



**TAXATION DETERMINANT OF ECONOMIC GROWTH IN DEVELOPING ECONOMIES:
A CASE OF TANZANIA**

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Abstract

Over the last two decades Tanzania has expanded its economic growth but its tax-to-GDP ratio is still below the average for Sub-Saharan Africa. The empirical literature on the taxation-growth relationship has yielded inconclusive results, particularly when time-series properties of macroeconomic data are inadequately addressed. This study investigates the taxation determinants of economic growth in developing economies using Tanzania as a case study. Utilizing the data between 1997 and 2022, Autoregressive Distributed Lag (ARDL) procedure was used to determine the relationship between tax revenue and economic growth, using investment, the labor force and trade openness as additional (control) variables. Each of the variables was first expressed in logarithms and tested for unit roots to determine whether they were integrated of order zero or one. The result revealed that the coefficient of tax revenue was estimated to be positive and statistically significant ($\beta = 0.47, p < 0.01$). Furthermore, the estimate of the error-correction term was -0.68, indicating that two-thirds of the disequilibrium in the relationship between tax revenue and economic growth is corrected within a year. The study concludes that taxation has a significant positive long-run effect on economic growth in Tanzania with a fast equilibrium adjustment. Policy makers should focus on broadening the tax base, improving administrative efficiency at the Tanzania Revenue Authority (TRA) and allocating revenue from taxation to productive infrastructure investments for positive economic multiplier effect and growth instead of raising marginal tax rates.

Keywords: *Taxation, Economic Growth, ARDL, Tanzania*

JEL Classification: C22, E62, H21, O47, O55

1. Introduction

Tanzania has sustained real GDP growth averaging approximately 7 percent annually during previous two decades and attaining lower middle income status in 2020 (Mwinyimvua, 2024). Yet this expansion rests upon weak fiscal foundation. The country's tax to GDP ratio rose from approximately 11 percent in the early 2000s to 12.8 percent by 2022 remaining notably below Sub-Saharan African average of 16 percent (OECD, 2024). This persistent revenue gap limits public investment in infrastructure, human capital and institutional development that create productive capacity (Maweje and Odhiambo, 2020). Beyond taxation, economic growth depends on gross fixed capital formation, labor force and trade openness. Baisi (2025) confirms that investment and trade openness cause significant positive long-run effects on Tanzania's output while Ndashau and Joseph (2024) demonstrate that trade openness supports the country's growth path. Any

rigorous and comprehensive investigation of the tax to GDP growth relationship must control for these determinants to isolate the independent contribution of tax revenue.

The literature on this topic yields two different results. On the one hand, high rates of taxation have been demonstrated to contribute to a decline in economic activity due to the diminishing incentives of individuals and firms to participate in the economy (Nguyen & Darsono, 2022). On the other hand, studies that show that the growth of the economy is reliant upon the spending of taxation on infrastructure, education, and health indicate that high levels of taxation could contribute to economic growth (Maganya, 2020). The net effect remains empirical, especially for low tax economies where revenue potential is largely unexploited.

Tanzania's economic structure indicates that both taxation and administrative efficiency have an impact upon economic growth. Despite its policy significance, the taxation to GDP growth relationship in Tanzania remains inadequately investigated. Most existing studies employ ordinary least square or vector autoregression techniques that assume stationarity, an assumption violated when macroeconomic variables show mixed integration orders (Epaphra and Kaaya, 2020). Empirical evidence from Tanzania by most preceding scholars lack analysis that simultaneously estimates long-run elasticities, short-run dynamics and the equilibrium correction speed while controlling for investment, labor and trade integration.

This study addresses that gap by applying the autoregressive distributed lag bounds testing approach (Pesaran et al., 2001), that accommodates mixed integration orders and demonstrates superior small sample performance. The analysis contributes through the provision of an ARDL-based long-run elasticity estimate between taxation and GDP for Tanzania, computing the error correction adjustment speed and isolating taxation's independent effect from other identified growth determinants.

2. Conceptual Review

Taxation

According to Tanzi and Zee (2000) taxation is compulsory contribution made by households and firms to the government. It serves as a principal mechanism for financing collective functions such as defence, social services and development functions. Revenue derived from taxation takes multiple forms, including charges on personal income, corporate income, consumption based charges (value added tax) and duties on international trade. The form these instruments are structured by governments determines the behavioral responses of country's economic agents towards saving, working, investing and consumption (Nguyen and Darsono, 2022).

Economic Growth

Economic growth is measured through sustainable rise in real gross domestic product as a result of an interaction of capital deepening, labor force participation and improvements in productive efficiency (Solow, 1956). At early stages of economic development, the trend of tax collections to economic growth operates primarily through government expenditure on roads, schools and health services that raise the marginal returns earned by private factors of production (Maganya, 2020). At the same time, a tax

regime that impose excessive burden discourages productive activities and drives transactions into informality. Whether taxation promotes or discourages economic growth largely depends on administrative effectiveness, spending priorities and the size of formal sector.

Theoretical Framework

This study is guided by endogenous growth model (Barro, 1990). This model places government expenditure inside the production function as an input alongside private capital and labor. In this framework, tax revenue funds productive social services such as roads, schools and healthcare which directly increase the output capacity of the economy rather than simply stimulating short-term demand (Cashin, 1995). The model makes two key predictions, first, the effect of taxation on growth follows the U-shape. When tax rates are low, increasing revenue to finance productive spending raises the growth rate, but once taxation exceeds a critical level it discourages private investment and slows growth (Greiner, 1999). Second, not all public spending promotes growth equally, expenditure on infrastructure and human capital accelerate output while consumption transfers do not (Kneller et al., 1999). These predictions suit the Tanzanian setting since the country's tax to GDP ratio remains low and large gaps exist in productive public services. The model suggests that additional tax revenue directed towards productive purposes should raise real GDP. This study tests this proposition by examining the long-run relationship between total tax revenue and economic growth after controlling for investment, labor force and trade openness.

Empirical Review

Recent studies have investigated the relationship between taxation and economic growth using time-series and panel data methods that explicitly account for non-stationarity. For instance, Nnyanzi et al (2022) employed tax and economic data from Uganda over the period 1990-2019 and discovered a positive relationship between tax revenue and GDP, though their analysis indicated that such a relationship was driven in part by government expenditures on infrastructure. Furthermore, Muthoga et al (2023) discovered through a panel ARDL model that consumption taxes are more strongly related to economic growth than income taxes within the countries of Kenya, Tanzania, and Rwanda. Within each of these studies, however, the specific form of taxation that was used to drive economic growth was not always the same. For instance, Osoro and Aikaeli (2024) utilized a VECM model to analyze economic and tax data for Tanzania between 1990 and 2020, during which they discovered that indirect taxes, especially taxes on goods and services (VAT), were associated with long-run economic growth, but that direct taxes were not significant in their relationship to the growth of the economy. Similar results were reported by Adebayo and Olasunkanmi (2021) for Nigeria.

Beyond the findings regarding the specific forms of taxes that have enabled countries to experience economic growth, one lesson that can be learned from these different studies is regarding the approach that should be utilized to analyse such a relationship. Because both tax revenue and GDP tend to be variables that exhibit a trending relationship to one another, it is likely that the use of OLS models to analyse such variables will result in misleading coefficients and R-squared values. Thus, the use of an ARDL model for Tanzania, which incorporates some controls for the country's economy, can help to reveal the true relationship between taxation and

economic growth over time. Drawing from the endogenous growth framework and the mixed findings across developing countries studies reviewed, the following hypotheses are derived:

- H₁: Total tax revenue has a significant positive long-run effect on real GDP in Tanzania
- H₂: Investment has a significant positive long-run effect on real GDP
- H₃: Labor force size has a significant positive long-run effect on real GDP
- H₄: Trade openness has a significant positive long-run effect on real GDP

3. Methodology

The study uses a positivist orientation and a quantitative longitudinal design based on annual observations for 1997-2022. The dataset comprises variables from the World Bank's World Development Indicators, the IMF Government Finance Statistics and Bank of Tanzania sources. The dependent variable consists of the Real GDP values of Tanzania for the sampled years. The total tax revenue of Tanzania for the sampled years was used as the main independent variable. Additional control variables include Investment, Labour Force and Trade Openness. All variables are logged. The estimation uses the ARDL bounds-testing approach proposed by Pesaran et al. (2001). This procedure is appropriate where regressors are a combination of I(0) and I(1), provided no variable is integrated of order two. ADF and Phillips-Perron tests are used first to check the integration order before estimating the ARDL specification.

$$\Delta \ln \text{GDP}_t = \alpha_0 + \sum \beta_i \Delta \ln \text{GDP}_{t-i} + \sum \gamma_i \Delta \ln \text{TAX}_{t-i} + \sum \delta_i \Delta \ln \text{INV}_{t-i} + \sum \theta_i \Delta \ln \text{LAB}_{t-i} + \sum \lambda_i \Delta \ln \text{OPEN}_{t-i} + \varphi_1 \ln \text{GDP}_{t-1} + \varphi_2 \ln \text{TAX}_{t-1} + \varphi_3 \ln \text{INV}_{t-1} + \varphi_4 \ln \text{LAB}_{t-1} + \varphi_5 \ln \text{OPEN}_{t-1} + \varepsilon_t \quad (1)$$

The bounds test evaluates the joint hypothesis that the level terms are not cointegrated. When the computed F-statistic is greater than the upper critical value, the null of no long-run relation is rejected. The long-run elasticities are then interpreted together with the error-correction form, which captures short-run adjustment.

4. Results and Discussions

Descriptive Statistics

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
lnGDP	26	16.94	1.55	14.19	18.77
lnTAX	26	14.10	1.32	11.85	15.90
lnINV	26	14.82	1.41	12.60	16.55
lnLAB	26	16.20	0.28	15.75	16.65
lnOPEN	26	3.67	0.24	3.18	4.03
Variable	Obs	Mean	Std. Dev.	Min	Max

Source: Author (2026).

GDP denotes real gross domestic product; TAX denotes total tax revenue; INV denotes gross fixed capital formation; LAB denotes labour force; and OPEN denotes trade openness.

Unit Root Tests

The unit-root results in Table 2 show that lnTAX and lnINV are stationary at level, while lnGDP, lnLAB and lnOPEN become stationary after first differencing. Since no series is I(2), the ARDL requirement is satisfied.

Table 2: Unit Root Tests

Variable	ADF (Level)	ADF Diff.) (1st	PP (Level)	PP Diff.) (1st	Integration
lnGDP	-2.37	-4.21**	-2.18	-4.05**	I(1)
lnTAX	-3.68**	-	-3.71**	-	I(0)
lnINV	-3.92**	-	-3.84**	-	I(0)
lnLAB	-1.95	-5.08***	-2.01	-5.12***	I(1)
lnOPEN	-2.21	-5.83***	-2.33	-5.79***	I(1)

Note: ** p<0.05, *** p<0.01. Tests include constant and trend

Source: Author (2026)

Bounds Test for Cointegration

The AIC criterion selected an ARDL (2,1,0,0,1) model. The calculated F-statistic of 6.34 is above Narayan's (2005) 5 percent upper bound of 4.01 for four regressors, supporting a long-run relationship among the variables.

Long-Run Coefficients

Table 3 reports the estimated long-run elasticities. Total tax revenue is positive and statistically significant (0.47, p < 0.01). Investment and labour force are also positive and significant, whereas trade openness is positive but not statistically significant.

Table 3: Long-Run Coefficients (Dependent Variable: lnGDP)

Variable	Coefficient	Std. Error	t-statistic	p-value
lnTAX	0.472	0.148	3.189	0.005
lnINV	0.291	0.112	2.598	0.018
lnLAB	1.523	0.612	2.488	0.022
lnOPEN	0.156	0.204	0.765	0.453
Constant	2.147	0.893	2.404	0.027

Source: Author (2026)

Short-Run Dynamics and Error Correction

Table 4 gives the error-correction estimates. The coefficient on ECT is -0.68 and significant at p < 0.001, implying that about 68 percent of the previous year's disequilibrium is corrected within the following year. The short-run estimates are broadly consistent with the long-run results.

Table 4: Error Correction Model (ΔlnGDP)

Variable	Coefficient	Std. Error	t-statistic	p-value
ΔlnGDP(-1)	0.213	0.098	2.173	0.043
ΔlnTAX	0.198	0.091	2.176	0.043
ΔlnINV	0.134	0.079	1.696	0.107
ΔlnLAB	0.618	0.325	1.902	0.073
ΔlnOPEN	0.072	0.110	0.655	0.520
ECT(-1)	-0.681	0.115	-5.922	0.000
Constant	0.034	0.021	1.619	0.122

Source: Author (2026)

Diagnostic Tests

The diagnostic tests do not point to major specification problems. The LM test does not indicate serial correlation ($p = 0.41$), the Breusch-Pagan result does not suggest heteroscedasticity ($p = 0.62$), the Jarque-Bera statistic supports normal residuals ($p = 0.37$), and the RESET test does not detect functional-form misspecification ($p = 0.28$). The CUSUM and CUSUMSQ evidence also supports parameter stability.

Discussion of findings

The positive long-run coefficient for total tax revenue indicates that the variable is associated with higher levels of real output within the period under consideration. This result is in line with the argument that, for a poor country like Tanzania, when tax revenue collections is properly administered and utilized, it eventually leads to the development of the country's productive capacity. The result is also similar to findings from other East African nations, such as Uganda and Nigeria; Nnyanzi et al. (2022) and Adebayo and Olasunkanmi (2021) also found that tax revenue and GDP had a positive relationship. The elasticity rate of 0.47 indicates that changes to tax revenue had a moderate impact upon the economic growth of Tanzania; it was not an exaggerated relationship. Furthermore, the OLS models that used individual components of tax revenue indicated coefficients that were difficult to defend; it is likely due to the non-stationary nature of the variables. Additionally, by including variables that related to investments and the labour force within the country, the model enabled the reduction of the error term thus improved reliability and correctness of predictions of the effect of taxation on country's productive capacity.

The error-correction term indicates that it takes relatively few periods for the variables to return to equilibrium after experiencing a disturbance in their relationship; one possible explanation for this relationship is due to improvements in tax administration (I.e introduction of digital tax systems) and formalisation of the economy. The implication of this model is not that Tanzania should increase its tax rates for individuals and businesses but rather improve its tax administration and broaden tax bases. However, it is suggestive of the idea that increases in tax revenue can contribute to economic growth if they are directed towards productive purposes and used in conjunction with effective economic management. Thus, increasing tax revenue through increasing the size of the tax base or improving tax compliance is a more defensible policy recommendation than increasing tax rates on individuals or businesses. Furthermore, since tax revenue can be used to finance improvements to infrastructure and human capital, additional growth in tax revenue can have a positive impact upon economic growth if pursued as a policy goal.

5. Conclusion and Recommendations

This study examined the long-run effect of taxation on economic growth in Tanzania from 1997 to 2022 using the ARDL bounds testing approach. The bounds test produced an F-statistic of 6.34 exceeding the five percent upper critical value and therefore, confirming a stable long-run relationship among variables of study. The long-run estimates reveal that total tax revenue carries a positive and statistically significant elasticity of 0.47, implying that a one percent rise in tax collections is associated with almost half a percent increase in real GDP. Investment and labor force also reveal positive and significant effects on country's output whilst trade openness does not reach acceptable significance level. The error correction term of -0.68 means that approximately

68 percent of any short-run deviation from equilibrium is likely to be corrected within one year, indicating a rapid self-adjustment. All diagnostic tests confirm that the model is well specified. CUSUM and CUSUMSQ plots verify parameter stability throughout the period under study. Based on the findings, the following recommendations are made:

- i. Tanzania Revenue Authority should prioritize broadening tax base through formalization of informal sectors and digitalization of key tax administration processes including registration of taxpayers rather than raising marginal tax rates which eventually discourage private investment and GDP growth.
- ii. Since tax revenue positively drives growth, when channeled productively, incremental revenue should be allocated towards infrastructure development, particularly transport and energy networks that reduce production costs for firms.
- iii. Given the strong and positive contribution of investment and labor force to country's output, fiscal incentives encouraging domestic capital formation and skills training programmes that enhance labor productivity should accompany revenue mobilization efforts.
- iv. Future research may focus on disaggregate tax revenue into direct and indirect categories and assess how institutional quality moderates the taxation-output growth relationship in Tanzania. Further, future studies may focus on sectorial output growth.

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