Institutional quality, domestic resource mobilization, and economic growth in Zambia: A quantitative ARDL analysis (1990–2021)

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ABSTRACT

This study empirically investigates the long-run and short-run determinants of economic growth in Zambia. It focuses on the roles of institutional quality and domestic resource mobilization (DRM). Utilizing an Autoregressive Distributed Lag (ARDL) bounds testing approach on annual time-series data from 1990 to 2021, the research quantifies the impact of governance indicators (control of corruption and rule of law) and fiscal instruments (tax and non-tax revenue) on Gross Domestic Product (GDP) per capita. The results reveal a significant long-run positive relationship between non-tax revenue and economic growth. However, tax revenue exhibits a negative coefficient (β=-0.99), suggesting potential inefficiencies or distortionary effects in the current tax system. Furthermore, institutional quality, specifically law and order and control of corruption, is found to be a significant positive driver of long-term growth. The study concludes that improving institutional quality, digitizing revenue collection, and diversifying domestic revenue sources are critical for sustainable economic development in Zambia. Quantitative evidence necessitates a paradigm shift in fiscal policy, emphasizing substantial institutional reforms above mere rate adjustments. Law & Order has a high elasticity (+2.26); therefore, for growth, there's a need to increase judicial independence, contract enforcement, and anti-corruption measures. Digitizing revenue systems should be done promptly. At the same time, tax administration needs to restructure to a bottom-heavy model that makes the informal sector tax compliant to grow the tax base without raising tax rates. Further, revenue collection can be improved by modernizing non-tax instruments like digitizing mineral royalties' collection and systematically converting customary land to state land, which can open up stable, scalable revenue streams from the underutilized assets.

Keywords: ARDL, Domestic Resource Mobilization, Economic Growth, Institutional Quality, Zambia

I. INTRODUCTION

For developing economies like Zambia, achieving sustainable economic growth is inseparably linked to the ability to mobilize domestic resources effectively (Uddin, et al., 2023). As noted by the International Monetary Fund (2023), domestic resources provide the largest untapped source of financing for national development plans (Ekori & Masumbe, 2022 ; Oyinlola, et al., 2020; Seck, 2020). However, this fiscal problem needs to be understood in the context of a wider concept of development (Sen, 1999), significantly redefines the objective of economic systems, positing that development transcends mere GDP growth to encompass the enhancement of human capabilities and meaningful freedoms. These are the things that allow people to live lives they value (Sen, 1999). From this perspective, revenue mobilization is not an end in itself, but a method of loosening the "chains" of poverty, poor public services, and economic insecurity (Mukelabai & Haabazoka, 2024; Babatunde, et al., 2017; Sen, 1999). Sen's framework stresses that social institutions, including the judiciary, the civil service, and fiscal management, contribute to development by strengthening individual liberties, and are in turn sustained by the social values they promote International Monetary Fund [(IMF], 2023). This cyclic link between institutional quality and developmental outcomes lies at the centre of the present inquiry.

The effectiveness of fiscal policy is dependent on the quality of the institutions in which it functions. Besley and Persson (2014), in their foundational examination of the reasons behind the little taxation in developing nations, illustrate that poor institutions, fragmented political systems, and insufficient transparency are not only concurrent issues but fundamental causes of diminished revenue potential. These are prominent even in the Zambian situation, therefore, Besley and Persson (2014) framework underscores the reciprocal interactions among political, social, and economic factors. The state's deficient in institutional capacity to enforce contracts and limit expropriation concurrently face challenges in fostering the fiscal compliance and national identity essential for sustainable taxation and resource

mobilization as a whole. Hickey and Sen (2024) build on this idea with their "political settlements" approach. They take the stand point that the way political and economic elites make deals, whether they are open/ closed, ordered/ disordered, has a big effect on both growth paths and the ability of bureaucrats to manage natural resources well. For nations like Zambia, where mineral wealth exists with a tax-to-GDP ratio that remains stagnant at around 16.2 percent (Readhead, 2016), just a notch higher than the 15 percent "tipping point" deemed essential for poverty alleviation and investment in human capital, these institutional deficiencies result in severe budgetary repercussions for the country. From the above, therefore, this paper tackles two core research problems crucial to explaining this tax collecting stagnation. This stagnation is a vital part in the growth of Zambia since failing to improve the revenue take, leads in continuing stay in poverty.

1.1 Statement of the Problem

Zambia's domestic revenue mobilisation (DRM) has been inadequate for over 25 years, accounting for only sixteen percent (16.7%) of the tax-to-GDP ratio (Readhead, 2016). This revenue collection level narrowly achieves the fifteen percent (15%) threshold deemed minimal for financing fundamental state operations (Readhead, 2016), resulting in insufficient resources to support Zambia's development agenda, liquidate debt, or effectively advance the Sustainable Development Goals (SDGs). This revenue deficit, however, is at the backdrop of the creation of various DRM institutions and policies, perpetuating a cycle of poverty and dependence on unstable external financing. This is a vulnerability vividly exemplified when corruption resulted in the withholding of US$ 273 million in health sector aid. Such a harsh reality contrasts with the ideal of efficient, transparent, and accountable institutions capable of generating adequate domestic resources to finance the needs of the country without reliance on debt or aid (Readhead, 2016).

The consequences of this insufficient DRM for national financing are significant and complex. Moreover, inadequate administrative enforcement mechanism cultivates a culture of low tax compliance, fraud, and evasion (Lungu & Mungule, 2023). In Zambia's case, this is demonstrated by consistently low Value Added Tax (VAT) collections (Lungu & Mungule, 2023). Hence leading to persistent revenue shortfalls, compelling Zambia to incur unsustainable debt to fund public services and infrastructure development. Our study, seeks to examine the impact of the quality of DRM institutions on Zambia's economic growth and aims at identifying the fundamental causes of institutional inefficiencies and policy failures.

The objective of our study is to ascertain the impact of DRM institutions on Zambia's economic growth and to identify the primary factors contributing to institutional inefficiency and policy failures. In so doing, propose pragmatic strategies to enhance revenue administration and formulate effective policies to empower Zambia to finance its development agenda and attain sustainable economic growth.

1.2 Research Questions

i. What is the long-run cointegrating relationship between institutional quality and GDP per capita?
ii. To what extent does a change in tax and non-tax revenue statistically influence GDP per capita growth?

II. LITERATURE REVIEW

2.1 Theoretical Review

The study draws on New Institutional Economics (NIE) and Endogenous Growth Theory (EGT) to explain the transmission mechanisms between governance, domestic revenue, and growth. The two theories explain both the rigidities and help in policy formulation to improve economic growth. From an NIE perspective, institutions are not merely background conditions but proximate determinants of economic performance.

NIE posits that institutions are the "rules of the game" as they are fundamental determinants of economic performance (North, 1990; Rodrik, et al., 2004; Ricks & Doner, 2021; Majekodunmi, 2023; Tagem & Morrissey, 2023). Effective institutions reduce transaction costs, enforce contracts, and secure property rights, thereby encouraging investment and productivity (Acemoglu et al., 2005). In the context of Domestic Resource Mobilization (DRM), high institutional quality minimizes leakages and enhances tax compliance and improves revenue collection for financing economic growth (World Bank, 2025 ; Readhead, 2016 ; Uddin, et al., 2023; Bah, 2024; World Bank, 2024).

Endogenous Growth Theory (EGT) emphasizes that internal factors, such as public policy and efficient resource mobilization, drive long-term growth (Romer, 1994; Lucas, 1988). Unlike neoclassical models that view technology as exogenous, this framework suggests that government revenue, if efficiently collected and invested in public goods and investments, contributes directly to the production function within the economy (Barro, 1990 ; Aghion & Howitt, 1997). From these theories, an economy is expected to perform well and be self-reliant from its own domestic revenue as opposed to depending on external financing sources which may come with conditionalities or cross border demands. A well established and high-quality institutional framework would produce better endogenous outcomes without depending on external resources. As Li et al. (2020) propounded, economic growth would be most likely achieved with well-established endogenous economic institutions. Our quantitative analysis, therefore, tests the hypothesis that both

institutional quality (as a proxy for transaction efficiency) and DRM as a proxy for internal capital formation, are significant predictors of GDP per capita in Zambia. It is, therefore, from this theoretical framework that policy interventions can originate and influence economic growth positively.

As has been noted in Section 2 above, NIE focuses on institutions with emphasis on the rule of law, contract enforcement, and constraints on expropriation which reduces transaction costs and shape the incentive structures that govern productive investment and fiscal exchange. Besley and Persson (2014) formalize this logic, demonstrating that state capacity for taxation co-evolves with legal and political institutions; weak institutional environments produce low-revenue equilibria that constrain developmental investment.

From an EGT standpoint, institutional quality enters directly into the production function: predictable property rights and impartial contract enforcement lower uncertainty, raise the marginal product of capital, and accelerate innovation and human capital accumulation (Acemoglu, et. al, 2005; Romer, 1994). Accordingly, the expected relationships are twofold: (i) a positive, long-run cointegrating relationship between institutional quality and GDP per capita, mediated through investment and productivity channels; and (ii) a conditional relationship between tax revenue and growth, positive where administrative efficiency and rule of law are strong, but potentially negative where compliance costs and distortions outweigh public good provision. Non-tax revenue, by contrast, is predicted to exert a positive influence if it diversifies the fiscal base without increasing institutional biases.

2.2 Empirical Review

This section examines the current empirical literature to contextualise the two main research questions for this study: analysing the long-term cointegrating relationship between institutional quality and GDP per capita, and assessing the degree to which variations in disaggregated tax and non-tax revenues statistically affect economic growth.

2.2.1 Global and African Evidence on Institutions-Growth and DRM-growth links

Globally, Acemoglu et al. (2001) established the primacy of institutions over geography that was put forward by Diamond (1999) in determining long-run growth. As was initially proposed by Douglas North (1990). This has however led many researchers on the institutional perspective leading a number of results and empirical outcomes that support the institutional perspective, especially with the natural experiments in the world (Beyaert et al., 2023 ;) Uddin et al., 2021; Mehlum, et al., 2006). This clearly brought to the fore the de jure (institutional), and de facto (political power) in establishing institutions. This leads to dependence on efficiency and distribution controlled politically (Acemoglu, et al., 2005). It is on this stance that policy recommendations can show improvements that can result when institutions that support endogenous growth, are established and are of good quality. Although some head ways have been made in Africa's position on how institutions can be made better, there are methodological and population gaps in African studies as compared to Zambia. In the African context, studies by Oyinlola et al. (2020) and Bah (2024) have used panel data to demonstrate that governance indicators like control of corruption and rule of law significantly enhance tax revenue collection. Specifically, Bah (2024) found that institutional quality positively moderates the impact of tax revenue on economic growth across Sub-Saharan Africa. Even though this can be extended to Zambia, there is a need to look at Zambia's perspective.

The above literature review of global and African perspective, underscores the theoretical and empirical primacy of institutional quality as a fundamental determinant of long-run economic growth, a paradigm proposed by the foundational work of North (1990: 1994) and Acemoglu et al. (2001; 2005). Within the African context, studies such as those by Oyinlola et al. (2020), Majekodunmi (2023) and Bah (2024) have extended this trajectory by demonstrating that specific governance indicators of the control of corruption and the rule of law, significantly enhance the capacity of tax revenue to foster economic development. However, while these panel studies confirm a positive moderating effect of institutions on revenue and growth across the continent, they highlight a critical gap in country-specific analyses. It is within this context that the present study is situated. This research seeks to bridge the gap by moving beyond general regional trends to investigate the specific mechanisms at play in Zambia using ARDL model as opposed to Generalized Method of Moments (GMM) which is based on panel data unavailable in Zambia. It aims to determine what is the long-run cointegrating relationship between institutional quality and GDP per capita in the country, and further, to what extent changes in both tax and non-tax revenue statistically influence GDP per capita growth. By applying the institutional framework to Zambia's unique fiscal landscape, this study will not only test the applicability of the broader African findings to a national case but also provide the empirical evidence necessary for crafting targeted policy interventions. Furthermore, global literature confirms that revenue mobilization cannot be divorced from this institutional context as Bird et al. (2008) demonstrate that statistical influence of tax collection on growth is heavily dependent on the quality of governance institutions.

Zambian Perspective: Specifically, in Zambia, the literature is more fragmented and there is lack of data in line with the methods used at the continent level. Local literature on these issues is also limited in method, scope and targeting. Chipimo (2014) analysed financial sector contributions to endogenous growth of Zambia but did not integrate total DRM. Zulu (2016) linked property rights to growth but focused less on the fiscal transmission channels. Unceta

(2021) highlighted the volatility of the mining tax regime but lacked a comprehensive econometric analysis of how this instability interacts with broader governance metrices to affect long-term growth. Seck (2020) investigated institutional failures by focusing on Value Added Tax (VAT) refund system that fails to meet the statutory obligations of refunding businesses within 30 days, but pays, in some instances, after over 800 days. Such institutional failures have a significant negative impact on tax compliance, trust and DRM. Further, the unrefunded amount, owed by the revenue authority, keep. This leads to increases in allocation, by the treasury, of VAT refund amounts to try and exhaust the backlog (Lungu & Mungule, 2023). Sadly, there is no interest for the lost time on amounts unpaid and reduces the value for money for tax payers (Lungu & Mungule, 2023). Much as the studies may produce recommendations to increase the amount available for refunds, there is a competing need to finance the economy.

Much as the global, African and Zambian literature that we see that there is no focus on institutional arrangements and DRM in Zambia, that this gap should be filled. It is from this, that a perspective that provides a way to not only stop the accumulation of the non-refunded VAT amounts, but also provide ways in which Zambia can improve its DRM. This can be done by filling the gaps in literature.

The specific interaction between governance failures, such as, corruption and the efficiency of tax collection has not been adequately quantified for Zambia. For instance Lungu and Mungule (2023) looked at the impact of unpaid VAT refunds but did not perform an econometric link to aggregate economic stagnation. Conversely, Kufanga (2024) looked at the impact of VAT on Zambia's revenue collection, but addressed only a single tax type rather than the broader theoretical perspective of DRM's impact on endogenous growth. Additionally, none of the works have addressed the non-tax perspective of DRM. Furthermore, earlier literature often assumed all taxation is growth-enhancing, ignoring evidence that in developing contexts with weak institutions, taxation can exert a fiscal drag (Choi, 2012).

Despite the existing body of knowledge on DRM and influence of institutional quality in Africa, significant gaps remain that this study aims to address:

Methodological Gap: Most existing studies on DRM and institutions in Africa, such as Bah (2024), Oyinlola et al. (2020) and (Nikiema & Zore, 2025) rely on panel data methods like GMM. While powerful for cross-country analysis, GMM assumes homogeneity across nations that may obscure country-specific institutional rigidities (Nikiema & Zore, 2025; Uddin, et al., 2023; Oyinlola, et al., 2020) in each of the countries. For a country like Zambia, where long-term disaggregated provincial data is unavailable, panel methods are inapplicable. This study, therefore, fills this methodological gap by employing the ARDL bounds testing approach, which is robust for single-country, small-sample time-series data and handles mixed integration orders (Hussein & Hmood, 2024; Uddin, et al., 2023) .

Contextual Gap: Previous studies on Zambia, have often treated tax revenue as a homogeneous block or focused solely on mining taxes with a resource curse tag (Readhead, 2016; Unceta, 2021). There is a lack of rigorous quantitative analysis that disaggregates DRM into tax and non-tax revenue to assess their distinct impacts on growth effect under the conditioning influence of institutional quality. This would better channel policy formulation and targeting. This study, therefore, addresses this gap by explicitly modelling both revenue streams of tax and non-tax. This approach will not produce a combined outcome, but ensures that each revenue stream's characteristics are taken on board for analysis and policy formulation.

Theoretical Gap or Analytical Gap**:** The specific interaction between governance failure, like corruption and the efficiency of tax collection (manifesting as a negative growth coefficient) has not been adequately quantified for Zambia. For instance, Lungu and Mungule (2023) looked at the impact of the unpaid VAT refunds but failed to address the causes of the failure in having refund amounts owed in the first place. Conversely, Chipimo (2014) analysed financial sector contributions to DRM but did not address other DRM streams. From this, there's a disaggregated approach to DRM in Zambia with no focus on the theoretical perspective of addressing the DRM as a whole. Kufanga (2024) looked at the impact of VAT on Zambia's revenue collection. This too addressed a tax type and not the theoretical perspective of DRM. All these studies do not look at the effect of the DRM on growth perspective in order to isolate the entire negative effect due to failures in the DRM perspective. Our study seeks to provide empirical evidence for this "tax paradox," where taxes are collected but are not fully meeting the funding needs of the nation. Therefore, institutional effects on DRM will be analysed in a way that would produce areas of intervention. These gaps identified will be filled in this study. This will be done by selecting a methodology that takes into account all the gaps that have been presented.

III. METHODOLOGY

3.1 Research Design

This study adopted a pragmatist paradigm, employing a mixed-methods research design to comprehensively investigate the relationship among DRM, institutional quality, and economic growth. From this, quantitatively, we utilized an explanatory sequential time-series design applying the Autoregressive Distributed Lag (ARDL) bounds testing approach to establish both short- and long-run cointegrating relationships among the macroeconomic variables. Qualitatively, this was complemented by a descriptive longitudinal document analysis. This mixed-methods approach allowed the study to first establish the statistical impact of DRM on GDP, which is the "what" and then utilize

institutional frameworks to contextualize the administrative frictions driving those econometric outcomes as the "why." In our study, the qualitative data came from the Zambia Association of Manufacturers data on VAT refund. This was complimented by analysis of the Auditor General reports.

3.2 Study Area

Our study area is Zambia, using the macro perspective of the economic and institutional variables.

3.3 Target Population

The target population is the whole population of Zambia based on economic data utilized. There is also a focus on manufacturers based on secondary data from the Zambia Association of Manufacturers, Auditor General reports and their interactions with revenue institutions.

3.4 Sampling Procedure and Sample Size

This was a secondary data research with no primary data collection.

3.5 Data Collection Instruments and Procedure

The study utilizes annual time-series data of GDP and revenues covering the period 1990 to 2021. This data is obtained from the World Bank World Development Indicators (WDI). Further, institution quality data (control of corruption and rule of law) is obtained from the International Country Risk Guide (ICRG) (Parsons & Rabhi, 2025). The selection of the time frame was determined based on the availability of the data required for our variables of interest. Specifically, institutional variables as these are key to this study. Even though the economic data had a longer time span, the institution variables had a short period for Zambia. Other Governance Indicators (GI) databases had a shorter period of institutional variables for Zambia and, therefore, could not be used. We instead found the ICRG data that started in 1990 and hence offered a longer period.

Apart from a longer time period, the ICRG offers a number of institutional data variables and we settled for control of corruption and the rule of law due to the perspective in the study. The interactions of these variables and influence on the domestic resource mobilization are critical in development of Zambia. In achieving the objectives of this study, descriptive approach was used to describe the variables of the study. This will then be followed by econometric analysis using the economic data and institutional data.

Table 1

Descriptive Statistics

	Mean	STD	Min	25%	50%	75%	Max
GDPPCap	5892.216682	6240.33688	14.556581	674.1291128	3481.45526	9997.889943	22564.0534
ICRGCorrpt	2.7021875	0.578154653	2	2.1375	2.67	3	4
ICRGLawOrder	3.7240625	0.716676286	1	4	4	4	4
TaxRev	14760841363	19156354606	22081900	1026775000	5902235624	22866036500	74225937509
NonTaxRev	2779633154	4891757561	1048500	50512000	194891571.7	3179437250	22943954460

The dependent variable, which is, the Log of GDP per capita (constant LCU) ($lnGDPPCap$), was sourced from the WDI. Independent Variables included: *Log of Tax Revenue* ($lnTaxRev$) - Total tax revenue, also sourced from WDI, *Log of Non-Tax Revenue* ($lnNonTaxRev$) - fees, fines, and royalties from WDI, finally, *Institutional Quality variables* that are Control of Corruption ($ICRGCorrpt$) and Law & Order ($ICRGLawOrder$) indices were sourced from the ICRG (Parsons & Rabhi, 2025). A crucial step to time series data analysis is to check for stationarity of the variables. This is because stationary data has stable mean and variance over time. Non-stationary data leads to unreliable models. It is, therefore, important to ensure the results are reliable and stable by ensuring the data is stationary. This is to ensure that the statistical properties of mean, variance and autocorrelation are constant over time. Augmented Dickey-Fuller (ADF) test is used to check for stationarity (Hussein & Hmood, 2024 ; Uddin et al., 2021 ; Stoian & Iorgulescu, 2020; Alimi, 2014). The ADF test was applied to the variables to check for stationarity (Hussein & Hmood, 2024 ; Stoian & Iorgulescu, 2020 ; Uddin et al. 2021 ; Olayungbo & Adediran, 2017 ; Pesaran, et al., 2001 ; Engle & Granger, 1987). The ADF results are shown below:

Table 2

Augmented Dickey-Fuller (ADF) Test

Variable	Level p-value	First Difference p-value	Order of Integration
log_GDPPCap	0.22	0.01	I(1)
log_TaxRev	0.29	0.01	I(1)
log_NonTaxRev	0.05		Borderline I(0)
ICRGCorrpt	0.04		I(0)
ICRGLawOrder	0.01		I(0)

The mixed order of integration $(I(0) \wedge I(1))$ justifies ARDL modelling because it robustly handles mixed integration orders (Hussein & Hmood, 2024). The flexibility of handling both orders makes ARDL an ideal tool to use in the analysis. This is important as there would be no need to work on the variables to make them stationary if it was found that the economic variables were of different orders.

3.6 Data Analysis

Model Specification

In order to preserve the long-run information in modelling is very important. This will ensure that the correct output is received. To this effect, co-integration is used to detect short-run and long-run relationships among variables (Engle & Granger, 1987). An Autoregressive Distributed Lag (ARDL) bounds testing approach (Pesaran, et al., 2001) is employed to this analysis due to its suitability for small sample sizes and mixed integration orders ($I(0)$ and $I(1)$) (Engle & Granger, 1987). It should be noted that testing for cointegration, in an econometric model, is a necessary step in finding out the short run and long run meaningful relationships of variables. The cointegration of two or many variables implies that there is a long-run relationship between or among those variables (Engle & Granger, 1987). ARDL has time series variables and values of explanatory variables and their respective lags of one or more periods.

Equation 1: ARDL Equation

$$\Delta ln(GDP)_t = \alpha_0 + \Psi GDP_{t-1} + \theta GDP_{t-1} + \sum_{i=1}^{p} \beta_{1i} \Delta ¥_{\{t-i\}} + \sum_{i=0}^{q} y_i \Delta X_{\{t-1\}} + \lambda ECT_{t-1} + \epsilon_t$$

….. (1)

Where:

Δ: First difference of variables

θ, Ψ: represents long-run relationship coefficients

¥, y: represent short-run relationship

p, q: Number of lags that are not necessarily equal

ϵ : Error term with zero mean and constant variance with no serial autocorrelation

Error Correction Model (ECM)

The ECM is a dynamic system used to reconcile the behaviour of short-run economic fluctuations with long-run equilibrium relationships. It is grounded in the Granger Representation Theorem (Engle & Granger, 1987). It is the theoretical bridge that enables (provided the variables are cointegrated) non-stationary time-series data to be modelled effectively (Hussein & Hmood, 2024 ; Uddin et al., 2021 ; Stoian & Iorgulescu, 2020). Simply put, ECM is a regression specification that models the change in the dependent variable (ΔGDP_{t-i}) as a function of past changes in the independent variables (short-run dynamics) and the previous period's deviation from the long-run equilibrium (the error correction term). It acknowledges that while economic variables may drift apart due to shocks in the short term, fundamental economic forces (such as institutional quality or fiscal policy) will pull them back together in the long run. From this, therefore, the ECM specification is:

Equation 2: - Error Correction Model (ECM)

$$\Delta ln(GDP)_t = \alpha_0 + \sum_{i=1}^{p} \beta_{1i} \Delta ln(GDP)_{\{t-i\}} + \sum_{i=0}^{q} \gamma_i \Delta X_{\{t-1\}} + \lambda ECT_{t-1} + \epsilon_t$$

….. (2)

Where X represents the vector of independent variables (Tax, Non-Tax, Corruption, Law & Order), and ECT_{t-1} is the error correction term capturing the speed of adjustment.

The optimal lag lengths were selected using the Akaike Information Criterion (AIC).

Table 3

Akaike Information Criterion (AIC)

Model Order	AIC
ARDL(1,1,1,0,1)	-1.891
ARDL(2,1,3,0,2)	-2.103
ARDL(2,2,2,1,1)	-1.992
ARDL(3,1,3,0,2)	-2.002

Akaike Information Criterion (AIC) table of four models.

To determine the optimal lag structure for the Autoregressive Distributed Lag (ARDL) model, the Akaike Information Criterion (AIC) was employed as the primary model selection metric. The AIC serves as a rigorous standard for balancing goodness-of-fit against model complexity, effectively penalizing over-parameterization to ensure parsimony. In this analysis, multiple ARDL specifications were evaluated by iteratively adjusting lag orders for the dependent variable (p) and independent variables (q).

The comparative results demonstrated in the table above, the ARDL (2,1,3,0,2) specification yielded the lowest AIC value (-2.103) compared to alternative model structures. Consequently, this specific configuration, implying two (2) lags for GDP per capita, one (1) for tax revenue, three (3) for non-tax revenue, zero (0) for corruption, and two (2) for law and order, was selected as the optimal model. This selection minimizes information loss while maximizing the reliability of the estimated short-run dynamics and long-run coefficients. This selection was based on the fact that AIC estimates the quality of a model relative to other models. This is because AIC rewards goodness-of-fit or how well the model explains the data, and penalizes the complexity of the model, i.e. the adding too many lags in the model (Pesaran, et al., 2001). The selected model, therefore, provides a parsimonious fit as it captures the necessary dynamics of the Zambian economy without overfitting the data. Besides the statistical justification, the economic or theoretical issues can also be taken on board with real-world speed of adjustment for each variable.

Economic and theoretical justification of specific lags implies that the 2 lags of GDP per capita indicates that the current economic growth in Zambia is heavily influenced by the performance of the previous two years. Being a resource-dependent country, shocks such as changes in the copper price or time taken in mining investments to ripple through the system would justify the 2 lags; secondly, for tax revenue, there is rapid transmission mechanism. Tax policies in Zambia are enacted annually in the National Budget. The impact of a tax change is felt in the economy almost immediately. This is because the budget measures are approved in November and December and come into effect in January of the following year, which is within a month. A single lag, therefore, captures this fiscal cycle perfectly;

Thirdly, non-tax revenues on the other hand in Zambia, often come from various institutions and sources like land rates, toll fees, mineral royalties, SOE dividends, or fines. These flows are volatile and administrative collection varied and complex. It may take up to three or four years for changes in the revenue streams. The 3 Lags therefore indicates the lag or delayed transmission. It is therefore economically sound;

Fourthly, for corruption, there is an immediate impact. This is due to the fact that corruption increases transaction costs right there and then. The negative effect of a bribe for gratification of a services, for example, or theft of funds is felt instantly in the economy. The failure to fund a project implies that the project will not take off; and

Lastly, rule of law (law and order) has an institutional lag as it takes time for improvements in the legal framework or court systems to take effect. As a result, there can never be an overnight economic result from any changes in this. The 2 lags in the model, captures this very well and it is logically sound.

3.7 Ethical Considerations

Considering that our study employs an Autoregressive Distributed Lag (ARDL) econometric model combined with a qualitative review of historical documents, the research relies exclusively on secondary, publicly available data. The study also includes datasets that utilize macroeconomic indicators from supranational organizations that includes the World Bank, IMF and IRGC, domestic bodies that include ZRA, Zambia Association of Manufacturers, and published public financial management reports from the Office of the Auditor General. Consequently, the study does not involve human subjects, primary surveys, or interviews. Nevertheless, in accordance with institutional requirements, formal ethical clearance was sought and granted by the University of Zambia Directorate of Research and Graduate Studies prior to the commencement of the study. The approval for the study was given under: IORG No. 0005376, HSSREC IRB No. 00006464, REF NO. HSSREC-2024-JAN-074

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Cointegration and Stability

The Bounds Test yielded an F-statistic of 16.35, significantly exceeding the upper critical bound of 3.67 at the 5% significance level (Pesaran, et al., 2001). This confirms the existence of a stable long-run relationship among the variables. Further, diagnostic tests confirmed the robustness of the model:
Serial Correlation (Breusch-Godfrey): $\chi 2 = 2.62$, (p=0.26)
Heteroskedasticity (White): $\chi 2 = 15.04$, (p=0.13)
Normality (Jarque-Bera): $JB = 1.98$, (p=0.37)
Stability (CUSUM): Parameters remained within 5% critical bounds.

4.1.2 Long-Run Coefficients

The estimated long-run coefficients are presented in the table below:

Table 4
Estimated Long-Run Coefficients

Variable	Coefficient	P-Value
Log(Tax Revenue)	-0.99	0.01
Log(Non-Tax Revenue)	+0.40	0.07
Control of Corruption	+0.46	0.003
Law & Order	+2.26	0.02

This is transposed into the long-run equation as follows:
Equation 3 - Long-run equation of the model

$$\ln(GDPPCapCur) = 0.40 \cdot \ln(NonTaxRev) - 0.99 \cdot \ln(TaxRev) + 0.46 \cdot ICRGCorrpt + 2.26 \cdot ICRGLawOrder + \varepsilon_t \ldots (3)$$

From the long-run coefficients, a 1% increase in tax revenue is associated with a 0.99% decrease in GDP per capita. The statistically significant negative elasticity of -0.99 reveals a critical tax paradox within the Zambian economy. Contrary to standard Keynesian expectations where tax revenue funds growth-enhancing public goods, this result suggests that the aggregate distortionary burden of the current tax administration, characterized by high compliance costs and systemic refund delays, outweighs the fiscal multiplier effect. This finding aligns with the "distortionary taxation" hypothesis in EGT (Ugwunta & Ugwuanyi, 2015), indicating that the extraction mechanism acts as a drag on private sector liquidity and capital formation.

Regarding non-tax, 1% increase in non-tax revenue is associated with a 0.40% increase in GDP per capita, this is significant at 10 percent level. This would is an interesting result as conventionally, it would have been swallowed in the combined result of “revenue”. The significance of a contribution to GDP per capita growth while tax revenue has negative effect has implications for policy recommendation in DRM. The result suggests that expanding the fiscal base through non-tax instruments, such as mineral royalties and user fees, offers a less distortionary pathway to revenue mobilization than tax increases. This is true as it does not impose direct marginal disincentives on productive labour or enterprise business activities. It is a better measure for increases as it does not distort workers or business activities. Policies that align with this would result in better measures.

It is also observed that improvements in corruption control positively impact growth. This is because the highly significant positive coefficient of +0.46 provides robust empirical validation for NIE. It confirms that institutional integrity is not merely a normative ideal but a measurable economic input. This is better that taking it intuitively. The result show that reductions in rent-seeking behaviour lower transaction costs and improve the efficiency of resource allocation. Controlling corruption has positive effect on the economy. The result implies that a one-unit improvement in corruption control indices yields a substantial dividend in economic performance by fostering investor confidence which leads to better and improved investment.

Finally, stronger rule of law has a substantial positive impact on growth. Rule of law has the highest magnitude in the model, the coefficient of +2.26 underscores the primacy of the legal framework as the binding constraint on Zambia's development. This result suggests that the certainty provided by contract enforcement and property rights protection is a more potent driver of long-run growth than fiscal policy variables alone. It confirms that the "rules of the game" or simply put as institutions (North, 1990 ; Acemoglu, et al., 2005) function as a meta-production factor, exponentially amplifying the effectiveness of other economic inputs (Ricks & Doner, 2021 ; Uddin, et al., 2023 ; Nikiema & Zore, 2025).

4.1.3 Short-Run Dynamics

Table 5

Error Correction Term (ECT)

Term	Coefficient	P-value
Error Correction Term (ECT)	-0.71	0.01

Error Correction Term (ECT) table

A statistically significant and negative ECT confirms that a stable long-run relationship exists in the model. If the term were positive or insignificant, it would imply that the variables diverge indefinitely, rendering the system unstable. The Error Correction Term (ECT) of -0.71 ($p < 0.01$), indicates a rapid speed of adjustment of approximately 71%. It, therefore, implies that the system possesses a powerful self-correcting mechanism of 71% of any short-run shock to GDP per capita. Such a shock is corrected within a single year. This high speed of adjustment indicates that the Zambian economy responds rapidly to changes in institutional quality and DRM, therefore, quickly reverts to its long-term growth path.

4.1.4 Review of Variables in the study from the Results

The empirical findings from the ARDL model provide a robust statistical foundation for answering our study's core objective of ascertaining the impact of DRM institutions on Zambia's economic growth and to identify the primary factors contributing to institutional inefficiency and policy failures.

Dependent Variable

From the results above, the model successfully isolates the distinct impacts of DRM streams and institutional quality metrics on Zambia's economic trajectory. The results of the model indicate that GDP per capita in Zambia is highly responsive to policy equilibrium. The Error Correction Term (ECT) of -0.71 ($p = 0.01$) in short term dynamics reveals that if GDP per capita deviates from its long-run equilibrium due to a short-term economic shock, it self-corrects rapidly, recovering 71% of the deviation within a single year. This confirms that the variable is structurally anchored by the independent variables in the model.

Independent Variable – Tax Revenue

This is the most critical and counter-intuitive finding of the study; we termed this the “Tax Paradox.” Standard economic theory assumes tax revenue positively funds public goods. However, this highly significant negative elasticity indicates that for every 1% increase in tax revenue, GDP per capita contracts by 0.99%. This proves that the current Zambian tax system is fundamentally distortionary. The administrative inefficiencies, such as the chronic VAT refund delays which decapitalize businesses, and high compliance burdens that inflict a heavier cost on the business sector than it provides the economic benefit which is generated by government spending. This signals a serious need for administrative changes and a path to modernization that include digitization, rather than tax rate hikes.

Independent Variable – Non-Tax Revenue

This is significant at the 10% level. Non-tax demonstrates a positive relationship with economic growth. This result shows that disaggregating total DRM into tax and non-tax was crucial for the study, as bundling them would have obscured this positive impact of non-tax revenue. This implies that more should be done to develop non-tax collection systems. It would improve revenue collection through digitization.

Independent Variables: Institutional Quality Components

Control of Corruption variable strongly validates the New Institutional Economics (NIE) framework. The highly significant positive coefficient proves that institutional integrity in the country is not just a moral imperative, but a direct economic input and a valuable one. By controlling corruption in Zambia, there is effective lowering of “transaction costs” of doing business. Therefore, by reducing rent-seeking behaviour, it stops revenue leakages as it has been highlighted by Auditor General Reports. It also ensures that mobilized resources are actually allocated to productive economic sectors, which in turn boosts GDP per capita growth.

With regard to law and order, it proves that contract enforcement, property rights, and policy stability in the country, by avoiding erratic mining tax changes highlighted, act as a “meta-production factor.” In other words, without Law & Order, fiscal policies are ineffective. This is because investors require certainty; when the rule of law is strong, the risk premium drops, and capital formation accelerates exponentially leading to greater benefits of the country.

4.2 Discussion

The quantitative results highlight a critical paradox: while institutional quality and non-tax revenue support growth, tax revenue exhibits a negative long-run relationship. The Tax Paradox: The negative coefficient for tax revenue ($\beta = -0.99$) contradicts the standard assumption that tax revenue simply funds growth and provides funds for the government. In line with Endogenous Growth Theory, this suggests that the distortionary costs of the current tax system, likely driven by administrative inefficiencies and high compliance burdens, outweigh the benefits of the public expenditure it funds (Barro, 1990 ; Kufanga, 2024). This finding aligns with Unceta (2021), who noted the instability of Zambia's tax regime in financing government expenditure. It is a paradox as tax revenue is known to fund most economies. This is supported by findings that indicate that tax revenue is positively related to GDP at 5% level and promotes Economic Growth in Africa (Babatunde, et al., 2017). It is therefore critical that the identified bottle necks in the tax system are addresses in order to ensure that tax revenue provides the much-needed revenue for financing government operations and activities in Zambia. The refund delays work against endogenous resource mobilization by reducing compliance and formalization. The delays also promote corruption in order for people to be refunded quicker (Lungu & Mungule, 2023).

Institutional Primacy: Conversely, the strong positive coefficients for Law & Order (+2.26) and Control of Corruption (+0.46) validate North (1990) institutional hypothesis, which was later exemplified by Acemoglu et. al., (2005). For Zambia, the legal framework and governance integrity are more potent drivers of economic performance than fiscal inputs alone. This resonates with the findings by Majekodunmi (2023) and Bah (2024) regarding the primacy of institutions in African contexts.

Non-Tax Potential: The positive impact of non-tax revenue (+0.40) suggests that diversifying revenue streams through efficient collection of fines, user fees and royalties, offers a less distortionary path to fiscal sustainability. Policy Recommendations**:** Based on the quantitative evidence, the following policy interventions are recommended: Prioritize Institutional Reform**:** Given the high elasticity of Law & Order (+2.26), investments in judicial independence, contract enforcement, and anti-corruption mechanisms should be viewed as core economic growth strategies, not just governance reforms. There is need to heed the call by the auditor general to collect revenue efficiently (Office of the Auditor General, 2023 ; 2022). Digitizing the revenue collection and refund system would cut-out corruption. Moreover, it would bring about certainty as the refund would be predictable and traceable online.

Reform Tax Administration: The negative impact of tax revenue implies that there's a need to reduce compliance costs and administrative inefficiencies rather than increasing tax rates. Conversely, it means that digitization and automation of tax systems can reduce distortions and improve the "quality" of revenue collection and the cost of compliance will reduce. It is therefore important that the administration is reformed to ensure it reduces bottlenecks and improve compliance. Further, there should be a deliberate policy and accompanying revenue authority staff to formalize informal and artisanal businesses. The focus of tax administration should be on bringing the untaxed into the tax net. The administration should therefore have more officers on the ground and interacting with tax payers than middle and top management. It should be bottom heavy due to Zambia's large concentration of informal business activities. In any case, formalized businesses are reachable and traceable. While informal businesses cannot be traced. These need a dedicated team in each province to ensure they bring such tax payers on the system.

Diversify Revenue Sources: The positive impact of non-tax revenue supports a strategy of broadening the fiscal base through non-tax instruments. Such as modernized mineral royalty collection and formalized land fees, as suggested by Yoo (2011). Even though the recommendation was made a long time ago, it is important to work on land rates as they are a very stable source of revenue for the government. There should be a deliberate program to move land from customary to state in order to provide services and enable land owners to pay for the land. Large pieces of land including in Lusaka in surrounding districts are in chiefs' control with the government not receiving rates over the land. It is important that deliberate program target formalization of these pieces of land.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study provides robust quantitative evidence that institutional quality is a binding constraint on economic growth in Zambia for both tax and non-tax. Even though non-tax shows a great promise, the amount of revenue from non-tax is far lower than from tax revenue. It if from this that we state that while domestic resource mobilization is essential, its effectiveness is conditional on the quality of governance institutions. Future growth strategies must prioritize institutional strengthening to ensure that fiscal policy facilitates rather than hinders economic development. This would make DRM contribute to financing programs and overall.

5.2 Recommendations

The quantitative data above shows that Zambia needs a new way of handling fiscal policy, putting fundamental institutional reforms ahead of traditional rate changes. Law & Order's very high elasticity (+2.26) means that judicial independence, contract enforcement, and anti-corruption measures should be seen as the most important ways to boost economic growth. To get rid of discretion and improve fiscal certainty, revenue collection and tax refund systems should be digitised right away. At the same time, the tax system needs to be completely overhauled to lower compliance costs and avoid distortions. To do this, workers need to focus on formalising the informal sector by going out into the field instead of just managing more people. This will grow the tax base without raising tax rates. To further reduce the risk of revenues, it is important to diversify into non-tax income sources, such as modernising the collection of mining royalties and systematically converting customary land to state land. This will open up reliable, scalable fiscal streams from assets that are now not being used.

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REFERENCES

Acemoglu, D., & Robinson, J. A. (2013). *Why nations fail: The origins of power, prosperity, and poverty*. Crown Currency.

Acemoglu, D., Johnson, S., & Robinson, A. J. (2005). Institutions as a fundamental cause of long-run growth. In *Handbook of economic growth 1*, 385-472.

Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *American economic review, 91*(5), 1369-1401.

Aghion, P., & Howitt, P. (1997). *Endogenous Growth Theory.* The MIT Press.

Alimi, R. S. (2014). ARDL bounds testing approach to Cointegration: A re-examination of augmented fisher hypothesis in an open economy. *Asian Journal of Economic Modelling, 2*(2), 103-114.

Ayana, I. D., Demissie, W. M., & Sore, A. G. (2023). Effect of government revenue on economic growth of sub-Saharan Africa: Does institutional quality matter?. *Plos one, 18*(11), e0293847.

Babatunde, O. A., Ibukun, A. O., & Oyeyemi, O. G. (2017). Taxation revenue and economic growth in Africa. *Journal of accounting and taxation, 9*(2), 11-22.

Bah, M. (2024). Tax revenue mobilization and institutional quality in sub-Saharan Africa: An empirical investigation. *African Development Review, 36*(2), 201-221.

Barro, R. J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy, 98*(5), 103-125.

Besley, T., & Persson, T. (2014). Why do developing countries tax so little?. *Journal of economic perspectives, 28*(4), 99-120.

Beyaert, A., García-Solanes, J., & Lopez-Gomez, L. (2023). Corruption, quality of institutions and growth. *Applied economic analysis, 31*(91), 55-72.

Bird, R. M., Martinez-Vazquez, J., & Torgler, B. (2008). Tax effort in developing countries and high income countries: The impact of corruption, voice and accountability. *Economic analysis and policy, 38*(1), 55-71.

Chipimo, F. (2014). Financial Markets and Resource Mobilization in Zambia. *Zambia: Building Prosperity from Resource Wealth*, 129.

Choi, Y. B. (2012). *Institutional economics and national competitiveness*. Y. B. Choi (Ed.). Routledge.

Diamond, J. M. (1999). *Guns, germs, and steel: The fates of human societies*. W. W. Norton & Company

Ekori, A. H., & Masumbe, P. S. (2022). Financing Africa's post COVID-19 sustainable development: Domestic versus international resources mobilization. *Economit Journal: Scientific Journal of Accountancy, Management and Finance, 2.2*, 82-93.

Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, 251-276.

Hickey, S., & Sen, K. (2024). *Pathways to development: From politics to power.* New York: Oxford University Press.

Hussein, M. A., & Hmood, M. Y. (2024). Nonstationary Time Series Models Using ARDL and NARDL Estimation. *Journal of Economics and Administrative Sciences, 30*(141), 439-456.

International Monetary Fund. (2023). *Zambia: Technical Assistance Report-Diagnostic Report on Governance and Corruption.* International Monetary Fund, Lega Department. International Monetary Fund. doi:https://doi.org/10.5089/9798400228476.002

Kufanga, L. (2024). *Assessing the impact of value added tax (VAT) on government revenue in Zambia* (Doctoral dissertation, The University of Zambia).

Levine, E. J., & Tantardini, M. (2023). Defining and measuring economic development: A literature review and outlook. *Journal of Public and Nonprofit Affairs, 9*(3), 405-436.

Li, Z., Chu, Y., & Gao, T. (2020). Economic growth with endogenous economic institutions. *Macroeconomic Dynamics, 24*(4), 920-934.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of monetary economics, 22*(1), 3-42.

Lungu, A. B., & Mungule, C. M. (2023). An Analysis of the Value Added Tax (Vat) Gap in Zambia. *International Journal of Research and Innovation in Social Science, 7*(4), 752-762.

Majekodunmi, W. O. (2023). Quality of institutions as a determinant of foreign direct investment inflow and economic growth: Recent empirical evidence from Nigeria. *African Journal of Business and Economic Development, 3*(6), 1–22.

Mehlum, H., Moene, K., & Torvik, R. (2006). Cursed by resources or institutions?. *World Economy, 29*(8), 1117-1131.

Mukelabai, R., & Haabazoka, L. (2024). A Study of the Effect of Monetary Policy and International Reserves on Zambia's Economic Growth. *Applied Economics*, *2*(2), 63-75.

Nikiema, R., & Zore, M. (2025). Tax revenue instability in Sub-Saharan Africa: Does institutional quality matter?. *American Journal of Economics and Sociology*, *84*(1), 153-177.

North, D. C. (1990). Institutions, institutional change and economic performance. *Cambridge university press*.

North, D. C. (1994). Economic performance through time. *The American economic review*, *84*(3), 359-368.

Office of the Auditor General. (2022). *Auditor General's Main Report for the Financial Year Ended 31st December 2021.* Lusaka: Government of the Republic of Zambia.

Office of the Auditor General. (2023). *Auditor General's Main Report for the Financial Year Ended 31st December 2022.* Lusaka: Government of the Republic of Zambia.

Olayungbo , O. D., & Adediran, K. A. (2017). Effects of oil revenue and institutional quality on economic growth with an ARDL approach. *Energy and Policy Research, 4*(1), 44-54.

Oyinlola, M. A., Adedeji, A. A., Bolarinwa, M. O., & Olabisi, N. (2020). Governance, domestic resource mobilization, and inclusive growth in sub-Saharan Africa. *Economic Analysis and Policy, 65*, 68-88.

Pesaran, H. M., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics, 16*(3), 289-326.

Parsons, B., & Rabhi, A. (2025). Wages to woes: examining the relationship between real wage and conflict in Africa. *Conflict, Security & Development*, *25*(3), 341-363.

Readhead, A. (2016). Transfer pricing in the mining sector in Zambia. *Natural Resource Governance Institute*, 1-28.

Ricks, J. I., & Doner, R. F. (2021). Getting institutions right: Matching institutional capacities to developmental tasks. *World Development, 139*, 105334.

Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: the primacy of institutions over geography and integration in economic development. *Journal of economic growth*, *9*(2), 131-165.

Romer, P. M. (1994). The origins of endogenous growth. *Journal of Economic perspectives*, *8*(1), 3-22.

Seck, D. (2020). *Financing Africa's Development.* Springer International Publishing.

Sen, A. (1999). *Development as freedom* . (A. B. J. Timmons Roberts, Ed.) Oxford: Oxford University Press.

Stoian, A., & Iorgulescu, F. (2020). Fiscal policy and stock market efficiency: An ARDL bounds testing approach. *Economic Modelling, 90*, 406-416.

Tagem, A. M. E., & Morrissey, O. (2023). Institutions and tax capacity in sub-Saharan Africa. *Journal of Institutional Economics*, *19*(3), 332-347.

Uddin, I., Ahmad, M., Ismailov, D., Balbaa, M. E., Akhmedov, A., Khasanov, S., & Haq, M. U. (2023). Enhancing institutional quality to boost economic development in developing nations: New insights from CS-ARDL approach. *Research in Globalization, 7*, 100137.

Uddin, M. A., Ali, M. H., & Masih, M. (2021). Institutions, human capital and economic growth in developing countries. *Studies in Economics and Finance*, *38*(2), 361-383.

Ugwunta, O. D., & Ugwuanyi, U. B. (2015). Effect of distortionary and non-distortionary taxes on economic growth: Evidence from Sub-Saharan African countries. *Journal of Accounting and Taxation*, *7*(6), 106-112.

Unceta, R. A. (2021). The economic and social impact of mining-resources exploitation in Zambia. *Resources Policy, 74*, 102242.

World Bank. (2024). *Zambia public finance review: Enhancing domestic revenue mobilization and improving public expenditure efficiency. Washington, D.C.: World Bank Group.* Retrieved December 15, 2024, from https://www.worldbank.org/en/news/press-release/2024/09/23/new-world-bank-report-emphasizes-the-urgent-need-for-afe-zambia-to-boost-revenue-mobilization

World Bank. (2025). *Zambia's Road to Growth and Better Jobs*. Retrieved February 10, 2025, from https://www.worldbank.org/en/news/feature/2025/01/16/zambias-afe-road-to-growth-and-better-jobs

Yoo, D. (2011). *Institutions and Economic Growth* (Doctoral dissertation, The Ohio State University).

Zulu, J. J. (2016). *Institutions and Economic Growth: The Case of Zambia* (Doctoral dissertation, University of the Witwatersrand, South Africa.