are provided in the Tables below.

Table 2 Results of the Estimated Long Run Coefficients Using the ARDL Approach

Regressor	Coefficient	Standard Error	T-ratio	Probability
INVG	-0.591040	0.580295	-1.018517	0.3246
HK	0.790588	1.038602	0.761204	0.4583
OPEN	0.167039	1.532527	0.108996	0.9147
EDGDP	-0.542797	0.297440	-1.824898	0.0880*

DSR	-0.011268	0.202952	-0.055522	0.9565
LBF	-2.684662	2.073895	-1.294502	0.2151
TOT	0.748656	0.698175	1.072304	0.3005
INF	0.203638	0.254274	0.800861	0.4357
RER	0.458156	0.199659	2.294692	0.0366

*Significant at 10% Source: Author's Computation

Most of the variables considered in the determination of economic growth have their hypothesized signs. The coefficient of current debt flows (EDGDP) is found to be negative. The value of the coefficient of EDGDP is -0.542797, which depicts that a 1 percent increase in EDGDP will bring about 54.3 percent decrease in the output growth rate. The negative state of this variable supports the Classical view on debt, that government borrowing will have a negative impact on the national economy. This result also confirms the existence of the crowding out theory and debt overhang theory of Krugman (1989) in Zambia. This theory indicates that a rise in accumulated debt stock results in higher tax on future output and thus crowds out private investment and retard growth. Furthermore, the study corroborates the studies of Iyoha (1999), Elbadawi et al (1996) and Akram (2010).

The long run value of the DSR is -0.011268. The shows a negative effect of debt service ratio as a percentage of exports on economic growth. However, it has been argued that actual debt service payments are inadequate indicators of the debt burden (Fosu 1999). The p value is not statistically significant. Nevertheless, the debt service ratio for Zambia has not been overly high compared with other low-income countries.

Trade openness is found to have a positive impact on economic growth in the long run. This is in line with apriori expectations. Zambia's trade contributes positively to economic growth. A one percent increase in trade openness increases output in the long run by 0.748656 percent.

The variable human capital shows a positive effect on economic growth in the long run. The result implies that human capital is an important determinant of output although it is insignificant.

Labour force participation is found to have negative impact on economic output growth. This was not in accordance with prior expectations. A one percent increase in Labour force participation as a percentage of total population decreases output growth rate by 2.68 times.

The negative coefficient of INVG may imply that wear and tear on public goods or government capital goods in the face of poor maintenance culture makes them growth-inhibiting in the long-run.

Diagnostic tests

To ascertain the goodness of fit of the ARDL model, its applicability and inference in policy making, there is the need to consider its statistical properties by conducting diagnostic and stability tests. The essence of the diagnostic test is to examine the heteroscedasticity, normality, functional form, and serial correlation associated with the model. The stability test of the coefficients is conducted by employing the cumulative sum of the recursive residuals (CUSUM). We graph the cumulative sums (CUSUM) of the recursive residuals from the regression. Each graph includes a 95 percent confidence band. The results reported in Table 5.6, suggest that the model was well specified and stable over the study period.

Table 3 Diagnostic Test Results

TEST	TEST STATISTIC	PROBABILITY
Serial Correlation		
Breusch-Godfrey LM test for autocorrelation	0.296959	0.5792
Heteroscedasticity		
Breusch-Pagan	1.804516	0.1628
Normality		
Jarque-Bera statistic	2.451102	0.293596

Source: Author's Computation

Serial correlation tests were conducted, and all associated p-values exceeded the 0.05 significance level, suggesting the absence of significant serial correlation in the residuals. There is no significant evidence of overall heteroscedasticity in the residuals based on the Breusch-Pagan test at the 0.05 significance level. Since the p-value (0.1628) is greater than 0.05, provides little evidence to warrant the rejection of the null hypothesis. Therefore, the assumption of homoscedasticity (constant variance of residuals) is not violated, and the variance of the residuals is roughly constant across observations. In addition, the Jarque-Bera statistic confirms that the residuals are normally distributed.

CONCLUSIONS

The objective of this research was to assess the influence of external debt on the economic growth of Zambia. The findings validate the existence of an inverse correlation between economic growth, as measured by Gross Domestic Product (GDP), and the proportion of external debt relative to GDP, as well as the percentage of GDP allocated to servicing external debt. Based on the findings, it can be inferred that the impact of external debt stocks on economic growth is greater than that of debt servicing on external debt. The reason for this phenomenon can be attributed to the fact that the ratio of external debt to GDP had a larger value compared to the ratio of debt service on external debt. The increasing ratio of external debt to GDP acts as a deterrent for investment, since investors predict that the government would implement greater taxes and other unfavorable policies in order to repay these loans. As a consequence, the deferment of investment plans has had an impact on the country's economic growth. Debts are widely regarded as imposing a burden on future generations, akin to a form of taxation, which consequently serves as a deterrent to investment. This observation implies that Ghana is confronted with a challenge of excessive debt burden.

Likewise, the growing burden of interest payments on external debt has had an impact on the trajectory of economic growth. The increasing ratio of debt service on external debt to GDP implies that the nation is allocating a greater proportion of its resources towards the payment of interest on its debt. The reduction in available resources hampers the ability to carry out development initiatives, leading to a decrease in economic growth. This also implies that Zambia may be experiencing a phenomenon known as debt crowding out.

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