

A study of the Effect of Taxation on Economic Growth Amidst the Debt Crisis in Zambia, 1995 - 2023

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Abstract:

In developing countries, including Zambia, the government is responsible for providing essential public goods and services such as roads, schools, and hospitals. To fulfil this mandate, governments require revenue. However, this can only be achieved through taxation as it is the most reliable, predictable, and sustainable source. Taxation not only generates revenue but also redistributes wealth from richer to poorer segments of society and addresses externalities. Despite being resource rich, many countries face persistent fiscal deficits, often resorting to borrowing to cover higher expenditures. This borrowing affects revenue allocation, as funds that could enhance a country's productive capacity are instead diverted towards debt servicing. The resulting impact on economic growth thereafter depends significantly on the country's debt-to-GDP ratio. This study sought to examine the effect of taxation on economic growth amidst Zambia's debt crisis, using annual time series data from 1995 to 2023. The analysis employed the Autoregressive Distributed Lag (ARDL) model, which incorporates Cointegration and Error Correction techniques to assess the effect of public debt, direct taxes revenue, indirect taxes revenue, and trade taxes revenue on economic growth. The empirical findings indicate that, in the long run, public debt was significant with a negative coefficient, Direct taxes revenue was significant with a positive coefficient, Indirect taxes revenue was insignificant but had a positive coefficient while Trade taxes revenue was significant with a negative coefficient. In the short run, only trade taxes revenue exhibited a relationship with economic growth, showing a significant and positive coefficient. Based on these findings, the study recommends accelerating debt restructuring to free up resources for investment in productive sectors of the economy, promoting stable mining policies to create a conducive environment for investors and ensure consistent revenue from the sector, introducing a sales tax to eliminate VAT refund backlogs and enhance revenue efficiency, and lastly, the government should encourage regional trade by leveraging regional trade agreements to expand markets.

Keywords: Real Gross Domestic Product, Public Debt, Direct taxes revenue, Indirect taxes revenue, and Trade taxes revenue

1. Introduction

Globally, governments collect revenues mainly for two purposes: to finance the goods and services they provide to citizens and businesses, and to fulfil their redistributive role, (OECD, 2024). However, despite being endowed with resources, most developing countries still face the problem of fiscal deficit which can be attributed to the rapid expansion of government expenditure relative to revenue collection. In order to bridge this gap between their income and spending, they often borrow because tax rises are politically difficult (Read, 2022).

However, with increased debt, the government spends more of its budget on interest payments, thereby crowding out public capital investments such as public education, public hospitals, water systems, roads and so on (Petersen, 2024). Broadly, when government action reduces the amount of capital investment in the economy, the long-run growth of the economy declines. This effect can be partially mitigated if new deficit-financing spending takes the form of human capital investment, public capital, and public goods such as research (Penn, 2021).

The alternative, taxation, albeit being politically challenging, is the most reliable and sustainable source of finance to remedy fiscal deficits. To resume economic growth, reduce poverty, and support climate action, countries need to increase tax collection and make tax systems more equitable and efficient. More efficient tax systems can also enable the private sector to play the important role of creating jobs (WorldBank, 2024).

The rate of economic growth according to Myles (2009), can be influenced by policy choices, particularly through the impact of taxation on economic decisions. An increase in taxation reduces the returns on investment in both physical and human capital, as well as in Research and Development (R&D). Lower returns result in less accumulation and innovation, leading to a slower growth rate. This represents the negative side of taxation. However, taxation also has a positive aspect: it funds public expenditures that can boost productivity, such as investments in infrastructure, education, and healthcare. By financing these essential services, taxation can indirectly contribute to a higher growth rate.

In addition to the policy implications, tax policy is used for the social and economic purposes. These include but not limited to resource allocation through higher savings generated internally, stable prices, controlling the production and consumption level indirectly through sales taxes, and increasing growth of the economy. Over the decades, economists have been interested in investigating factors causing different countries to grow at different rates and

achieve different levels of wealth accumulation. To this effect, most economists agree that taxation is one of the significant factors that determines the productive capacity of the country (Maganya, 2020).

1.1 Background of the study

In 2011, Zambia transitioned from a low-income to a lower middle-income country. This reclassification significantly limited its access to concessional financing and enabled it to borrow commercially on the international market. Subsequently, Zambia issued three Eurobonds totalling US\$3 billion between 2012 and 2015. This borrowing surge was driven by an ambitious infrastructure-led development agenda outlined in both Zambia's 6NDP and its revised version after the Patriotic Front (PF) took over from the MMD following the 2011 elections. This change in government led to a shift from a conservative fiscal policy to an expansionary stance, resulting in excessive overspending and borrowing. Most infrastructure development projects in the last 10 years, including those in roads, energy, and agriculture, were financed through external and domestic borrowing (Actionaid, 2023).

While borrowing for infrastructure aimed to promote sustainable pro-poor development, it had at least two significant implications. Firstly, official government statistics show that borrowing as a percentage of Gross Domestic Product (GDP) rose from 5.6 percent in 2012 to 18.4 percent in 2013, before decreasing to 13 percent in 2014. Secondly, between 2012 and 2015, the Zambian government encountered persistent fiscal deficits, largely due to debt repayments stemming from increased borrowing for infrastructure projects and declining revenues linked to falling copper prices (Sichiwema, 2021).

Zambia's debt contraction has not increased growth and growing debt servicing costs have weakened the economy and in turn stifled tax revenue collection. This has left the country in a vicious cycle where it needs to borrow to finance economic development. Zambia became the first country to default on sovereign debt during the pandemic and is now a critical case study for managing developing country debt in a post-COVID-19 context. This situation unfolds against a backdrop of a changing landscape for low-income country (LIC) debt, which differs significantly from the debt crises experienced in the 1980s and early 2000s. Three key developments have emerged from this evolving scenario. Firstly, the international sovereign debt system for developing countries reveals significant flaws, lacking a clear framework for countries to follow. Secondly, the nature of debt held by LICs like Zambia has shifted from concessional bilateral loans to commercial debt instruments, such as Eurobonds. Finally, China's rise as a major player in the LIC debt

market represents perhaps the most significant change. As a result, Zambia's debt restructuring process is proving to be long, challenging, and complicated (Siwale & Gong, 2023).

In every modern society, including Zambia, the responsibility for generating resources for public service delivery and other expenditures falls on the government. These resources can be raised mainly through domestic revenue mobilization (DRM) via taxes, fees, and fines, as well as through concessional and commercial debt and grants from international partners. Due to current global economic conditions, domestic resources via taxation have become increasingly crucial for financing public services, as the role of grants is diminishing and developed countries, which are traditional benefactors of these grants, face tighter fiscal constraints (Actionaid, 2022).

The relationship between taxation and economic growth has garnered significant attention in recent years. Theoretically, endogenous growth models suggest that the accumulation of productive capital can promote long-term economic growth. Consequently, any tax policy that affects the accumulation of physical and/or human capital can influence long-term economic growth (Romer, 1986; Lucas Jr., 1988; Barro, 1990). This effect can be either positive or negative, as increased taxes can boost government spending while potentially crowding out private investments.

Increasing government revenues through taxation is essential to allow Zambia to own and flexibly chart policies that address its specific development challenges and bridge the gap that debt payments will leave, thereby enhancing economic growth. In light of this context, the study aims to investigate this relationship.

In general, a tax system should be responsive to the growth of the economy. As economic activity grows, tax revenues should also increase, as the country's tax base often closely follows GDP. The ratio of the tax revenue to Gross Domestic Product (GDP) is an indicator of a country's revenue performance and therefore a measure of the resources available

for expenditure. A high tax-to-GDP ratio indicates that the government is collecting more revenue and, theoretically, has more resources to spend on public service delivery (Muleya, et al., 2022). Figure 1 below depicts;

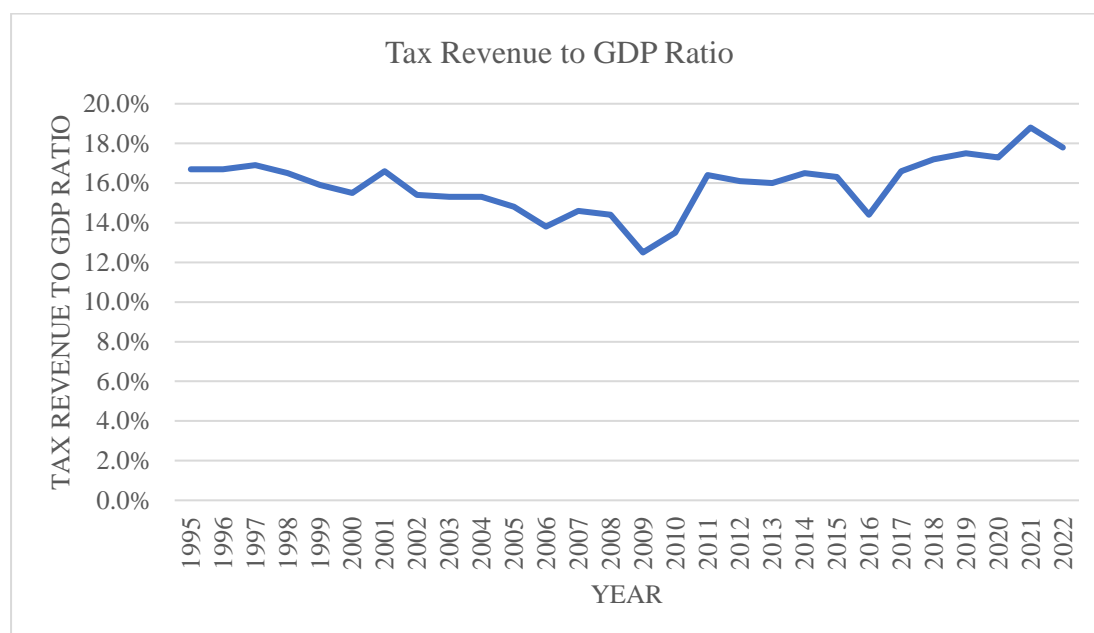


Figure 1 Tax revenue to GDP ratio

Source: Zambia Revenue Authority

From 1995 to 2022, Zambia averaged 17.8 percent of tax revenue to GDP. However, this was below the target set in the national development plan, which was 20 percent of GDP. It can further be observed that the ratio fell continuously from about 16 percent in 1997 to 11.7 percent in 2009 after which it rose gradually with a major dip in 2016 (USAID, 2024). In 2023, domestic revenue (both tax and non-tax) as a percentage of GDP met the 8NDP target of 21.8 percent, up from 19.6 percent of GDP in 2022. This indicated an increased capacity of government to generate revenue from domestic resources (National-Assembly, 2023). In the 2025 fiscal year, the government aims to increase the domestic revenue to atleast 21.3 percent of GDP according to the 2025 budget address.

1.2 Problem Statement

In the last ten years, Zambia has faced a significant number of fiscal challenges that have further accelerated the contraction of debt. In 2023, Zambia reached an agreement to restructure its \$6.3 billion debt owed to official creditors. The premise of this restructure was, if the agreed terms are promptly implemented, it would greatly improve the government's fiscal trajectory and credit standing, providing additional fiscal space to allocate more resources to critical public investments, particularly in healthcare, education, and infrastructure development, thereby enhancing economic growth (MOFNP, 2023).

However, following the debt restructuring, in 2024, the country faced its worst drought, leading to its classification as a natural disaster and emergency. As a result, the anticipated benefits of the debt restructuring have been overshadowed by this disaster. This shifted the country's attention because the country is highly reliant on a good rainfall pattern for food security through farming and electrical energy generation. In order to mitigate the effects of drought on the energy sector which hampered economic growth in 2024, the government has embarked on several measures such as the construction of an additional thermal power plant in Maamba. It is in the wake of these and other measures in the mining sector that, according to MoFNP (2024), the country is projected to achieve a real GDP growth rate of 6.6 percent in 2025, compared to 2.3 percent in 2024.

Domestic mobilization of resources is at the heart of this growth. Tax revenues are expected to cover 80.2 percent of the total expenditure according to the 2025 budget. Therefore, against this revelation(s) of the need for growth, that the study aims to investigate the effect of taxation on economic growth in the context of the ongoing debt crisis in Zambia.

1.3 Research Questions

Based on the aim of the study, the following are the research questions:

- 1) What effect does public debt have on economic growth?
- 2) What effect does direct taxes revenue have on economic growth?
- 3) What effect does indirect taxes revenue have on economic growth?
- 4) What effect does trade taxes revenue have on economic growth?

2. Literature Review

2.1 Overview of Taxation in Zambia

Tax is a fee that is charged to individuals and organizations. Taxation, therefore implies the means by which a government or the taxing authority imposes or levies a tax on its citizens and business entities (PMRC, 2020).

To promote economic growth and development, governments need sustainable funding sources for social programs and public investments. Programs that provide essential services such as health, education, and infrastructure are crucial for achieving the shared goal of a prosperous, functional, and orderly society. These programs require governments to raise revenue, and taxation plays a vital role not only in funding public goods and services

but also, in underpinning the social contract between citizens and the state. The way taxes are raised and spent can significantly impact a government's legitimacy. Holding

governments accountable fosters, the effective management of tax revenues and supports broader public financial management. All governments need revenue, but the challenge is to carefully choose not only the level of tax rates but also the tax base. Governments also need to design a tax compliance system that will not discourage taxpayers from participating (World-Bank, n.d).

2.2 Taxation in the Mining Sector

Geologically, Zambia is endowed with a wealth of mineral resources, including copper-cobalt ore, gold, uranium, nickel, lead-zinc, and iron, among others. Since the 1930s, when the first significant exploitation of the Copperbelt's copper - cobalt deposits began, the mining industry has served as Zambia's economic and social backbone (TaxRegime, n.d). The mining sector in Zambia can be divided into two main categories: the copper mining sector, which is primarily controlled by multinational corporations, and the non-copper mining sector, which includes a mix of large companies as well as artisanal and small-scale miners (Mbewe & Nsenduluka, 2023).

Mining taxation policy is a central issue in policy debates in Zambia. The core of the discussion is how the government can maximize revenues from the extractive sector while ensuring that mining firms can still generate profits. The mining policy has been characterised by frequent policy changes and reversals. By one estimate, Zambia on average has had one tax change every 18 months since 2001 (Zambia Chamber of Mines, 2018).

The instability in mining taxation policy in Zambia seems to signal constrained capacity in the revenue administration's ability to collect revenue from the sector. Arguably, problems of tax administration are sought to be addressed by changes in tax policy. Thus, the multiplicity of policy changes could potentially be a symptom of this. While policy limitations exist on the side of the state, it is equally important to look at the contribution of the mining sector to Zambia's development story (Siwale & Chibuye, 2019). According to diggers (2024), ZRA only has 6 mines out of over 6,000 entities with mining licences in the country that contributed to revenue collection in the first half of the 2024 fiscal year. Furthermore, the 6 mines contributed 80 percent of the gross revenue collected from the sector. This paints a picture of how much the mining sector contributes to the development story.

The establishment of the Specialised Taxpayer Office (STO) by ZRA is set out to address the revenue collection challenges in the mining sector. The department, which was born as a result a gap analysis in the New Operating Model (NOM) will house all the companies

involved in mining related activities. This includes artisanal and small-scale mining (ZRA, nd). The efforts of the authority are being complemented by the government as shown in the 2025 budget address. In an effort to unlock the industry, the government has revived Konkola Copper Mines and Mopani Copper Mines which were entangled in legal disputes. In addition, the government has also embarked on improving the mining investment in the country. Notably, Shaft 28, Lubambe mine, Kalengwa mine and the Mingomba mine project have received initial investments. These developments will lead to an increase in the production of copper among other minerals. The success of these projects will spiral economic activity and consequently lead to increased revenue collections.

2.3 Literature on public debt

Public debt comprises all outstanding loans and guarantees that a central government owes to its creditors. This debt may be internal, originating from the sale of bonds within the government's territory; or external, as received from foreign governments or international institutions such as the World Bank. The amount of public debt a government holds does not itself indicate that government's economic strength or weakness. Often, strong economies are quite active with international Trade and have large amounts of public debt. Instead, the ratio of that public debt to the government's Gross Domestic Product (GDP) is a more accurate, internationally accepted measure for assessing a nation's debt and potential credit risk (SADC, 2022).

Public debt plays a crucial role in development, enabling governments to finance expenditures, invest in their citizens, and build a foundation for a better future. However, excessive or rapidly growing public debt can become a significant burden, as is currently evident across the developing world. In 2023, global public debt reached a record high of US\$97 trillion. While public debt in developing countries accounted for less than one-third of this total, US\$29 trillion, it has grown at twice the rate of debt in developed economies since 2010 (UNCTAD, 2024).

Developing nations now face escalating and costly external debt burdens. Debt service on external public debt reached US\$365 billion in 2022, amounting to 6.3 percent of export revenues. This trend is primarily driven by high borrowing costs, which divert resources to creditors, making it challenging for these countries to fund critical investments. Moreover, interest payments in developing countries are not only increasing rapidly but are also surpassing growth in essential public expenditures such as health and education. As a result, interest payments are constraining fiscal space across developing nations. For instance, during the early years of the COVID-19 pandemic, countries in Africa and Asia (excluding China) allocated more resources to interest payments than to healthcare. This

imbalance underscores the growing pressure of debt on development priorities in these regions (UNCTAD, 2024).

2.4 Literature on economic growth

Economic growth specifically refers to the increase and enhancement of the goods and services produced by an entity, such as a country. Economic growth, which forms the foundation of increased prosperity, is achieved through the accumulation of both human and physical capital, as well as innovations that drive technical progress. These factors enhance the productivity of production inputs and expand the potential output level. Traditionally, GDP has been regarded as the most accurate measure of a country's economic growth, as it reflects the total economic output, including both domestically and internationally sold goods and services (IMF, n.d).

Energy sufficiency has had such a profound impact on economic output that the 4.8 percent growth target outlined in the 2024 budget is now projected to be only 2.3 percent, making a 52 percent reduction in anticipated economic growth. Unnervingly, agriculture is expected to decline by 19 percent, reflecting a general reduction in productivity across all major sectors. Although specific figures are unavailable, this situation is far from ideal given Zambia's previous performance and future goals. The anticipated benefits from achievements in debt restructuring and positive developments in the mining sector such as new investments and issue resolutions have been overshadowed by the adverse effects of drought (PWC, 2024).

The government aims to achieve a real GDP growth rate of 6.6 percent in the 2025 fiscal year, building on recent advancements in the fiscal landscape. These include enhanced domestic resource mobilization through taxation and improvements in various sectors, particularly energy. Key initiatives in the energy sector involve promoting off-grid solutions like industrial generators and solar systems, constructing an additional thermal power plant in Maamba, and attracting investments from Zesco and private investors for several solar power stations at strategic locations (MoFNP, 2024). In addition, Foreign Direct Investment (FDI) has been noted as one of the indicators of economic growth. Despite the decreasing rate of FDI inflows in the recent years due to the global pandemic and a reduction in mining activities, overall, FDI leads to economic growth (Ndlovu & Haabazoka, 2024).

According to (efremenko et. al, 2017), experts from the International Monetary Fund (IMF) predicted that the potential growth of national economies in emerging markets would gradually decline from 6.5% between 2008 and 2014 to 5.2% between 2015 and 2020. This slowdown was primarily attributed to structural constraints limiting investment

growth, a decline in productivity gains due to the diminishing impact of innovative technologies, and an aging population.

2.5 Literature on Taxation and Economic Growth: Review of Similar Studies

There exist a large number of empirical studies on the impact of taxation on economic growth with many variables being considered. However, their empirical findings have been mixed because of their sensitivity to the set of countries and the research questions being asked.

Locally, Mubanga (2022), conducted a study seeking to evaluate the relationship between taxation and economic growth in Zambia using multiple regression analysis to analyze time series data. The Augmented Dicker Fuller (ADF), Auto Regressive Distributed Lag (ARDL) and Error Correction Models (ECM) were employed to test the stationarity of data in order to establish both the short-run and the long-run relationship between taxation and economic growth. The study revealed that direct taxes and extraction royalty had a negative impact on economic growth while indirect taxes and trade taxes were insignificant in the short run. In the long run, the study revealed that direct taxes, extraction royalty and indirect taxes had a positive effect on economic growth while trade taxes were significant but negatively affecting economic growth.

Osaretin et al., (2022), examined the effects of taxation on the growth of the Nigerian economy over a period of 30 years ranging from 1990 – 2019. Diagnostic tests that were carried out include: descriptive statistics used to test for the normality of the data; the Augmented Dickey Fuller unit root test to test for the stationarity of the data; and the Johansen Co-integration test to test for long-run equilibrium relationships that exist among the variables. For data analysis, Auto Regressive Distributive Lag (ARDL) techniques were used as a statistical tool. Based on the results obtained from ARDL, it was found that Petroleum Profit Tax (PPT), Custom & Excise Duties (CED) and Value Added Tax (VAT) have positive effects on the growth of mining and quarrying, with Company Income Tax (CIT) exerting a negative effect on them. The findings also revealed that Petroleum Profit Tax (PPT) and Customs & Excise Duties (CED) have a positive impact on growth of the manufacturing and processing sector, while Company Income Tax (CIT) and Value Added Tax have a negative impact.

Mohammed, et al., (2018), conducted a study to investigate the effect of taxes and government expenditures on economic growth in Jordan using a time series data for the period 1970-2017. Gross Domestic Product (GDP) was adopted as the dependent variable while Taxes (T) and government expenditure (GE) represents the independent variables. In addition, this study used Autoregressive Distributive Lag (ARDL), the unit root tests

Augmented Dickey-xFuller (ADF), Phillip-Perron (PP) for the analysis. The study found that the taxes and government expenditure at the aggregate level have a significant positive impact on economic growth.

2.6 Literature on Public Debt and Economic Growth: Review of Similar Studies

Caner, Grennes, and Koehler-Geib (2010) analyzed data from 99 countries between 1980 and 2008 and determined that the threshold level of the average debt-to-GDP ratio for GDP growth is 77 percent across the sample. They further concluded that when debt exceeds this threshold, each additional percentage point of debt reduces annual real GDP growth by 0.017 percentage points. The study employed a least squares regression model, incorporating controls for trade openness, inflation, and other variables.

Reinhart and Rogoff (2010) is arguably the cornerstone study on the subject of debt and growth post-Global Financial Crisis. In order to determine the effects of government debt on growth, the authors compiled data covering 1946 to 2009 from the IMF, World Bank, and OECD for 44 countries. The study found that, across both advanced and emerging economies, high debt-to-GDP levels (90 percent and greater) are associated with notably less growth. Countries with debt-to-GDP ratios greater than 90 percent have median growth roughly 1.5 percent lower than that of the less-debt-burdened groups and mean growth almost 3 percent lower.

2.7 Variables

This study employed a conceptual framework based on the neoclassical and endogenous growth models with the primary goal of demonstrating whether taxation has an effect on economic growth amidst the debt crisis using time series data from 1995 to 2023. The neoclassical models argue that taxes do not affect long-term economic growth because the factors including savings and investments will only lead to growth in the short run while endogenous growth models such as the AK model, the R&D model and the human capital model argue that taxes can have an impact on growth in the long run. Thus, the dependent variable is Economic growth using the proxy real GDP growth and the three independent variables are: direct taxes revenue, indirect taxes revenue and trade taxes revenue with public debt being a moderating variable. Here is how the conceptual framework is presented

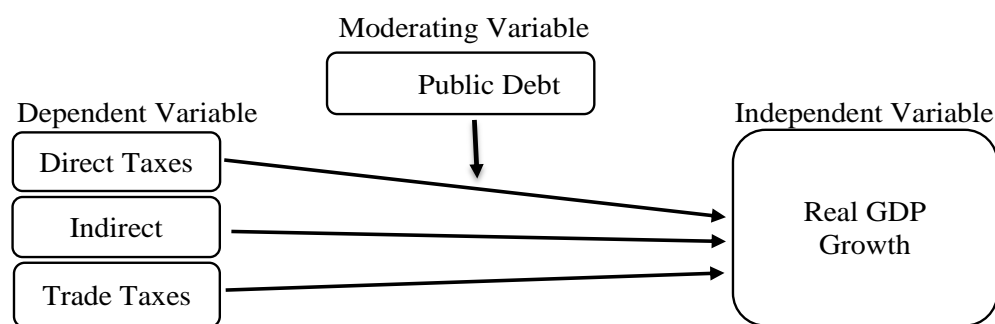


Figure 2: Conceptual Framework

Source: Authors Compilation

3. Research Methodology

3.1 Philosophy, approach, design, sample size and data sources

The approach the study undertook was chosen based on the purpose and research questions set out to be addressed. The paper was interested in examining the associations between the dependent variable, economic growth, and independent variables; direct taxes revenue, public debt, indirect taxes revenue and trade taxes revenue using time series data from 1995 to 2023 using the autoregressive distribution lag (ARDL) model. The quantitative approach provides an excellent way of finalizing results and proving or disapproving the hypothesis. Secondary data was used from sources such as ZRA and World banks world development indicators.

3.2 Data Analysis

The study employed the Autoregressive Distributed Lag (ARDL) method to estimate the parameters because it is preferable when dealing with variables that are integrated of different order $I(0)$ and $I(1)$ or a combination of both which gives realistic and efficient estimates. For this analysis, the study used Microsoft excel, Microsoft word and Stata 14.2 to carry out different tests.

4. Results and Discussion

4.1 Unit root tests for stationarity

A unit root is a unit of measurement used to determine how much stationarity a time series model has (Ozbun, 2021). The importance of performing this test is to verify that the variables are not integrated of order higher than one which might lead to spurious regression. For this study, the Augmented Dickey – Fuller (ADF) test was used to determine whether the variables are stationary using Stata. Table 1 shows the results of the ADF test.

Table 1. Augmented Dickey-Fuller (ADF) test results

Variable	Test Statistic	Level	Test Statistic	1st Difference	Decision
lnrgdp	-0.449	-1.950*	-5.770	-1.950*	I(1)
lnpd	-0.801	-1.950*	-3.913	-1.950*	I(1)
dtr	0.736	-1.950*	-2.948	-1.950*	I(1)
idtr	1.593	-1.950*	-3.837	-1.950*	I(1)
ttr	2.035	-1.950*	2.087	-1.950*	I(0)

Note: * Indicates 5% level of significance

Source: Author's compilation

Decision Criteria for Unit Root Tests

Reject the null-hypothesis if the t-statistic is greater than the 5% critical value. That implies, the data is stationary. The findings of the Augmented Dickey Fuller (ADF) test presented in table 5.2 indicates that real Growth Domestic Product (rGDP), Public Debt (PD), Direct Taxes Revenue (DTR) and Indirect Taxes (IDTR) are integrated at first difference I(1) while Trade Taxes Revenue (TTR) is integrated at level I(0). Therefore, whenever the variables are a mixture of I(0) and I(1), then the ARDL method is preferred.

4.2 Bounds test: Co-integration Test

Developed by Pesaran et al. (2001), is a statistical method used to determine the existence of a long run equilibrium relationship among variables in time series data within an Autoregressive Distributed Lag (ARDL) framework. It is particularly useful for examining the cointegration of variables regardless of whether they are stationary at level I(0) or at first difference I(1) making it flexible for mixed orders of integration.

Hypothesis Test

Null Hypothesis (H₀): No Cointegration exists among variables

Alternative Hypothesis (H₁): Cointegration exists among the variables

weak. The findings of the study are consistent with those of Mubanga (2022), whose study revealed that direct taxes have a positive impact on economic growth. The results, however, argue with those of Maganya (2020) and Nkole (2019), whose results showed income taxes and PAYE, respectively, had a significant negative impact on economic growth in the long run.

Thirdly, the study found that indirect taxes revenue was insignificant with a positive effect on economic growth. These results, however, argue with Mubanga (2022), whose study revealed that indirect taxes are significant and that they have a positive effect on economic growth. Similarly, the study argues with the findings of Ferede and Dahlby (2012), whose study revealed that switching from sales tax to value added tax (VAT) led to a positive effect on investment and growth.

Lastly, the study found that trade taxes revenue was significant with a negative effect on economic growth. These results are synonymous with Mubanga (2022), whose study revealed that trade taxes are significant and negatively affect economic growth.

4.4.2 Short run

The study sought to establish the impact of taxation on economic growth in the short-run. The study revealed that trade taxes revenue was significant and had a positive effect on economic growth. This therefore, implies that a 1 percentage increase in trade taxes in the leads to a 0.0015 percentage increase in economic growth. These results are inconsistent with those of Mubanga (2022) whose study revealed that trade taxes are insignificant.

Secondly, the study revealed that public debt, direct taxes and indirect taxes had no effect on economic growth in the short run.

4.5 Diagnostic tests

4.5.1 Heteroscedasticity

To test heteroscedasticity, the study adopted the Whites test. The null-hypothesis of the test is that the variance of the error term is homoscedastic while the alternative hypothesis states that the variance of the error term is not homoscedastic. If the P-value of the corresponding observed R-squared is not significant at 5 percent, we reject the null-hypothesis. Below are the results of the Whites test for heteroscedasticity.

Table 4: Heteroscedasticity

```
. estat imtest, white

White's test for Ho: homoskedasticity
  against Ha: unrestricted heteroskedasticity

      chi2(27)    =    28.00
      Prob > chi2 =    0.4110

Cameron & Trivedi's decomposition of IM-test
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Source	chi2	df	p
Heteroskedasticity	28.00	27	0.4110
Skewness	20.33	6	0.0024
Kurtosis	2.35	1	0.1256
Total	50.68	34	0.0328

From the test results in table 4 above, it can be noted that the P-value is 0.4110 which is greater than 0.05. Therefore, we fail to reject the null hypothesis and conclude that the error term exhibits constant variance for each observation.

4.5.2 Autocorrelation

In this study, the Durbin-Watson test was used to detect autocorrelation, and the Breusch-Godfrey test was performed to validate the results of the Durbin-Watson test.

Table 5: Autocorrelation

```
. estat dwatson

Durbin-Watson d-statistic( 7, 28) = 2.09732

. estat bgodfrey, lags(4)

Breusch-Godfrey LM test for autocorrelation
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lags (p)	chi2	df	Prob > chi2
4	4.992	4	0.2881

H0: no serial correlation

The value of the Durbin Watson test ranges from 0 to 4. The table below shows:

Table 6: Durbin-Watson test range

d = 2	d < 2	d > 2
No autocorrelation	Positive correlation	Negative correlation

From the test results above, it can be noted that the d-statistic is 2.09732 which is equal to 2. Therefore, we fail to reject the null hypothesis and conclude that there's no autocorrelation.

4.5.3 Normality test

Normality is a necessary condition for all data sets in time series, thus a test needs to be conducted before it can be used for interference. Non-Normally distributed data sets can lead to spurious results. There are many methods used to test for overall normality of the data. This study employs the Shapiro Wilk test for normality for normality.

H₀: there is normal distribution

H₁: there is no normal distribution

Table 7: Normality test

. swilk lnrgdp lnpd dtr idtr ttr

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
lnrgdp	29	0.70028	9.289	4.599	0.00000
lnpd	29	0.87228	3.958	2.839	0.00226
dtr	29	0.75274	7.663	4.202	0.00001
idtr	29	0.79594	6.324	3.806	0.00007
ttr	29	0.81040	5.876	3.654	0.00013

Table 7 shows the results obtained using the Shapiro Wilk test for normality at 5 percent level of significance. The test does not reject the null hypothesis for all the variables because they are insignificant. Therefore, we can conclude that the data is normally distributed.

5. Conclusions and Recommendations

The following were the conclusions made from the research findings;

- For the period 1995 to 2023, public debt had a significant and long-term relationship with economic growth, while no relationship was observed in the short run.
- For the period 1995 to 2023, direct taxes revenue had a significant and positive long-term relationship with economic growth, while no relationship was observed in the short run.
- For the period 1995 to 2023, indirect taxes revenue had an insignificant in the long run with a positive relationship to economic growth while in the short run, the relationship was non-existent.
- For the period 1995 to 2023, trade taxes revenue had a significant and negative relationship to economic growth in the long run while in the short run, it had a significant and positive relationship to economic growth

Policy implication and recommendations

In investigating the effect of taxation on economic growth amidst Zambia's debt crisis, the study found that public debt, direct tax revenue, indirect tax revenue, and trade tax revenue all influenced economic growth in the long run. However, in the short run, only trade tax revenue had an impact on economic growth. Based on these findings, the study makes the following recommendations:

Firstly, regarding public debt, the study recommends productive borrowing. The government should ensure that debt is directed towards high-return projects in sectors such as mining and energy to stimulate growth and generate revenue for repayment. Furthermore, the government should strengthen its debt management strategy by implementing a robust framework to monitor and control borrowing levels, ensuring sustainability. Lastly, enhancing domestic revenue mobilization is crucial. This involves expanding the tax base and improving collection efficiency to reduce reliance on external borrowing. By focusing on sustainable borrowing practices and leveraging debt for growth-oriented investments, the negative long-term effects of public debt on economic growth can be minimized.

Secondly, regarding direct tax revenue, the study recommends maintaining stability in the mining policy. Since the mining sector contributes 80 percent of total revenue (from PAYE, CIT, and Mineral Royalty), stability would ensure consistent and predictable revenue from this sector. Additionally, the Zambia Revenue Authority (ZRA) should

strengthen its enforcement activities to boost rental income collections, as insufficient enforcement has resulted in revenue leakages.

Thirdly, regarding indirect taxes, the study recommends introducing a sales tax to eliminate the need for VAT refunds. The additional resources generated could then be redirected towards productive sectors of the economy.

Lastly, regarding trade tax revenue, the study recommends promoting trade facilitation by lowering trade barriers and investing in trade-enhancing measures, such as improving customs efficiency and infrastructure, to stimulate both exports and imports. Additionally, the government should implement targeted tax policies, adjusting trade taxes to support sectors with high growth potential, such as manufacturing and exports, while avoiding excessive taxation that could stifle trade. Furthermore, the government should encourage regional trade by leveraging regional trade agreements to expand markets and boost economic activity.

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