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Impact of Corporate Income Tax on Economic Growth in Zambia: An Instrumental Variable Approach

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Abstract

Purpose: The study examined the impact of corporate income tax on economic growth in Zambia using the Instrumental Variable (IV) approach.

Materials and Methods: The study utilized a quantitative research approach, employing time series data for the period 1994-2023. The data was compiled from various sources. The top statutory corporate and personal income tax rates were obtained from the World Tax Database while the other variables namely, FDI, population growth, education and trade were obtained from the World Development Indicators, compiled by the World Bank. The study employed both OLS and 2SLS using IV Methods to address endogeneity concerns.

Findings: The empirical findings show a statistically significant negative impact of CIT on economic growth in Zambia. OLS estimates suggest that higher CIT rates are associated with slower GDP per capita growth, though the magnitude of this effect is relatively small. However, the IV approach yields larger negative coefficients, reinforcing the argument that CIT exerts a substantial adverse effect on economic growth when endogeneity is accounted for. Specifically, the IV results indicate that a 10 percent reduction in the corporate tax rate causes an increase in GDP per capita growth by approximately 1.19 to 1.34 percent.

Unique Contribution to Theory, Practice and Policy: The negative impact of CIT on economic growth calls for policymakers to come up with an optimal taxation structure in which taxation of income is not excessive. This is attributed to the effects of a high CIT rate which discourages reinvestment by reducing after-tax profits, limiting the capacity of firms to expand, innovate and/or create jobs. In turn, this dampens productivity and slows overall economic growth. The study recommends that policymakers should consider lowering the CIT rate to encourage business expansion, attract investment and boost job creation.

Keywords: *Corporate Income Tax, Economic Growth, Two Stage Least Squares, Instrumental Variable, Zambia.*

JEL Classification: *H21, H25, O40*

INTRODUCTION

Globally, corporate tax rates have declined markedly from an average of 40.18% in 1980 to about 23.45% in 2023 (Tax Foundation, 2023). Today, most countries maintain corporate tax rates below 30%, with developing countries generally exceeding the global average. Taxes serve as a fundamental tool for governments not only to attract investment, but also to mobilize revenue for public services, infrastructural development and social welfare programs aimed at improving livelihoods in a country.

In developing countries such as Zambia, corporate taxation plays a dual role: it is both a key source of revenue and a policy instrument for influencing private sector activity. While an efficient corporate tax system supports fiscal sustainability, an overly burdensome one can discourage investment, reduce competitiveness and limit economic expansion (Siwale & Chibuye, 2019). The challenge for policymakers lies in striking a balance between mobilizing adequate resources and fostering a business environment conducive to growth.

However, there is an ongoing debate on the impact of corporate taxes on economic growth, particularly regarding their effects on firm expansion, employment generation and capital accumulation (Lee & Gordon, 2005; Djankov et al., 2010). Critics argue that high corporate tax rates discourage business growth and investment by reducing after-tax profits and firms' ability to reinvest (Huang & Frentz, 2014). Such concerns have prompted many governments to introduce tax concessions or preferential regimes to support investment (Pycroft, 2004). Conversely, proponents maintain that a well-structured corporate tax system promotes economic equity by ensuring that businesses contribute their fair share, reducing inequality and discouraging excessive profit-hoarding (Piketty & Saez, 2007; IMF, 2014). For instance, Pycroft (2004) argues that preferential mining tax treatment is irrelevant because mining companies do not declare profits, particularly in developing countries.

Other studies from developed economies indicate that reductions in CIT rates can spur business investment, increase employment and enhance economic output (Arnold et al., 2011). For instance, empirical evidence from the United States shows that CIT cuts tend to attract firms to lower-tax jurisdictions, leading to regional economic growth (Suárez et al, 2023). However, the benefits of tax cuts are not always evenly distributed, as firm owners and high-income earners often capture a disproportionate share of the gains, while workers bear the burden of revenue shortfalls through indirect taxes (Gale & Thorpe, 2024).

In the context of Sub-Saharan Africa, taxation plays a crucial role in determining both government revenue and its elasticity relative to GDP growth. Brückner (2012) found that tax revenues in African countries are highly responsive to GDP fluctuations, with corporate taxes exhibiting strong revenue elasticity. This suggests that tax policies must be carefully designed to ensure stability during economic downturns. In Zambia, fluctuations in commodity prices, particularly copper, significantly affect tax revenues, making corporate taxation an even more critical component of fiscal planning (ZIPAR, 2025).

Tax Policy Challenges and Economic Implications in Zambia

Zambia's tax policy has undergone multiple reforms aimed at improving compliance and revenue generation. Zambia's mining taxation framework is often subject to frequent adjustments, creating uncertainty for investors, thus, affecting investments for business expansion (Manley, 2013; Siwale & Chibuye, 2019). When it comes to corporate taxation in Zambia, there has been different rates across different sectors ranging from 10% in agriculture to 45% in banking sectors. Whereas other sectors such as manufacturing and mining sectors have been taxed between 30% and 35% (Langmead & Baker, 2006). These policy decisions to

differentiate the rates arise from Governments need to balance revenue mobilization and also to incentives some sectors identified as priority sectors for national development.

However, these reforms have not always translated into sustained economic growth. The country's reliance on extractive industries, particularly mining, has led to concerns over the volatility of corporate tax revenues. For instance, Manley (2013) highlights that the unpredictability of tax policies, coupled with administrative inefficiencies, raises concerns about the long-term impact of corporate taxation on economic growth. Direct taxes consistently remained significant contributors, averaging around 48.5% of total tax revenue between 2018 and 2022. Specifically, Personal Income Tax (PIT) and CIT were notable, accounting for substantial proportions of total revenues. For instance, CIT revenue increased significantly from 2.1% to 4.2% of GDP, peaking at 4.6% in 2021 (ZRA, 2022). Non-mining CIT showed better resilience, reflecting improved compliance and enforcement measures by the tax authority. The revenue from non-mining sectors exceeded targets by approximately 13.9% in 2022 (ZRA, 2022).

The effectiveness of Zambia's corporate tax system is complicated by structural challenges such as limited tax compliance and high levels of informality in the economy, thus, narrow tax bases. JCTR (2014) reports that CIT contributes significantly to Zambia's tax revenue (highest contributor to mining taxes for the period 2008 to 2013) but is undermined by tax avoidance strategies, particularly in the mining sector. Their study emphasizes the need for enhanced tax administration and policy consistency to improve revenue collection while ensuring that tax policies do not deter investment.

Given the ongoing debate surrounding CIT and its impact on economic growth, it is crucial to empirically assess the impact of CIT on economic growth in Zambia. Zambia maintained a relatively high corporate tax rate of 35% for several years (reduced to 30% in 2022). When compared to similar economies in the region, Zambia's historical CIT rates have been on the higher end. For instance, Botswana has maintained a lower and more stable CIT rate at 22%, Tanzania typically applies a standard 30% rate and Zimbabwe has fluctuated between 25% and 30%. These comparatively lower rates may offer a more attractive investment climate, potentially boosting business activity and job creation.

This study is anchored in neoclassical investment theory and endogenous growth theory. The neoclassical view hypothesizes that Company Income Tax (CIT) affects firm's marginal cost of capital and hence their investment decisions and output (Jorgenson, 1963). Lower effective tax rates tend to encourage firms to expand production and reinvest profits. In contrast, the endogenous growth framework highlights how taxation affects innovation, productivity and long-run growth through its impact on savings, human capital and technological progress (Romer, 1990). Together, these theories provide a foundation for understanding how corporate tax policy shapes both short-term investment dynamics and long-run economic growth.

This study aims to investigate the extent to which corporate taxes impact economic growth in Zambia using the Instrument Variable (IV) approach. By analyzing the impact of CIT on economic growth, the study seeks to provide evidence-based policy recommendations that promote optimal taxation and sustainable growth. This article is structured as follows: The first section provides an introduction. The second section presents a review of relevant literature and theories, offering insights into existing research and theoretical perspectives. Next, the methodology section outlines the approach used to analyze the data. Finally, the article concludes with a discussion of the findings and their implications together with recommendations.

Research Problem

CIT is one of the major components of Zambia's fiscal framework, consistently accounting for a substantial share of government revenue. Despite maintaining a relatively high statutory CIT rate for the period 1994-2022, Zambia's economic growth has remained volatile and relatively sluggish, fluctuating year-on-year with notable external and internal shocks (MOFNP, 2024).

While CIT collections have strengthened the government's revenue base, questions arise as to whether Zambia's relatively high CIT burden could be constraining private sector investment, productivity and ultimately, sustained economic growth. Evidence suggests that a heavy reliance on CIT, particularly amidst a narrowing tax base and an increasingly competitive global investment environment, might dampen incentives for business expansion and innovation (Desai, Foley & Hines, 2004; Hanappi, Millot & Turban, 2023). In 2023, for instance, even with a relatively higher rate in GDP growth of 5.4%, sectoral performances remained uneven and growth was driven more by ICT, education and financial services rather than broad-based industrial expansion (MOFNP, 2024).

Given the foregoing, it becomes critical to empirically examine the causal relationship between CIT and economic growth dynamics in Zambia. This study seeks to assess whether the current CIT structure is designed to support economic growth, or whether it inadvertently imposes constraints on private sector development and investment-led expansion using the IV approach.

Contribution of the Study

This study makes several important contributions to the existing literature on corporate taxation and economic growth, particularly in the context of developing economies like Zambia. Firstly, the study addresses endogeneity in CIT and Growth Studies. Many prior studies examining the relationship between corporate taxation and economic growth face the challenge of endogeneity, where economic conditions influence tax policy decisions. This study employs an IV approach. By addressing this endogeneity problem, the study provides more robust and reliable estimates compared to conventional Ordinary Least Squares (OLS) regressions, which may suffer from omitted variable bias and reverse causality.

Secondly, the study provides empirical evidence on corporate taxation in Zambia. While extensive research has been conducted on corporate taxation in developed economies, relatively few studies provide empirical evidence specific to Zambia and Sub-Saharan Africa. This study fills this gap by analyzing time-series data (1994–2023) on Zambia's corporate tax policies and their impact on GDP growth.

Lastly, the study makes contributions on policy implications for developing economies. By demonstrating the adverse effects of high corporate tax rates on investment and firm expansion, this study contributes to the literature on tax policy and economic development in resource-dependent economies. The findings suggest that reducing corporate tax burdens while broadening the tax base could enhance economic growth without compromising revenue generation. This is particularly relevant for economies similar to Zambia, where economic volatility and reliance on extractive industries necessitate a carefully balanced tax policy.

LITERATURE REVIEW

Theoretical Review

The link between taxation and economic growth has been extensively studied within economic theory, yielding varying perspectives on the optimal design of tax systems. The Classical economic thought emphasizes that CIT imposes a direct cost on businesses by reducing after-tax profitability. This diminished profitability, in turn, discourages private investment, slows

capital accumulation and slows down overall economic expansion. According to this school of thought, corporate taxes create distortions in firms' investment decisions, leading to a misallocation of resources away from productive activities (Harberger, 1962).

The neoclassical economic thought demonstrates that taxation of capital significantly hampers capital accumulation, which in turn reduces output. A key theoretical concern that guides empirical testing is that corporate taxes distort factor prices, raising the cost of capital and reducing after-tax returns (Judd, 1985). This results in efficiency losses in resource allocation and may constrain capital accumulation. McBride (2012) adds that higher corporate tax rates increase the cost of capital, which may lead to lower levels of investment and slower firm and economic expansion. In the Zambian context, this theory is particularly relevant to the mining sector, which accounts for a large share of corporate tax revenues and foreign investment. High effective tax rates in mining may discourage reinvestment and expansion, whereas a more predictable and competitive tax regime could attract additional capital inflows and enhance production. Empirically, this theory guides the study to examine how variations in corporate tax rates impact on economic growth.

In the endogenous growth model, emphasis is on the role of knowledge and ideas in driving long-term economic growth. Further, technological progress, in this model, results from deliberate investment in R&D by firms, leading to new ideas and innovations (Gechert & Heimberger, 2022). In this school of thought, corporate taxes impact investment, innovation and human capital accumulation by reducing after-tax returns on capital (Ohrn, 2018). Higher taxes can discourage private investment and R&D, slowing technological progress and growth. However, if tax revenues are allocated towards productive public investments like infrastructure or education, they can counteract these negative effects. The long-term growth impact depends on the efficiency with which government spending supports growth-enhancing activities. For Zambia, this framework is important because corporate tax policy not only affects short-term profitability but also determines firms' incentives to invest in research, skills development and local value addition which are critical drivers for sustainable growth beyond mineral extraction. Empirically, the theory informs the inclusion of variables that capture the indirect effects of corporate taxation on economic growth.

Empirical Review

Empirical studies have yielded mixed results regarding the impact of corporate taxes on economic growth. The variations in findings often arise from differences in methodology, data sets and the level of development.

Alm & Rogers (2011) analyzed data from 48 U.S. states over the period 1959–1997 to investigate the relationship between corporate taxation and economic growth. Using panel data econometric techniques, including fixed effects and random effects models, they controlled for a range of state-specific characteristics such as education levels, infrastructure spending and demographic factors. Their findings revealed a positive relationship between corporate taxation and state economic growth, although they noted that the results were sensitive to the selection of control variables and the specific time periods considered. This sensitivity underscores the complexity of isolating the true causal effects of corporate taxes on growth outcomes.

TenKate & Milionis (2019) investigated the link between corporate taxation and economic growth. Using Generalized Method of Moments (GMM) estimators, they analyzed data from 77 developing and developed countries spanning 1965 to 2014. The study addressed potential endogeneity between tax rates and growth outcomes by using appropriate instrumental variables. The results suggested that higher corporate taxes may, under certain conditions, foster growth by incentivizing private innovation and providing governments with additional

revenue for productive public investment. However, it was emphasized that this positive effect was more likely to materialize in economies already positioned at the frontier of technological development, but for developing countries the relationship is in most cases statistically insignificant.

Kalaš et al. (2018) investigated the impact of CIT, VAT, and social security contributions on GDP growth in Serbia and Croatia. Employing multiple regression analysis on time series data for both countries, the study assessed how different tax components influenced economic growth when revenues were allocated toward productive government expenditures. Their findings revealed that CIT, VAT, and social security contributions exert a positive effect on GDP growth, provided that the revenue generated is efficiently directed toward investments in infrastructure, education and other growth-enhancing sectors. The study emphasized the importance of maintaining a balanced corporate tax policy, one that raises adequate government revenue while minimizing disincentives for private sector expansion and investment.

Other studies found a negative relationship between CIT and growth. Lee & Gordon (2005) used multiple estimation strategies, including fixed effects panel regression and instrumental variables based on neighboring countries' tax rates, to analyze a panel of 70 countries from 1970 to 1997. With several multiple control variables, their findings show a negative relationship between statutory corporate tax rates and economic growth, with their baseline estimates suggesting that a 10-percentage point reduction in corporate tax rates could boost annual growth rates by 1-2 percentage points.

Djankov et al. (2010), in a study of 85 countries, found that higher effective corporate tax rates were associated with lower investment, foreign direct investment (FDI), and entrepreneurial activity. A 10 percentage point increase in effective corporate tax rates led to a 2 percentage point reduction in aggregate investment. Romer & Romer (2010), using narrative analysis of U.S. tax changes between 1947 - 2007, found that a 1 percent increase in GDP through tax hikes reduced output by 3 percent over the next three years.

Arnold (2008) analyzed panel data from 21 OECD countries covering the period 1971 to 2004 to explore the effects of different tax types on economic growth. Utilizing fixed effects regression models, they examined the growth impact of corporate income taxes relative to personal income taxes while controlling for other macroeconomic and policy variables. Their results indicated that increases in corporate income taxes have a significantly stronger negative effect on economic growth compared to equivalent increases in personal income taxes. The study emphasized the growth-dampening potential of corporate taxation, highlighting the need for tax structures that are less reliant on taxing corporate profits in order to foster higher long-term economic growth.

Abbas & Klemm (2013) examined the impact of corporate taxation on investment and entrepreneurship across 50 developing countries over the period 1996 to 2007. Utilizing panel data econometric techniques, particularly fixed effects and instrumental variable (IV) regressions, they addressed potential endogeneity concerns between tax rates and investment behavior. Their results indicated that higher corporate tax rates exert significant negative effects on both investment and entrepreneurship, although the magnitude of these effects varied depending on institutional quality and the broader economic structure of the countries studied. The findings underscore the importance of considering country-specific factors when evaluating the growth implications of corporate tax policy.

On the other hand, some studies found a mixture of results concerning the relationship between corporate taxation and economic growth. Gechert & Heimberger (2022) using meta-regression

methods to a novel data set with 441 estimates from 42 primary studies, they conclude that literature is biased towards over-reporting positive effects of corporate tax cuts, with such results being about 2.7 to 3 times more likely to publish a result showing a statistically significant positive impact of corporate tax cuts on growth compared to a significant negative result. After adjusting for this bias, they are unable to reject the hypothesis that corporate taxes have no effect on economic growth. The reported estimates are influenced by several factors, including researchers' decisions on how to measure growth and corporate taxes, as well as the control of other budgetary components. Prillaman & Meier (2014), using data from 50 states in the United States from 1977-2005, found that corporate tax cuts had little to no positive effect on economic growth. Mertens & Ravn (2013), building on Romer & Romer's work, found that cuts in corporate tax rates led to significant increases in real GDP and productivity. A 1 percentage point cut in the corporate tax rate raised real GDP per capita by 0.3-0.4 percent initially, and 0.6-0.7 percent after three years.

From the above empirical analysis, several research gaps emerge that justify future studies. While extensive empirical work has been done on the causal relationship between corporate taxation and economic growth, most studies such as Alm & Rogers (2011), Lee & Gordon (2005), and Arnold (2008) focus on developed economies and cross-country settings. There is still limited empirical evidence on causality studies from resource-dependent developing economies like Zambia.

Furthermore, although studies such as TenKate & Milionis (2019) and Abbas & Klemm (2013) attempt to address endogeneity and institutional factors, few have examined how sector-specific tax regimes influence investment, reinvestment and long-term growth in African contexts. Existing research also tends to use aggregate data, overlooking firm-level dynamics and the differential impact of corporate taxation on industries with varying capital intensity, such as mining versus manufacturing.

Therefore, future studies should explore micro-level and sectoral analyses of corporate taxation in developing economies to understand its effect on investment behavior, productivity, diversification and growth. Additionally, there is scope to examine how corporate tax incentives and fiscal reforms interact with institutional quality and resource governance to influence sustainable growth outcomes.

MATRIALS AND METHODS

Data and Sample

The study utilized a quantitative research approach, employing time series data for the period 1994-2023. The data was compiled from various sources due to data incompleteness. The top statutory corporate and personal income tax rates were obtained from the World Tax Database while the other variables namely, FDI, population growth, education and trade were obtained from the World Development Indicators, compiled by the World Bank. Some missing data points were collected from Government reports such as annual economic reports and national budgets. Based on the literature, the following variables were used to assess the impact of CIT on economic growth.

Table I: Description of Variables

Variable	Description	Expected Relationship
LGDPPC	Natural log of GDP per Capita	
CIT	Top Statutory Corporate Income Tax Rate	Negative
PIT	Top Statutory Personal Income Tax Rate	Negative
FDI	Net Inflow Foreign Direct Investment	Positive
POPG	Population growth rate	Ambiguous
EDUC	Primary education enrollment[1]	Positive
TRADE	Trade, a sum of exports and imports of goods and services measured as a share of gross domestic product.	Positive

Source: Author's own illustration

Descriptive Statistics

Table II below shows the descriptive statistics on the variables employed in the study. Over the period under review (1994-2023), the top statutory corporate income tax rate in Zambia has been adjusted between 35 percent and 30 percent.

Table 2: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
LGDPPC	30	6.9583	0.2129	6.6514	7.2058
CIT	30	34.667	1.2685	30	35
PIT	30	34.167	3.2386	30	40
FDI	30	4.46	2.3894	-0.2233	9.4181
TRADE	30	68.735	8.3661	56.121	86.209
POPG	30	3.0369	0.3498	2.4283	3.5711
EDUC	30	98.391	12.129	80.441	117.85

Source: Author's own estimation

Empirical Strategy

The study employed both Ordinary Least Squares (OLS) and Two-Stage Least Squares (2SLS) methods using an Instrumental Variable (IV) to estimate the impact of CIT on economic growth in Zambia. The adopted model specification is based on the study of Lee & Gordon (2005) who studied the impact of tax structure on economic growth, using cross-country data for the period 1970–1997.

OLS Model

To estimate the impact of CIT on economic growth in Zambia, the study employed an econometric model that captures the relationship between CIT and the natural logarithm of GDP per capita. The basic form of the model was expressed as follows:

$$LGDPC_t = \beta_0 + \beta_1 CIT_t + \beta_2 PIT_t + \beta_3 FDI_t + \beta_4 POPG_t + \beta_5 EDUC_t + \beta_6 TRADE_t + \varepsilon_t \quad (1)$$

[1] Gross enrollment ratio for primary school is calculated by dividing the number of students enrolled in primary education regardless of age by the population of the age group which officially corresponds to primary education.

Where:

- *LGDPPC* is the natural log of GDP per capita,
- *CIT* is the top statutory corporate income tax rate,
- *PIT* is the top statutory personal income tax rate,
- *FDI* represents net inflow of foreign direct investment,
- *POPG* is the population growth rate,
- *EDUC* denotes primary education enrolment,
- *TRADE* is the international trade index,
- ϵ is the error term,
- *i* represents the country.
- *t* is the time period.

2SLS Model

One of the challenges in establishing the impact of CIT on economic growth is the possible reverse causality (Gechert & Heimberger, 2022). This may arise from the fact that periods of low economic growth may influence the government to reduce CIT rates to incentivize investments and economic activities. Similarly, periods of high economic growth may lead to high demand for infrastructure development, leading to tax rates hike (Lee & Gordon, 2005).

To address reverse causality, the study adopted the 2SLS method using an IV to estimate the impact of CIT on economic growth in Zambia. The instrument was the average regional CIT rate computed as the weighted average CIT rates in the neighboring countries[2], weighted by the inverse of distance between Zambia and the neighboring countries. By comparing Zambia's CIT rates with those of neighboring countries, adjusted for geographical proximity, this methodology assumes that while regional CIT rates may be similar, regional averages provide a reliable benchmark for understanding Zambia's taxation policies. Additionally, Zambia's smaller economy is less likely to influence tax policies in regional economies. Robustness checks were conducted to ensure that the IV meets the instrument validity assumptions.

The IV approach involves the two stage least square (2SLS) estimation. In the first stage, the endogenous variable, CIT rate, is regressed on all exogenous variables, including the IV (that is, the average regional corporate income tax rate). The first-stage regression can be expressed as follows:

$$CIT_t = \alpha_0 + \alpha_1 ZAVG_t + \alpha_2 PIT_t + \alpha_3 FDI_t + \alpha_4 POPG_t + \alpha_5 EDUC_t + \alpha_6 TRADE_t + v_t \quad (2)$$

Where:

- *Zavg* represents the average regional corporate income tax rate,

The considered countries where; Angola, Botswana, Congo DR, Lesotho, Mozambique, Malawi, Namibia, Eswatini, Tanzania and Zimbabwe.

- *vt* is the error term.

In the second stage, the original structural equation is estimated using the predicted values obtained from the first stage as instruments for the endogenous variable. The equation can be expressed as:

$$LGDPC_t = \beta_0 + \beta_1 CIT\hat{}_t + \beta_2 PIT_t + \beta_3 FDI_t + \beta_4 POPG_t + \beta_5 EDUC_t + \beta_6 TRADE_t + \varepsilon_{it} \quad (3)$$

Where:

- *ut* is a new error term.

This two-step process allows for a more accurate estimation of the causal-effect of CIT on economic growth by addressing endogeneity concerns.

FINDINGS

Table III below presents study findings on the impact of CIT on economic growth in Zambia using both OLS and IV approach.

Table 3: Main Results: OLS and IV

	(1)	(2)	(3)	(4)
VARIABLES	**OLS**	**OLS**	**IV**	**IV**
CIT	-0.054**	-0.037**	-0.134***	-0.119***
	(0.024)	(0.017)	(0.043)	(0.035)
PIT		0.013		0.016
		(0.009)		(0.012)
FDI		-0.013	-0.003	0.006
		(0.013)	(0.017)	(0.017)
TRADE		0.014***	0.014***	0.013***
		(0.002)	(0.003)	(0.003)
POPG		0.414***	0.493***	0.526***
		(0.128)	(0.179)	(0.163)
EDUC	0.010***	-0.003	-0.003	-0.007
	(0.003)	(0.004)	(0.005)	(0.005)
Constant	7.800***	5.875***	9.508***	8.640***
	(0.871)	(0.648)	(1.532)	(1.249)
Observations	30	30	30	30
R-squared	0.434	0.824	0.550	0.646

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Discussion

As it can be seen from table 3 above, both the OLS and IV estimation show that higher CIT rates are associated with lower economic growth rates in Zambia. The coefficients for both OLS and IV estimations show notable differences in their values. Column 1 presents OLS results with education as the only control variable and the coefficient of CIT was negative and statistically significant. The coefficient of CIT indicates that a 10 percent decrease in top statutory CIT rate is associated with 0.54 percent increase in GDP per capita growth and vice versa.

Column 2 presents OLS estimates when personal income tax, foreign direct investment, trade, population growth and education are control variables to the model. Notably, the coefficient of CIT reduces to 0.037 from 0.053, in absolute terms, suggesting a positive bias in model 1, that is, Omission Variable Bias (OVB).

In columns 3 and 4 of the results presented, the study provides the IV estimates for the impact of CIT on economic growth in Zambia. Both coefficients are statistically significant at 1 percent level of significance, suggesting a strong negative relationship between CIT and economic growth. In column 3, the coefficient for the CIT is -0.134, implying that a 10 percent decrease in the top statutory CIT rate is associated with approximately a 1.34 percent increase in GDP per capita growth and vice versa. When the top statutory personal income tax rate is added to the model as shown in Column 4, the coefficient reduces to 0.119 (in absolute terms). This means that a 10 percent decrease in the top statutory corporate tax rate is associated with approximately a 1.19 percent increase in GDP per capita growth and vice versa. The larger magnitude of the coefficient in column 3 indicates a more pronounced effect when fewer control variables are included.

A notable feature from the empirical analysis is that the OLS coefficients for CIT are relatively small and suggest a weak negative relationship between CIT and economic growth. In contrast, the IV coefficients are significantly larger in magnitude, indicating a stronger negative impact of corporate tax rates on economic growth.

One of the primary reasons for the difference in coefficients is the issue of endogeneity in the OLS estimation. In OLS, the relationship between corporate tax rates and economic growth may be biased due to omitted variable bias, measurement error or reverse causality. For instance, economic growth rates in Zambia could influence tax policy decisions, leading to a situation where higher growth rates result in lower tax rates, thus confounding the empirical results.

The 2SLS model addresses these endogeneity concerns by using an IV, in this case, the average regional corporate income tax rate, that is correlated with the top statutory corporate income tax rate but not directly with the error term in the growth equation. This method provides a more accurate estimate of the causal effect of CIT on economic growth. The larger negative effects (as seen from the coefficients) from the IV estimation suggest that when controlling for endogeneity, the true impact of CIT on growth is more pronounced than what OLS suggests. Additionally, the IV coefficients are statistically significant at 1 percent level of significance compared to the OLS coefficients, which are significant at 5 percent level. This further emphasizes the reliability of the IV results in capturing the true impact of CIT on economic growth.

The empirical results presented in table 3 above indicate that various control variables have significant effects on economic growth in Zambia, aligning with predictions from economic theory and existing empirical studies. For instance, the coefficients for trade are positive and statistically significant across all models, suggesting that increased trade activity contributes positively to economic growth. This finding is consistent with economic theory, which posits that trade can enhance growth by providing access to larger markets, promoting competition, and facilitating the transfer of technology and knowledge (Frankel & Romer, 1999). Additionally, the positive relationship between population growth and economic growth, as indicated by the significant coefficients, supports the notion that a growing population can lead to a larger labor force and increased demand for goods and services, thereby stimulating economic activity.

On the other hand, the results show that the impact of education on economic growth in Zambia is complex and varying. While the coefficient for education is positive in the first model, it becomes insignificant in subsequent models that include additional control variables. This suggests that the impact of education on economic growth may be mediated by other factors, such as trade and investment.

The results also show that the top statutory personal income tax has no significant impact on economic growth in Zambia, which can be attributed to several potential factors. One possible factor is regarding tax structure and compliance. The effectiveness of personal income tax in influencing economic growth may be limited by the structure of the tax system and the level of tax compliance. If a significant portion of the population is not subject to the top statutory rates due to exemptions, deductions, or a large informal economy, the overall impact of personal income tax on economic growth may be minimal (Bird & Zolt, 2005). In Zambia, where informal employment is prevalent, many individuals may not pay personal income taxes, reducing the tax's influence on overall economic activity (Zambia Statistics Agency, 2024).

Regarding FDI, the empirical results in Table 3 indicate that FDI has no significant impact on economic growth in Zambia, which can be attributed to several potential factors. One possible explanation is that FDI in Zambia is concentrated in specific sectors, namely mining. The mining sector often operates in isolation from the rest of the economy and generates limited forward and backward linkages with domestic industries. As a result, the potential for technology transfer, skills development and productivity spillovers to other sectors are limited. This limited spillover effect may explain the minimal impact of FDI on overall economic growth.

Another factor contributing to the insignificant effect of FDI on economic growth in Zambia may be due to repatriation of profits: Foreign investors often repatriate a significant portion of their profits back to their home countries. This outflow of capital can negate some of the potential benefits of FDI for the host country. If a large share of the profits generated by foreign investments is not reinvested in the local economy, the overall impact on economic growth may be diminished.

Robustness Tests

To ensure the reliability of our findings, we conducted robustness checks focusing on endogeneity, instrument validity, and instrument strength. The results are discussed below.

Endogeneity Test

To assess the potential endogeneity of CIT, we performed the Durbin-Wu-Hausman test. The null hypothesis is that CIT is exogenous while the alternative hypothesis is that CIT is endogenous. The outcome of endogeneity test was as follows:

Table 4: Tests of Endogeneity

Ho: variables are exogenous

Test	Statistic	Degrees of Freedom	P-value
Durbin (score) chi^2	16.7447	(1)	0.0000
Wu-Hausman F	27.7913	(1, 22)	0.0000

Source: Author's own illustration

Since the P-values of both Durbin and Wu-Hausman are less than 0.05, we reject the null hypothesis, confirming that CIT is endogenous. The results suggest that changes in Zambia's CIT are influenced by factors that also affect economic growth, making it difficult to establish

a clear causal relationship. This necessitates the use of IV approach to obtain unbiased estimates.

First-Stage Regression Analysis

To address endogeneity concerns, the study employed the 2SLS method using the average regional CIT rate as an instrument for top statutory corporate income tax. This instrument is constructed as the weighted average CIT rates for Zambia's neighbouring countries, with weights based on the inverse of the distance between Zambia and these countries. The rationale behind this choice is that while regional tax rates may be correlated with Zambia's CIT, Zambia's relatively smaller economy is unlikely to influence regional tax policies significantly.

Table 5: First-Stage Regression Summary Statistics

Variable	R-sq.	Adjusted R-sq.	Partial R-sq.	F(1,23)	Prob > F
CIT	0.5236	0.3994	0.3574	12.7903	0.0016

Source: Author's own illustration

Table 6: Weak Instruments Test Results

2SLS relative bias	5%	10%	20%	30%
		(not available)		
	10%	15%	20%	25%
2SLS	16.38	8.96	6.66	5.53
LIML	16.38	8.96	6.66	5.53

Source: Author's own Illustration

The F-statistic for the first-stage regression is 12.7903, which is well above the critical value 10. This means that the null hypothesis that the instruments are weak is rejected (Stock and Yogo, 2002). This implies that the instrument is strong and effective in predicting the endogenous variable, CIT.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study analyzed the impact of CIT on economic growth in Zambia using a quantitative approach with time series data from 1994 to 2023. The research employed both Ordinary Least Squares (OLS) and Two-Stage Least Squares (2SLS) estimation techniques to address potential endogeneity concerns. The study included FDI, trade, education and population growth as variables to provide a comprehensive assessment of the impact of CIT on economic growth.

The empirical findings reveal a statistically significant negative impact of CIT on economic growth in Zambia. OLS estimates suggest that higher CIT rates are associated with slower GDP per capita growth, though the magnitude of this effect is relatively small. However, the IV approach yields larger negative coefficients, reinforcing the argument that CIT exerts a substantial adverse effect on economic growth when endogeneity is accounted for. Specifically, the IV results indicate that a 10 percent reduction in the corporate tax rate could lead to an increase in GDP per capita growth by approximately 1.19 to 1.34 percent. The negative relationship between CIT and economic growth aligns with existing literature that suggests high corporate taxes can deter investment and reduce the incentives for businesses to expand (Lee & Gordon, 2005; Djankov et al, 2010, Arnold et al, 2011).

The findings of the study are particularly relevant in the context of Zambia, where the economy is heavily reliant on sectors such as mining and manufacturing. These sectors are highly

sensitive to changes in corporate taxation and exposure to international competition. A high corporate income tax burden can discourage reinvestment by reducing after-tax profits, limiting the capacity of firms to expand, innovate or create jobs. In turn, this dampens productivity and slows overall economic growth. Furthermore, high CIT rates may incentivize profit-shifting or capital flight, particularly in the mining sector, where multinational firms dominate and have access to cross-border tax planning strategies. Given the pivotal role these sectors play in Zambia's export earnings, employment and development, the observed negative effect of CIT on economic growth is economically justifiable. As such the negative relationship between CIT and economic growth observed in the study is therefore consistent with theoretical expectations and empirical trends in resource-dependent, developing economies like Zambia.

The study also highlights other important determinants of economic growth in Zambia. Trade openness exhibits a positive and statistically significant effect on GDP per capita, suggesting that increased international trade enhances economic performance. Population growth also demonstrates a positive impact, reflecting the potential for a larger labor force and increased economic activity. However, the role of education appears complex, as its effect on economic growth is inconsistent across different model specifications. Personal income tax rates were found to have no significant impact on economic growth, possibly due to structural factors such as tax compliance and the prevalence of the informal economy. Furthermore, foreign direct investment does not exhibit a statistically significant relationship with economic growth, which may be attributed to limited spillover effects and the repatriation of profits by foreign investors.

Recommendations

Given the strong negative relationship between CIT and economic growth, policymakers should consider lowering the statutory corporate tax rate to enhance investment incentives. A reduction in CIT rates can encourage business expansion, attract investment and boost job creation. To offset potential revenue losses from reduced CIT rates, the government should focus on broadening the tax base by improving tax compliance, reducing tax exemptions, and formalizing the informal sector.

Additionally, the positive and significant effect of trade on economic growth suggests that policies promoting trade liberalization should be prioritized. Zambia should strengthen its participation in regional and international trade agreements, such as the African Continental Free Trade Area (AfCFTA). This may be complemented by investments in transport, logistics and border efficiency to enhance Zambia's integration into global markets and support export-led growth. On the other hand, the mixed findings on education's impact on growth suggest that Zambia must focus not only on increasing access to education but also on improving quality and relevance. Aligning education policies with labor market needs, particularly in science, technology, and vocational training, will enhance productivity.

Author Contributions

Gregory Phiri: Conceptualization; formal analysis; investigation; writing original draft; writing review and editing. **Chilizani Phiri:** Formal analysis; investigation; writing original draft; writing review and editing. **Boyd Mwila Lumbwe:** Literature review; writing review and editing.

Conflict of Interest Statement

The authors declare no conflict of interest.

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