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Effects of Public Debt on Economic Growth: An Empirical Evidence from Zambia (2011-2021)

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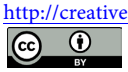

Abstract

Understanding the effect of public debt on economic growth in a country is vital for macroeconomic strategy groundwork and analysis as well as maintaining monetary policies that activate progress and growth. The purpose of this study was to analyse the effects of public debt on economic growth in Zambia from 2011-2021. The researcher employed Microsoft Excel and E-Views to analyse data. The Autoregressive distributed lags model (ARDL) estimates are assumed to be relevant in the long-run, and can be used to explain a long-run correlation between variables. It is especially useful for describing the dynamic behaviour of economic time series and forecasting. The study estimated the ARDL comprising Prime Lending Rate, Exchange Rate, External Debt Stock and Domestic Debt Stock as well as the dependent variable Real Gross Domestic Product. The variables incorporated in the econometric model were; Prime Lending Rate, Exchange rate, External Debt Stock and Domestic Debt Stock. The results from the econometric model revealed that these factors have had a significant impact on economic growth in Zambia from 2011-2021. The results of this study imply that policy makers should ensure that Zambia borrows for production and not for consumption. Borrowing for production would increase Gross Domestic Product (GPD) and consequently real GDP. Thus, the debt would have a positive impact on the economy. There is need for Policy makers to earnestly embark on coming up with a consistent macro-economic database to back more research essential to offer policy guidance.

Keywords

Economic Growth, Exchange Rate, External Debt Stock and Domestic Debt Stock

1. Introduction

When a country's revenue falls short of its expenditure, governments are asked to borrow. Public debt both External and Domestic, is a tool used by government to access funds for public spending, particularly when it is difficult to raise taxes and reduce expenditure (Aizenman & Ito, 2020).

This practice of borrowing money has left most governments with enormous amounts of outstanding debt over time. Economic growth depends heavily on reasonable borrowing used to fund infrastructure development; nevertheless, excessive borrowing without proper investment planning can result in high debt loads and interest payments, which can have a number of negative consequences on the economy (Joy & Panda, 2020).

This study looks at Zambia's public debt and how it affects the country's economic expansion. Time series data spanning the years 2011 to 2021 was used in a comprehensive empirical analysis to adequately reflect its impact on the economy.

Effects of Public External Debt on the Growth of the Country

The patterns in the public debt analysis indicate that Zambia's governmental debt accumulated mostly as a result of external debt. The economic crisis of the 1970s, had a significant impact on Zambia's economy, namely on the export sector, and therefore increased the country's debt stock (Muleya, 2022). The nation is now fighting to maintain economic growth and combat poverty. Inflation as of September 2021 was 22.1%, over the nation's medium-term goal range of 6 to 8% (MOF, 2022).

H0: External debt has no impact on economic growth in Zambia.

H1: External debt has an impact on economic growth in Zambia.

Effects of Public Domestic Debt on the Growth of the Country

Presently, Zambia's external debt is less than its domestic debt, which makes up around 53% of the country's overall public debt. The composition of the public domestic debt over the analysis period was found to be lower than the external debt, notwithstanding a notable increase in 2013 and after (MOF, 2022). Operationally speaking, the total amount of debt the government owes domestic businesses is known as the public domestic debt. All outstanding payments for Treasury Bills and Government Securities are included in this total debt (Phiri, 2022). Muleya (2022) stated that the policy of rolling over, which required capitalization of principle and interest and increased borrowing to pay foreign debt service obligations and budgetary programs, was primarily to blame for the rise in the stock of public domestic debt. The domestic debt status as of the end of September 2021 totaled K46.7 billion. The amount of domestic debt raised by the issuing of government securities from K130.2 billion to 189.7 billion is mostly attributable to COVID-19 costs and Farmers Input Support Program (FISP) subsidies (MOF, 2022).

H0: Internal Public debt has no impact on economic growth in Zambia.

H1: Internal Public debt has an impact on economic growth in Zambia.

Relationship between Exchange Rate and Economic Growth of the Country

The amount of external debt in terms of local currency will rise in response to an appreciation in the foreign currency that the debt is denominated in. In this regard, IMF (2022) records that the Zambia's Kwacha devaluation between the end of 2018 and the end of 2021 caused its foreign debt to soar from $9.68 billion to $22.64 billion (a substantial 137.29% rise).

H0: Exchange rates have no impact on economic growth in Zambia.

H1: Exchange rates have an impact on economic growth in Zambia.

2. Background

2.1. The Growth of Debt

The Government of the Republic of Zambia (GRZ) has consistently used borrowing, both domestically and internationally, as a crucial component of resource mobilization to close the budgetary financing gap. With the exception of the 2011 budget, which set borrowing both locally and externally at 3% of GDP, the government's borrowing has been limited to 2% of GDP over the previous five years (Muleya, 2022).

Zambia's debt increased to such a level in the late 1990s that it was nearly impossible for Zambia to pay back its debt. As a result, the nation was designated as a Highly Indebted Poor Country (HIPC) (Baker et al., 2016). The Government launched a strong campaign in reaction to this, under the Jubilee 2000 and further requested debt remission or forgiveness. Zambia was able to achieve the IMF/World Bank's HIPC completion point as a consequence (from over USD 7.1 billion in 2004 to USD 502 million in 2006) (Muleya, 2022).

After years of rapid development in the early 2000s, the World Bank classed the nation as a lower middle-income country in 2007 as a result of the government's ability to free up resources and resume its upward economic trajectory (Chongo, 2013). Currently, Zambia is deeply indebted despite having benefitted from the HIPC debt reduction in the early 2000s due to heavy borrowing since 2011. One explanation offered is the change in the global financial systems, which gave poor nations like Zambia greater room to borrow money from private financial sources and commercial markets as opposed to traditional bilateral and multilateral lending organizations (Muleya, 2022).

Following Zambia's irreversible debt reduction from its bilateral and multilateral creditors under the Enhanced HIPC Framework Initiative and multilateral debt relief initiative (MDRI), the country's public foreign debt stock fell precipitously from US$7.2 billion to US$1.1 billion in 2006.

2.2. Problem Statement

It has been argued that public debt affects economic growth of any country either in a positive or negative way (Kim et al., 2017). Zambia, like most highly indebted poor countries, has low economic growth and low per capita income

with insufficient domestic savings.

The country has undertaken various developmental projects with the aim of improving the welfare of its citizens and promoting economic growth and development. However, to finance these projects, the country has to acquire extra funds in the form of debt to ensure that they are all achieved. Ever since Zambia's independence in 1964, there has been an accumulation of debts aimed at various developmental projects without expected results (Muleya, 2022). It is no exaggeration that this is a major challenge faced by the Zambian economy.

As at end-June 2021, Zambia's total public debt both external and domestic was USD equiv. 26.44bn excluding interest arrears, and USD equiv. 26.96bn including interest arrears with little to no economic growth. Over the past few years Zambia has been seeking a bailout from IMF and a staff level approval granted (Phiri, 2022) this has led to the removal of subsidies and has had an effect on public and private investments.

Although there is substantial literature on the impact of public debt on economic growth, most of these have employed cross country studies, which have been criticized for ignoring the heterogeneity among economies (Elbadawi et al., 2019). Developing countries differ significantly in terms of their economic and political environment, organization and institutions, hence the need for specific country study to ascertain the association between these variables.

In the case of Zambia, public debt over the period of analysis depicts a rising trend and therefore, the country is not precluded from the implication of a rising debt stock and this has necessitated the need for an empirical analysis of the above phenomenon in Zambia.

Based on the problem of the study, the following are the objectives:

1) To assess the effect of external public debt on economic growth in Zambia.

2) To examine the effect of domestic public debt on economic growth in Zambia.

3) To determine the relationship between exchange rates and economic growth in Zambia.

3. Literature Review

The literature review was presented in line with the main concepts of the study and have been categorized into (3) categories; Global, African region and Local perspectives.

3.1. Global Perspective

Calderon and Fuentes (2013) using a panel framework investigated the relationship between debt and growth in Latin America countries over the period 1970 to 2010. The study revealed that debt has a negative impact on economic growth. Notably, they show that strong institutions, high quality domestic policies, and outward-oriented policies partly mitigate the adverse effect of debt on economic growth. In addition, the paper shows that a simultaneous sharp reduction in

public debt and an improvement in the policy environment induce an increase in the growth rate per capita of 1.7 percentage points for the Caribbean and 2 percentage points for South America. Using an auto regressive distributed lag (ARDL) approach, Akram (2011) examined the impact of public debt on economic growth and investment in Pakistan for the period 1972-2009. He finds that the public external debt has a negative relationship with per capita GDP and investment in Pakistan, confirming the existence of a debt overhang effect.

Fauzia (2013) conducted a study aimed at investigating the impact of government spending on economic performance in the United States of America. He concluded that a large and growing government is not conducive to better economic performance. He also noted that indeed, that there are circumstances in which lower levels of government spending would enhance economic growth and other circumstances in which higher levels of government spending would be desirable. Aizenman and Ito (2020) find interaction effects between deficits and debt stocks, with high debt stocks exacerbating the adverse consequences of high deficit.

3.2. African Region

Umaru et al. (2013) also applied the OLS technique using time series data to examine the impact of external debt on economic growth and public investment in Nigeria from 1970-2002. The debt service burden was said to impede the Country's rapid economic development and worsened the social problems. Ncanywa and Masoga (2018) also explored the impact of high public debt on economic growth in the long term. They base their analysis on a range of advanced and emerging economies during the period from 1970 to 2007. The empirical results suggest an inverse relationship between initial debt and subsequent growth.

Onafowora and Owoye (2019) argued that, an important channel through which public debt accumulation can affect growth is that of long-term interest rates. Higher long-term interests resulting from more debt financed government budget deficit, can crowd out private investment, thus dampening potential output growth. Indeed, if higher public financing needs push up sovereign debt yields, this may induce an increased net flow of funds out of the private sector into the public sector. This may lead to an increase in private interest rates and a decrease in private spending growth, both by households and firms. Adi (2019) studied the impact of public debt on economic growth in Ghana from 1965 to 2017 using descriptive statistics and multiple regressions in the main data analysis. The study used controlling variables such as population growth, government expenditure, inflation, trade openness and government intervention using ordinary least squares (OLS) model with robust standard errors. He concluded that public debt had a positive impact on economic growth in Ghana.

3.3. Local Perspective

In the case of Zambia, the study undertaken by Chikuba (2003) focused only on

public external debt effects on growth from 1970 to 1999. The study concluded that there was crowding out of investment in Zambia due to the presence of debt overhang. The study applied the two-stage-least squares regression approach and OLS to estimate the growth and investment model respectively. The two-stage-least squares technique was applied to caterfor endogeneity problem between the debt and growth variables. Like other studies so faranalysed in this section, his results were valid and consistent with theoretical arguments, however the methodology did not state the direction of causation effect.

Further, the study undertaken by Chikuba (2003) did not consider the effects of public domestic debt on growth, despite being on the increase. Chongo (2013) further studied the influence of rising public debt on Zambia's economic development between 1980 and 2008 in order to provide policy recommendations, and examined the three main ways that public debt is thought to affect economic growth using the following variables: domestic savings, public savings, and private investments.

This study has filled in this information gap by analysing the short and long run economic growth effects of a rising public debt stock (both external and domestic public debt) in Zambia covering both the pre and post HIPC periods from 1980 to 2021. A further contribution by this study is the analysis of the short and long run impact of public debt on the empirical determinants of economic growth which is important for policy guidance.

4. Theoretical Framework

A theoretical framework is a basic overview of ideas that already exist and acted as a guide for this research.

4.1. The Debt Overhang Theory

External borrowing is covered with the perceived negative relationship between foreign debt and investment which consequently results into lower capital formation. Krugman (1988) defines this negative relationship as "debt overhang" where the potentials of repayment of outstanding facilities fall lower than the signed value. Several scholars have supported the theoretical case for debt overhang. Some of the studies include Krugman (1988) and Sachs (1988). Others like Green (2003), Chowdhury (2004) and Mbali (2021) reaffirmed this by coming up with ample proof that backs the debt overhang phenomenon.

4.2. The Dual Gap Theory

The dual gap model propounded by Chenery and Strout (1966) underscores that indebtedness is associated with an imbalance, and depending on the case, it is the imbalance between savings and investment, and the budget deficit and the current account deficit. Thus, external borrowing becomes a necessity. The most important consideration in contracting external debt is a simple and direct one; signing up for debt from abroad only when the funds can generate higher re-

turns than the cost of funds when invested.

4.3. Crowding Out Effect

Keynes (1919) states that a crowding out effect is a situation when increased interest rates lead to a reduction in private investment spending such that it dampens the initial increase of total investment spending. Sometimes, government adopts an expansionary fiscal policy stance and increases its spending to boost the economic activity (Chewe, 2009). This leads to an increase in interest rates. Increased interest rates affect private investment decisions. A high magnitude of the crowding out effect may even lead to lesser income in the economy.

5. Conceptual Framework

Saungweme and Odhiambo (2019) asserted that the conceptual framework puts the stage for the demonstration of study enquiries founded on the theme under study. The Conceptual Framework (Concepts Statements) is a frame of interconnected goals and nitty-gritties. Mwale (2012) proclaims that a conceptual framework embodies the investigator's amalgamation of collected works on how to elucidate a phenomenon. It maps out the activities essential in the progression of the research given the preceding information of other scholars' viewpoint and investigator's opinions on the topic. The conceptual framework connects the independent variables to dependent variable in **Figure 1**.

6. Methodology

Based on the research questions and the problem at hand, this research adopted a quantitative research study approach.

6.1. Research Design and Approach

This study used time series data from 2011 to 2021. Time series data made it possible to analyze the change and developments over the stated period of time.

The Autoregressive distributed lags model (ARDL) model was used in the study. The model was formulated using GDP as the dependent variable while the

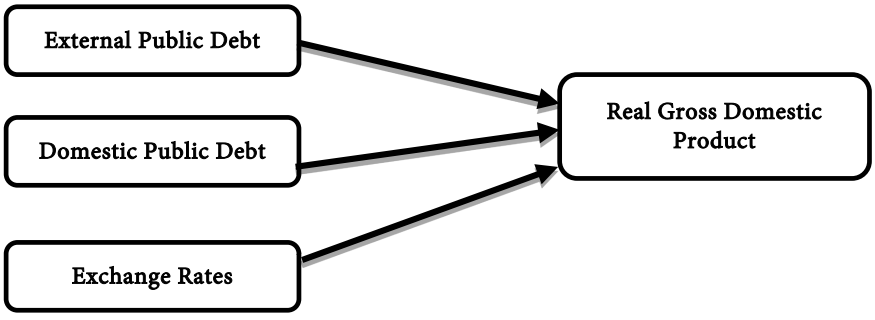

Figure 1. Conceptual framework (Author, 2023).

explanatory variables were Domestic Debt stock, External Debt Stock and Exchange Rate. Prime Lending Rate was used as a control variable. The equation can be defined econometrically as below:

$$\text{RGDP} = \alpha_0 + \alpha_1 \text{EXD} + \alpha_2 \text{DMD} + \alpha_3 \text{EXR} + \alpha_4 \text{LR} + u_i .$$

where; α_0 = a constant;

α_1, α_2, α_3, α_4 = coefficient of the independent variables;

RGDP = Real Gross Domestic Product;

LR = Prime Lending Rate;

EXR= Exchange rate;

EXD = External Debt Stock;

DMD = Domestic Debt Stock;

u_i = error term.

Explanatory variable	Expected sign
External Public debt	−
Domestic Public debt	−
Lending rates	+
Exchange rate	+

Source: Author (2023).

6.2. Population and Sampling Design

The study consisted of 120 monthly observations from January 2011 to December 2021. This sample size was sufficiently enough to generalize from the findings. Besides, this was the most recent data.

6.3. Data Collection

Secondary data was used for the study. Secondary data refers to data that is collected by someone other than the primary user. Common sources of secondary data for social science include censuses, information collected by government departments, organizational records and data that was originally collected for other research purposes (Johnston, 2014). Secondary data for this study was collected for this study was secondary data from sources such as the IMF sites and Bank of Zambia.

Validity and Reliability of the Data Collection Instrument

This research study used secondary data that is readily available and was assembled by competent institutions, something that enhanced the reliability and validity of this study.

6.4. Data Analysis

Statistical Package for Social Sciences (SPSS) was employed to analyse the data. The research also employed Microsoft Excel and E-Views to analyse data. The Autoregressive distributed lags model (ARDL) estimates were assumed to be re-

levant in describing the dynamic behaviour of economic time series and forecasting in the short and long-run to explain the correlation between variables.

6.5. Ethical Consideration

Data collection has to follow stipulated ethical measures, protect and maintain the interest both the researcher and the researched at all times (Kim et al., 2017) Ethical considerations are important because they ensure that there is fairness in the manner in which the research is conducted. Therefore, informed consent was provided and permission sought from the University of Zambia was obtained to proceed with the study.

7. Data Analysis and Presentation

This research investigated the impact of public debt on economic growth in Zambia from 2011-2021. The purpose of this research was attained by examining the correlation between each of the explanatory variables (Prime Lending Rate, Exchange rate, External Debt Stock and Domestic Debt Stock) and the dependent variable (Real Gross Domestic Product).

7.1. Descriptive Statistics

Table 1 present some key summary statistics on the major variables of interest in this research which are Prime Lending Rate (LR), Exchange rate (EXR), External Debt Stock (EXD) and Domestic Debt Stock (DMD) and Real Gross Domestic Product (RGDP). This relates to time series observation of a 10-year period from 2011 to 2021.

The RGDP has an average of 0.3226 and a standard deviation of 0.1134. This illustrates how close the observations are to the mean. RGDP has a platykurtic distribution. However, the EXD is leptokurtic, it can be described as having a wider or flatter shape with fatter tails resulting in a greater chance of extreme positive or negative events (Cordella et al., 2005) Because of this, EXD has a lower chance of experiencing outliers than the RGDP and thus had a negative effect on the time series under observation.

Table 1. Descriptive statistics.

	RGDP	EXD	EXR	LR	DMD
1. Mean	0.3226	0.5446	0.6446	0.1446	0.3441
2. Median	0.4928	0.2789	0.3789	0.0586	0.3783
3. Maximum	0.9245	0.9876	0.9875	0.15871	0.9171
4. Minimum	0.2113	0.1476	0.1146	0.0676	0.1572
5. Std. Dev	0.1134	0.3468	0.3461	0.7468	0.3132
6. Skewness	0.6119	0.7568	0.7568	0.8561	0.6668
7. Kurtosis	2.8873	3.8677	1.8677	3.5350	3.2271

Source: Author (2023).

The EXD has a low standard deviation of 0.3468. This describes how close the values of EXD are to the mean of 0.5546. In comparison to the RGDP standard deviation, the EXD has a higher variability. Both the RGDP and the EXD are moderately skewed to the left. This describes a moderate chance of having outliers in the time series analysis. In the analysis the EXD was an outlier due to economic shocks that happened during the COVID-19 pandemic that also led to Zambia defaulting to pay back debt.

The EXD and the DMD have relatively similar standard deviations. This shows how similar their dispersions are. They are both positively skewed. However, the DMD distribution has a less peaked distribution and hence more prone to outliers due to the fatter tails in the distribution. On DMD, according to a notion known as the "crowding out effect", higher government spending eventually results in lower private sector spending. This is because when the government raises taxes or borrows money by selling Treasuries to fund its own spending, it may lead to increased loan costs and lower income. During the time under analysis the government utilised DMD because a debt overhang was reached, this is detrimental and affects the economy's RDGP (Blanchard, 2019).

The EXR distribution has a platykurtic distribution meaning an excess kurtosis value in a statistical distribution that is negative (Gujarati et al., 2009). Therefore, less severe positive or negative events would occur in a platykurtic distribution due to its thinner tails than in a normal distribution. The EXR kurtosis being 1.8677 was an outlier as all other variables were close to the value of 3. This shows that exchange rate fluctuations can impact the economy negatively or positively depending on the economy's currency bargaining power. Hence the conclusion that there is a relationship between exchange rate fluctuation and economic grow due to the EXR volatility caused by external shocks beyond the control of a government.

The RGDP and the DMD are approximately at value 3 for kurtosis (mesokurtic) and moderately skewed to the left. Therefore, more prone to outliers. Because of this, the possibility of distortion in the mean is higher. This means that any changes in DMD can heavily affect an economy's RDGP.

The EXD is skewed to the left (positively skewed) but is leptokurtic, hence thinner tails and hence a lower chance of outliers (lower possibility of mean distortion). The DMD distribution does not follow the order of a positively skewed distribution (the median is greater than the mean) and so this results in the dependent variable having similar distortion. This shows that EXD and DMD affect RDGP especially in the times of global economic shocks.

The LR has a mean of 0.1446. It has a relatively high standard deviation of 0.7468. This entails a higher variability among its observations. Also, it is positively skewed. It is leptokurtic and so less prone to outliers. It follows then that the mean has a low possibility of being distorted. The LR was used as a control variable as it is under government control.

The aforementioned observation highlights the low economic growth between 2011 and 2021 as well as the upward trend in debt for both domestic and exter-

nal. This suggests that resources from the economy's expansion would be diverted to debt servicing of debt such as the Eurobond which was also acquired during the time under analysis. If the debt is not serviced this will lead to debt increasing due to interest on debt and new debt being costly as the exchange rates continue to increase at a rapid rate.

7.2. Unit Root Tests

Table 2 Augmented Dickey Fuller (ADF) Tests was employed to test whether the variables have a unit root at 1 per cent level of significance whereas the Zivot Andrews (ZA) Unit root with structural break test was engaged to check for structural break in the variables with unit root. The results were as follows at 0.05 or 5 per cent level of significance

These results show that none of the variables are integrated of order 2 and that certain variables are stationary at level or I(0) although others are stationary only after taking the first difference or I(1). Consequently, there is statistical proof in support of using the Autoregressive distributed lags model (ARDL) model instead of the Vector error correction model which needs the same order of integration. Additionally, only one variable was found to have a significant structural break at 5 per cent level of significance as presented in Table 3.

7.3. ARDL Model Short-Run Estimations

Table 4 below depicts that shocks in any of the model's variables can cause short-term departures from the long-term equilibrium. According to Chongo (2013), all of the short run coefficients so demonstrate how each variable dynamically adjusts to its long run equilibrium. With a few exceptions, the signs of the coefficients in the short-run model were similar to those found in the long

Table 2. ADF unit root test results.

1. RGDP	−2.2767**	−7.6205***	1	I (1)
2. EXD	−0.0134	−5.9758***	0	I (1)
3. EXR	−0.5782	−5.9853***	0	I (1)
4. LR	−0.2987	−8.4318***	1	I (1)
5. DMD	−0.8559	−8.6240***	0	I (1)

P-values of Coefficients: ***$p < 0.01$, **$p < 0.05$ and *$p < 0.1$.

Table 3. Zivot-Andrews unit root and structural break test results.

1. RGDP	−6.132***	2000	No Structural Break
2. EXD	−3.647**	2001	No Structural Break
3. EXR	−4.130***	1999	No Structural Break
4. LR	−2.978*	1998	Structural Break
5. DMD	−3.805***	2004	No Structural Break

P-values of Coefficients: ***$p < 0.01$, **$p < 0.05$ and *$p < 0.1$.

Table 4. ARDL model short-run results.

Variable	Coefficient	Std. Error	t-Statistic	
	Prob.*YG(−1)	−0.42654**	0.124474	
3.42671	0.0187			
1. RGDP	0.310581**	0.607293	2.897776	0.1173
2. RGDP(−1)	0.071050	0.30039	1.419898	0.4129
3. EXD	−1.776742***	0.117624	8.7831	0.0003
4. EXD(−1)	−0.85742**	0.211665	−2.65693	0.0450
5. EXR	4.665475***	2.421181	6.107451	0.0017
6. EXR(−1)	10.06891***	1.83407	−4.65048	0.0056
7. LR	0.079995	0.04237	0.344807	0.7553
8. LR(−1)	0.090791***	0.053169	4.847546	0.0557
9. DMD	−0.09987***	0.015333	4.649998	0.0336
10. DMD(−1)	−0.44012**	0.06531	3.729422	0.0216

Source: Author (2023).

run model. The short-term outcomes demonstrate that EXD promotes economic expansion. An increase of one percent in EXD corresponds to a 1.776 percent rise in economic growth. This is hardly a surprising outcome. The implication is that growth is likely to occur eventually if external debt is utilized to support growth-enhancing spending, such as capital spending (such as infrastructure). Ultimately, debt is not always a bad thing because certain debt levels can be permitted in order to promote growth (Lungu et al., 2020).

In the short run, it is discovered that the variable LR, which is utilized as a stand-in for rate fluctuations, has a positive and significant impact at the 1% level of significance. According to the variable's coefficient, a 1% increase in LR will cause a 0.33% increase in RDGP. The outcome is in line with the conclusions of Amandeep (2015) about India, Umaru et al. (2013) regarding to the country of Nigeria.

Short-term economic growth is found to be adversely correlated with the lending rates variable expressed as a percentage of public debt. Economic growth is reduced by 0.07 for every 1% increase in public debt. By lowering productivity, debt payments directly impede production growth. The one percent significance level for this variable is reached. Significant debt obligations take money and foreign exchange away from internal investments and toward principle and interest payments. A nation's credit is impacted when its government is unable to pay off debts on time, and if this issue continues, the country may eventually find it difficult to borrow money for new initiatives.

Short-term growth output is negatively impacted by both domestic and external public debt. That being said, this outcome is very noteworthy. As anticipated, improvements in capital inflows, have a major and beneficial short-term influence on economic growth output. While historical lending rates hindered economic growth, the current lending rates foster it.

It is noteworthy that the expected sign is present in the statistically significant in the ARDL short-term model. The rationale for this is that, at the one percent significance level, ARDL is statistically significantly above the threshold. ARDL at 0.310581 is greater than the critical value and thus implies that the null hypothesis of short-term relationship is rejected at 1 percent level of significance.

7.4. ARDL Cointegration and Long-Run Form

Cointeq; RGDP = 2.548179 − 0.86867EXD + 1.685851EXR + 0.087442LR − 0.5986554DMD.

This equation has been produced founded on the above ARDL model and the cointegrating term is then used as a variable in the cointegrating form of the model. The cointegrating form captures the long and short-run dynamics of the ARDL model and is consequently an error correction (Daka et al., 2017).

The majority of the factors considered when calculating economic growth have the predicted indications. It is discovered that the current debt flows coefficient EXD is negative. The output growth rate will decrease by 0.86867 percent for every one percent increase in EXD, according to the coefficient of determination, which has a value of −0.86867. The fact that this variable is negative lends credence to the classical theory of debt, which holds that government borrowing would harm the country's economy. The crowding out and debt overhang theories of Krugman (1988) are also supported by this conclusion in Zambia. According to this hypothesis, an increase in the stock of accumulated debt raises taxes on future production, which discourages private investment and delays. Furthermore, the study corroborates the studies of Mukui (2013), Ndoricimpa (2017) and Phiri (2022).

The EXR's long-term value is 1.685851. It was unexpected that the exchange rate ratio as a percentage of public debt had a favorable impact on economic growth. On the other hand, some contend that real debt service payments are not a reliable measure of total debt (Blanchard, 2019). The supremacy of debt relief over debt service payment is the reason for the favorable association. However, as compared to other low-income nations, Zambia's debt servicing percentage has not been unduly high.

DMD were found to have a negative impact on economic growth in the long run. This is in line with apriori expectations. Zambia's domestic debt contributes negatively to economic growth with a decrease of −0.5986554. The fact that this variable is negative lends credence to the classical theory of debt, which holds that government borrowing even from its own internal sources could harm the economy in the long run. This was the same with the finding of Bal and Rath (2014).

Over time, the variable lending rates has a favorable impact on economic growth. The outcome suggests that, despite its small size of 0.087442, lending rate is a key factor in determining output. The output growth rate increases by 0.1 per-

cent for every one percent increase in lending rates.

The findings in Table 5 were as indicated by the above threshold coefficient of 0.05 of RDGP which was 2.548170. Since both DMD and EXD had a *p*-value greater than 0.05, consequently the null hypotheses have been rejected and we assume that these variables have a negative effect on economic growth in a developing nation like Zambia.

7.5. Summary of Hypothesis Testing

Table 6 shows that there was a correlation between the variables being investigated and that all three of the proposed hypotheses were validated.

8. Discussion

The findings of the study showed a negative and significant relationship between RDGP and external public debt. These findings are consistent with Adi (2019) who found that public debt had a negative impact on economic growth in Ghana. Most of the variables considered when estimating economic growth show the expected trends. It is found that the coefficient of current debt flows (EXD) is negative. The coefficient of determination, which has a value of −0.86867, indicates that for every one percent increase in EXD, the output growth rate will decrease by 0.86867 percent. The negative value of this variable supports the debt overhang theory by Krugman (1988), which maintains that borrowing by the government would be detrimental to the nation's economy. The result of the research showed that external public debt had a significant and negative relationship

Table 5. ARDL cointegration and long-run form results.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
1. RGDP	2.548170***	0.374154	4.450489	0.0067
2. EXR	1.685851	1.545641	1.860877	0.1711
3. EXD	−0.86867	0.0221343	2.56478	0.0495
4. LR	0.087442**	0.400811	3.589694	0.0124
5. DMD	−0.5986554**	0.066957	2.785694	0.0386

P-values of Coefficients: ***$p < 0.01$ and ** $p < 0.05$.

Table 6. Hypotheses testing.

	Hypotheses	*P* Value	Comment
H1	There is a negative and significant relationship between RDGP and external public debt	0.05	Support
H2	There is a negative and significant relationship exists between RDGP and domestic public debt.	0.05	Support
H3	There is a positive and significant relationship with exchange rate.	0.05	Support

Source: Author (2023).

with real economic growth especially on developing countries, as for the case with developed countries have mixed outcomes most bordering on external debt having a good impact on their economies (Aizenman & Ito, 2020).

The study established that a negative and significant relationship exists between RDGP and domestic public debt. These findings are supported by Krugman (1988), Sachs (1988), Elbadawi et al. (2019) and Lungu et al. (2020) as well as Abula and Mathew (2016) who all established that a negative and significant relationship exists between RDGP and domestic public. It was shown that DMD had a long-term detrimental effect on economic growth. This matches the assumptions apriori. Zambia's domestic debt has decreased by −0.5986554, which has a negative impact on economic growth. The dual gap theory propounded by Chenery and Strout (1966), maintains that government borrowing, even from domestic sources, may eventually be detrimental to the economy, is supported by the fact that this variable is negative. This was also the case with Bal and Rath's (2014) findings about India...

The findings revealed that RGDP has a positive and significant relationship with exchange rate. The findings are consistent with Blanchard (2019) who established that Changes in the RGDP reveal changes in economic growth and can directly impact the relative value of a country's currency. Kapindula (2019) also established that a high GDP reflects larger production rates, an indication of greater demand for that country's products. An increase in demand for a country's goods and services often translates into increased demand for the country's currency.

From the results it shows that the long-term value of the EXR is 1.685851. The exchange rate ratio's positive effect on economic growth as a percentage of public debt was unanticipated. However, some argue that actual debt service payments are an unreliable indicator of total debt (Blanchard, 2019). The positive correlation is due to the fact that debt relief is more important than paying debt service. However, Zambia's debt servicing percentage has been excessively high in comparison to other low-income countries and this is due to the currency becoming weaker by the day (Muleya, 2022). Exchange rate volatility leads to expensive payback amounts, this is supported by Keynes (1919) with the crowding out effect theory.

However, Chiliba et al. (2016) stated that in the long run, exchange rate fluctuations are not much influenced by macroeconomic fundamentals. The monetary model of exchange rate determination, which maintains that there is a long-run link between the exchange rate and macroeconomic fundamentals, is at odds with this finding (Chiliba et al., 2016).

9. Conclusion

This study looked into how Zambia's public debt affected the country's economic growth from 2011 and 2021. To analyze data, the researcher used E-Views and Microsoft Excel. The research specifically aimed to evaluate the impact of do-

mestic public debt on economic growth in Zambia, the impact of external public debt on economic growth, and the impact of exchange rates on economic growth in Zambia.

The result of the research showed that external public debt had a significant and negative relationship with real economic growth. The study also established that a negative and significant relationship exists between RDGP and domestic public debt. The findings further revealed that RGDP has a positive and significant relationship with exchange rate fluctuations. The findings are consistent with Blanchard (2019) who established that Changes in the GDP reveal changes in economic growth and can directly impact the relative value of a country's currency. These findings were also consistent with the findings of other economies similar to that of Zambia. However, the finding was different with the first world nations who are not part of the HIPC countries as most researchers agreed that public debt has a negative impact on economic growth but not as much on high income countries as they are able to service their debt easier than third world countries (IMF, 2019).

From the study conducted it was concluded that there is relationship between public debt and economic growth in Zambia and it keeps evolving due to the different macro-economic factors. Therefore, there is a non-monotonic connection between public debt and economic growth as it is not resistant to modifications in the coverage of the data or to the empirical methods used. This can also be supported in the study conducted by Fauzia (2013) who concluded that as long as macro-economic factors are at play, there will forever be a relationship between public debt and the economic growth of a country.

10. Recommendations

Policy makers should ensure that Zambia borrows for production and not for consumption. Borrowing for production would increase GPD and consequently real GDP. Thus, the debt would have a positive impact on the economy.

There is need for Policy makers to earnestly embark on coming up with a consistent macro-economic database to back more research essential to offer policy guidance on borrowing for production and not consumption

Well-organized administration of public debt figures would similarly warrant efficient estimation of results to support policy recommendation necessary to ensure that the progression of Zambia's public debt is upheld within a maintainable track.

The country needs to seriously embark on putting in place a reliable macro-economic database to support more research necessary to provide policy guidance. Efficient management of public debt statistics would also warrant efficient estimation of results to support policy recommendation necessary to ensure that the progression of Zambia's public debt is maintained within a sustainable path.

To achieve its ambitious income targets, the government must devise a robust plan for mobilizing domestic resources. Given the elevated level of debt and the

corresponding debt servicing, the government needs to ensure that expenditures in the social and productive domains are safeguarded

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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