Advanced Research in Economics and Business Strategy Journal

E-ISSN : 2773-3807
P-ISSN : 2716-9421

Vol.06 No.01 (2025)

164-180

Exploring the Relationship between Foreign Direct Investment, External Debt Stock, and Economic Growth in Tanzania

Seth Kenedi Mbwambo[1], Romanus L. Dimoso[2]

Received: 14/05/2025 Accepted : 14/06/2025 Published : 30/06/2025

https://doi.org/10.52919/arebus.v6i01.77

ABSTRACT

This study investigates the relationship between external debt stock, foreign direct investment (FDI), and economic growth in Tanzania to assess their dynamic effects and causal linkages from 1970 to 2023. The motivation stems from the critical role that external capital flows play in supporting Tanzania's economic development, particularly in rising debt levels and efforts to attract foreign direct investment. Using annual time series data, the study employs the Autoregressive Distributed Lag (ARDL) model to capture short-run and long-run dynamics, following stationarity confirmation through the Augmented Dickey-Fuller (ADF) test. The Bounds test results indicate no evidence of a long-run equilibrium relationship among the variables. However, the Granger causality analysis reveals that foreign direct investment (FDI) significantly influences economic growth and external debt, while no causal relationship between external debt and GDP has been detected. The findings suggest that external debt has a significant short-term positive impact on economic growth, while FDI consistently exerts a positive and significant effect. These results highlight the importance of promoting productive foreign investment and ensuring effective utilization of external borrowing to support sustainable economic growth. Policymakers are encouraged to prioritize FDI-driven sectors and maintain prudent debt management practices to enhance Tanzania's growth prospects.

Keywords: External Debt Stock, Economic growth, Foreign Direct Investment, Granger Causality, ARDL, Tanzania

JEL codes: F21, F34, O11.

How to cite this article

Mbwambo, S. K., & Dimoso, R. L. (2025). Exploring the Relationship between Foreign Direct Investment, External Debt Stock, and Economic Growth in Tanzania. Advanced Research in Economics and Business Strategy Journal, 6(1), 164-180. https://doi.org/10.52919/arebus.v6i01.77

[1] Corresponding Author: (MSc.Economics), Moshi Co-operative University, Moshi, Tanzania, email: mbwamboseth14@gmail.com:

[2] (PhD Economics), Senior Lecturer at Mzumbe University, Economics Department, Mzumbe, Morogoro, Tanzania. email: rdimoso@mzumbe.ac.tz

1. INTRODUCTION

The relationship between external debt stock, foreign direct investment, and economic growth remains critical, especially for developing economies aiming for sustainable development. Understanding this nexus is vital for policymakers in crafting strategies that effectively utilize external financial resources while minimizing potential risks. Globally, external debt and FDI play a pivotal role in shaping economic trajectories(Utouh et al., 2024). External debt helps nations close financing gaps, facilitating potential investment in infrastructure, healthcare, and education. However, excessive debt can lead to fiscal imbalances and economic instability (Okutimiren, 2024). The World Bank (2024) has warned that proposed U.S. tariffs on global imports could reduce global economic growth by 0.3 percentage points in 2025, highlighting the interconnectedness of global economies and the potential impact of policy decisions on debt dynamics (Amoh et al., 2024). Similarly, FDI provides a channel for capital, technology transfer, and managerial expertise, contributing to economic growth. Nevertheless, the benefits of FDI are often unevenly distributed, with wealthier nations reaping more advantages. In 2023, developed countries received over $1.4 trillion in loan repayments from developing nations, and this figure is projected to exceed $2 trillion annually by 2030, underscoring persistent economic disparities (Taylor & Lokina, 2024).

In Sub-Saharan Africa (SSA), external debt and FDI play a significant role in economic development. Empirical studies indicate that external debt and its volatility negatively impact economic growth in the region (Tile et al., 2024). Despite this, external debt in SSA increased from $213.33 billion in 2000 to $313.17 billion in 2011, reflecting a growing reliance on external borrowing (Agyapong & Bedjabeng, 2020). Additionally, FDI inflows to Africa have been inconsistent and influenced by political stability, regulatory frameworks, and global economic conditions. The World Bank (2024) projects a modest growth rate of 3% for Sub-Saharan Africa in 2023, up from 2.4% in 2024, with slow investment growth cited as a hindrance.

In the case of Tanzania, the country has experienced notable economic growth, with projections indicating an average growth rate of around 6% over the medium-term Bank of Tanzania (BOT, 2022). As of the first quarter of 2024, Tanzania's external debt has notably increased. The total debt held by the central government rose to 44.3% of GDP, up from 42.5% in the previous fiscal year, amounting to approximately $34.5 billion in nominal terms. This represents a significant rise of 12.3% compared to the previous fiscal year (BOT, 2022). The growth in external debt was recorded at an increase of 8.2%, indicating that while there is an upward trend in borrowing from foreign sources, it remains manageable within the context of Tanzania’s overall economic framework. The public debt-to-GDP ratio is projected to remain comfortably below Tanzania’s debt-carrying capacity benchmark of 55% (WB, 2024). This suggests that while external borrowing is increasing, it is being managed prudently and does not pose an immediate risk to economic stability. The government is balancing its need for external financing with maintaining a sustainable level of debt relative to its economic output. The Foreign Direct Investment (FDI) has had a positive recovery trend following a prolonged decline in previous years. As estimated for early 2024, net FDI inflows are around 2% of GDP, reflecting renewed investor confidence and interest in Tanzania's market potential (BOT, 2022). This recovery can be attributed to several factors, including ongoing structural reforms aimed

at improving the business environment, which have made Tanzania more attractive to foreign investors. This growth is partly attributed to increased external borrowing and FDI inflows. Tanzania's external debt grew by 8.2%, while domestic debt surged by 20.3%, reflecting a significant rise in borrowing to finance development projects (WB, 2024).

Research on the effects of external debt and FDI on Tanzania's economic growth presents mixed findings. A study by Semvua and Mkenda (2024) found that foreign direct investment is insignificant in influencing economic growth. On the contrary, Utouh et al. (2024) found that FDI has a minimal effect on economic growth, while Jilenga et al. (2016) found a negative effect of FDI on economic growth. Differently, Bilame (2022); and Mwakabungu & Kauangal (2023) found that foreign direct investment has a considerable impact on economic growth. On the other hand, the effect of external debt on economic growth in Tanzania showed mixed and controversial results (Tile et al., 2024; Taylor & Lokina, 2024; Chindengwike & Kira, 2021).

Despite existing studies, research gaps remain in understanding the nuanced relationships between external debt, FDI, and economic growth in Tanzania. Previous research often focuses on bivariate relationships, neglecting the potential interactions between external debt and FDI and their combined effect on economic growth. This study aims to fill these gaps by employing a comprehensive analytical framework that simultaneously examines the roles of external debt and FDI in influencing Tanzania's economic growth. By incorporating recent data and utilizing advanced econometric techniques, the research seeks to provide nuanced insights that can inform policy decisions. Understanding these relationships is crucial for formulating policies that optimize the external financial inflows while ensuring sustainable economic growth.

The study specifically seeks to i) explore the relationship between foreign direct investment, external debt stock, and economic growth in Tanzania and ii) explore if there exists a long-run relationship between the external debt stock, foreign direct investment, and the economic growth in Tanzania iii) examine the possible causal link among external debt stock, foreign direct investment and economic growth in Tanzania.

Research hypothesis

H_o: No significant effect of external debt stock or foreign direct investment on economic growth in Tanzania

H_o: No long-run association between external debt stock, foreign direct investment, and economic growth in Tanzania

H_0: No causality between external debt stock, foreign direct investment, and economic growth in Tanzania

2. LITERATURE REVIEW

2.1.Theoretical Underpinning

The Neo-Classical Growth Theory was developed in the 1950s by Robert Solow and Trevor Swan as an extension and refinement of earlier growth models, such as the Harrod-Domar Model (Zahra et al., 2021). Their key argument was that long-term economic growth is driven by three main factors: capital accumulation, labor force growth, and technological progress, with technological progress being the primary determinant of sustained growth. Unlike the Harrod-Domar model, which suggested that economies could experience instability due to fixed capital-output ratios, the Solow-Swan Model introduced the concept of diminishing

returns to capital, implying that while capital accumulation can drive growth in the short run, it cannot sustain long-term growth unless accompanied by technological advancement (Mankiw et al., 1990). This innovation laid the foundation for modern growth analysis and has remained one of the most influential economic theories in explaining growth patterns across different economies.

The Neo-Classical Growth Theory is particularly relevant to studying the relationship between external debt stock (EDS), foreign direct investment (FDI), and economic growth (GDP) in Tanzania because of its emphasis on capital accumulation and technology as drivers of growth. Moreover, when EDS is effectively utilized, it can help finance infrastructure, industrialization, and human capital development, all of which contribute to increased productivity (Mwakabungu & Kauangal, 2023). Similarly, FDI serves as a channel for capital injection, knowledge transfer, and technological innovation, which aligns with the theory's emphasis on technology as the key determinant of sustained (Utouh et al., 2024). Another strength of the theory is its convergence hypothesis, which suggests that low-income countries like Tanzania can grow faster than developed nations if they absorb technology and allocate resources efficiently. While the theory assumes that technology is exogenous and does not account for institutional and policy-related factors, its core principles remain valuable in explaining how external financial inflows influence Tanzania's economic trajectory through capital accumulation and productivity improvements. Therefore, despite its limitations, the Neo-Classical Growth Theory offers a structured basis for assessing the role of external debt and FDI in economic progress, making it a valuable tool for this study.

2.2.**Empirical Review**

Empirical studies have extensively examined the relationship between foreign direct investment (FDI), external debt, and economic growth, providing a range of findings. Research focusing on Tanzania, such as Bilame (2022) and Mwakabungu & Kauangal (2023), confirm a significant positive impact of FDI on economic growth, with Mwakabungu & Kauanga identifying unidirectional causality from FDI to GDP using ARDL and Granger causality tests. Similarly, Utouh et al. (2024) found that GDP growth in Tanzania is primarily driven by its past values. FDI minimally impacts GDP, revealing no bidirectional causality between the two variables.

Broader regional studies, such as Asafo-Agyei & Kodongo (2022), highlight a nonlinear relationship, showing that FDI only significantly enhances growth when inflows exceed a specific threshold and absorptive capacity is adequate. On a global scale, Sahu (2021) and Ciobanu (2020) confirm that FDI positively impacts economic growth, emphasizing its role in trade openness, technological advancement, and labor force expansion. These findings collectively suggest that while FDI plays a critical role in fostering economic growth, its effectiveness is influenced by country-specific conditions such as institutional readiness and the strategic allocation of investments.

Conversely, the relationship between external debt and economic growth is more nuanced (Amoh et al., 2024). The study analyzed 29 Sub-Saharan African countries and found that positive debt shocks enhance growth, while negative shocks significantly hinder it, particularly in the short run. Similarly, Tile et al. (2024) examined East African nations, concluding that external debt negatively impacted GDP in Tanzania, Kenya, and Burundi, while Uganda experienced an insignificant positive effect.

Ale et al. (2023) studied South Asian countries and revealed a significant negative relationship between external debt and economic growth in the short and long run. Studies such as Elkhalfi et al. (2024) and Mohsin et al. (2021) present a nonlinear relationship where initial debt accumulation stimulates growth, but excessive levels lead to diminishing returns. In the Tanzanian context, Chindengwike and Kira (2021) and Taylor and Lokina (2024) highlighted the significant impact of foreign debt on economic growth and the need for prudent debt management strategies. Despite these findings, Osuma and Nzimande (2024) and Çetin (2022) argued that external debt negatively affects long-term development prospects in Sub-Saharan Africa, underscoring the challenges of leveraging debt for sustainable growth.

While these studies provide valuable insights, there remains a significant gap in the literature regarding the integrated analysis of external debt stock and FDI on economic growth in Tanzania. Existing studies focus on external debt or FDI individually without exploring their combined influence. Additionally, nuanced findings, such as those by Taylor & Lokina (2024), Agyapong & Bedjabeng (2020), which link FDI to financial development, and Nguéda & Kelly(2022), which associates FDI with economic complexity, suggest that these variables may interact in more complex channels to influence growth. This gap underscores the need for empirical research examining the interplay between external debt, FDI, and economic expansion. It provides a more comprehensive understanding of their joint effects on Tanzania's economic performance.

2.3.Conceptual Framework

Figure 1 conceptual framework incorporates the endogenous growth theory, which emphasizes that economic growth is driven by internal factors such as investment in human capital, innovation, and knowledge. In this context, the framework shows the relationships between External Debt Stock (EDS), Foreign Direct Investment (FDI), and Economic Growth (GDP). According to the endogenous theory, FDI can enhance economic growth by bringing in capital, technology, and knowledge, stimulating innovation and productivity. However, high external debt (EDS) levels may hinder growth by creating financial constraints and reducing government spending.

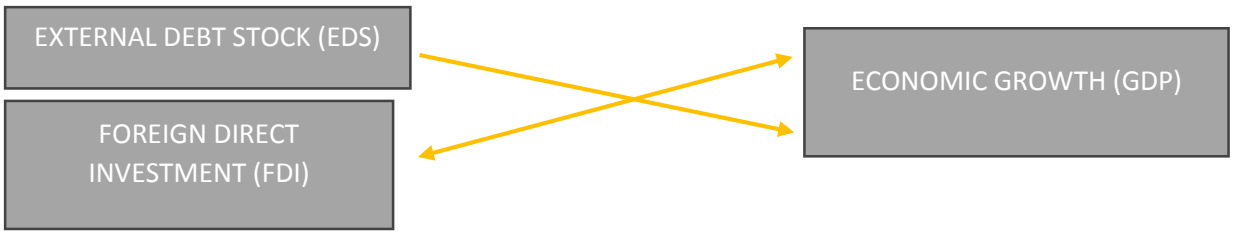

Figure 1: Conceptual Framework
Source: Author's construction (2025)

3. METHODOLOGY

3.1.Research Design

This study adopted the statistical research designs employing the annual time series data for 54 years spanning 1970 to 2023. The statistical designs help track changes and identify trends, cycles, and structural breaks. Moreover, statistical study designs ensure that time-series

econometric methods such as ARDL and VECM are useful for predicting future economic performance based on historical data.

3.2.Data Source

The study's reliance on secondary data from the World Bank (WB) emphasizes the importance of accuracy and reliability in managing and extracting information for analysis. The choice of these databases reflects a commitment to dependable sources that undergo rigorous quality checks and verification processes, ensuring high standards of transparency and credibility in research (Mbwambo, 2024).

3.3.Variable Measurement

All study variables were obtained from the World Bank, where Economic growth (GDP) was measured using GDP per capita (current US$) as a proxy for well-being, sourced from the World Bank. External debt stock (EDS), measured by total outstanding debt (current US$), has an ambiguous effect on growth, positive if it funds productive investments but negative if it causes debt overhang or instability. Additionally, Foreign direct investment (FDI), measured by net inflows (current US$), has mixed impacts. That is, FDI can boost growth through capital, technology, and job creation but may harm it via profit repatriation, displacement of domestic industries, or dependency.

Table 1. Description and Measurement of the Variables

Variable	Measurement	Source	Expected sign
Economic growth (GDP)	GDP per capita (Current US$)	WB	NA
External debt stock (EDS)	Total (DOD, current US$)	WB	+/-
Foreign direct investment (FDI)	Net inflows (BOP, current US $)	WB	+/-

3.4.Econometric Model

The study on the nexus between the external debt stock, foreign direct investment, and economic growth in Tanzania employed the Autoregressive Distributed Lag (ARDL), which was adopted from studies by Mbwambo (2024); Pesaran et al. (2001); Millia et al., (2020) with some improvements to suit this study. The model selection is grounded on the facts that are superior in explaining the short-run and long-run associations among variables. Nevertheless, it is the ability to estimate the stationary and nonstationary variables when they are I(0) or I(1) (Mbwambo, 2024).

$$GDP_t = EDS_t^{\gamma} FDI_t^{\delta} \quad \ldots\ldots 1$$

Where GDP = GDP per capita, EDS= External debt stock, FDI= Foreign direct investment, and γ *and* δ are the elasticity of EDS and FDI on GDP, respectively.

To ensure robustness and linearity, variables were then transformed into the natural logarithms as per Equation 2

$$lnGDP_t = \alpha + \gamma lnEDS_t + \delta lnFDI_t + \varepsilon_t \quad \ldots\ldots 2$$

Where α is constant, and ε_t is the error terms include all other variables that affect economic growth but are not explicitly explained by the model

Test for stationarity

A necessary step when estimating the ARDL model is to ensure that variables are either integrated of order zero I(0) or integrated of order one I(1) and neither of order two I(2). In this context, Augmented Dickey-Fuller (ADF) was tested as equation 3

H0: $\gamma = 0$ the series has a unit root (not stationary)

$\Delta X_t = \alpha + \beta_t + \gamma X_{t-1} + \sum_{i=1}^{p} \delta_i \Delta X_{t-i} + \varepsilon_t$ ……..3

Where α is the drift term, β_t is the trend component, Δ is the difference operator, and ε_t is the white noise error term.

Lag selection Criteria

After stationarity has been verified then, finding an optimal lag duration for the ARDL model using lag selection criteria, such as Akaike Information Criterion-(AIC), Schwarz Bayesian Criteria-(SBC), and Hannan-Quinn Criterion-(HQC) from the vector autoregression equation 4

$Y_t = \alpha + \sum_{i=1}^{p} \beta_i Y_{t-1} + \varepsilon_t$ ……..4

Where p optimal lag length is chosen based on the lowest AIC, BIC, or HQC values

Bound test for cointegration

According to Pesaran et al. (2001), in cointegration, equation 5 was then approximated since variables may have a propensity to exhibit long-term correlations among themselves.

H0: $\lambda_1 = \lambda_2 = \lambda_3 = 0$ (No cointegration) against H1: $\lambda_1 = \lambda_2 = \lambda_3 \neq 0$ (There is cointegration)

The threshold: F-statistic is greater than the upper bound critical value, reject H0, and conclude there is cointegration.

$\Delta GDP_t = \lambda_0 + \sum_{i=1}^{p} \lambda_1 \Delta lnGDP_{t-1} + \sum_{i=0}^{q} \lambda_2 \Delta lnEDS_{t-1} + \sum_{i=0}^{q} \lambda_3 \Delta lnFDI_{t-1} + \theta ECM_{t-1} + \varepsilon_t$ ……..5

ARDL short-run estimation as per equation 6

$lnGDP_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 lnGDP_{t-1} + \sum_{i=0}^{q} \alpha_2 lnEDS_{t-i} + \sum_{i=0}^{q} \alpha_3 lnFDI_{t-i} + \varepsilon_t$ ……..6

Where α_0 is the constant, α_i for i=1, 2, and 3 are the short-run coefficients, and ε_t is the error term

ARDL long run estimates and Error correction term (ECM)

When variables are cointegrated, the long-run dynamic is estimated, and the ECM, which shows the speed of adjustment after shocks toward long-run equilibrium, is then estimated as equation 7

$\Delta lnGDP_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \Delta lnGDP_{t-1} + \sum_{i=0}^{q} \beta_2 \Delta lnEDS_{t-i} + \sum_{i=0}^{q} \beta_3 \Delta lnFDI_{t-i} + \theta ECM_{t-1} + \varepsilon_t$ ……..7

Granger Causality test

The Granger causality test examines whether one time series can predict another. If past values of one variable help forecast another variable (Mbwambo, 2024). From the vector autoregressive, equation 8 was estimated to check if EDS and FDI granger cause the GDP

H0: EDS and FDI do not Granger-cause GDP ($\alpha_2 = \alpha_3 = 0$)

$lnGDP_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 lnGDP_{t-i} + \sum_{i=1}^{q} \alpha_2 lnEDS_{t-i} + \sum_{i=1}^{q} \alpha_3 \Delta lnFDI_{t-i} + \varepsilon_t$ ……..8

Rule of thumb: If the p-value < 0.05**,** reject H0, meaning the independent variable Granger causes the dependent variable.

4. RESULTS

4.1.Descriptive Statistics

Table 2 shows the descriptive statistics of the data. The GDP shows low variability (Std. Dev = 0.52) and a narrow, symmetric range (5.38 to 7.11), supporting normality. Additionally, lnEDS exhibits moderate variability (Std. Dev = 0.89) with a larger range (19.10 to 24.27), indicating potential positive skewness but still a reasonable spread for approximate normality. Furthermore, lnFDI, with moderate variability (Std. Dev = 2.22), which is within± 3 the threshold and a wide range (14.23 to 21.46), can also be considered normally distributed, assuming its spread is symmetrical around the mean (18.68). All variables lnGDP, lnEDS, and lnFDI follow a normal distribution.

Table 2.The Descriptive Statistics

Variable	Observation	Mean	St.dev	Minimum	Maximum
LnGDP	54	6.215462	0.5245781	5.380983	7.11028
LnEDS	54	22.65021	0.8922925	19.10054	24.26706
lnFDI	54	18.68009	2.217289	14.23422	21.45912

4.2.Trends of the Variables

Trend of Economic growth (GDP per capita)

The trend of economic growth proxied by GDP per capita shows steady growth in the 1970s, followed by a sharp decline in the 1980s, likely due to global economic shocks, poor policies, or debt crises. The 1990s reflect stagnation, with limited reforms and weak growth. Recovery began in the 2000s, with consistent increases in GDP per capita driven by economic liberalization, diversification, and foreign investments. The 2010s and 2020s exhibit rapid growth, reflecting improved governance, infrastructure, and resilience in key sectors. Overall, the long-term upward trend indicates significant economic progress despite earlier volatility.

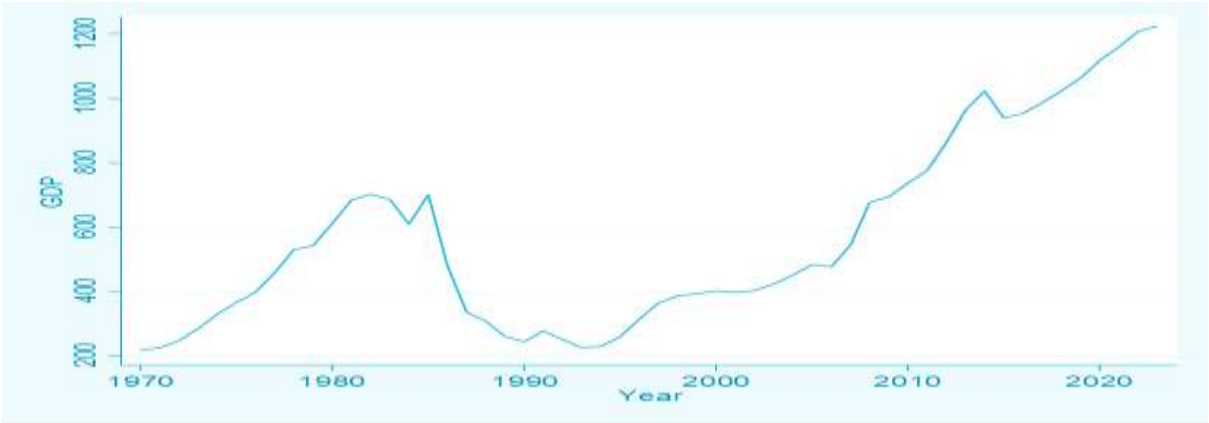

Figure 2: The GDP per capita trends from 1970 to 2023

Source: World Bank (2024)

The trend of External Debt Stock (EDS)

Figure 3 illustrates the trend in external debt stock (EDS) from 1970 to 2022. In the early years, the EDS increased steadily, reflecting initial borrowing to support economic development. The 1980s and 1990s show periods of gradual growth with some fluctuations, possibly due to rescheduling, structural adjustment programs, or debt relief initiatives. From

the early 2000s, EDS began to rise sharply, with a significant acceleration after 2010, likely driven by increased external borrowing to finance large-scale infrastructure projects and development programs.

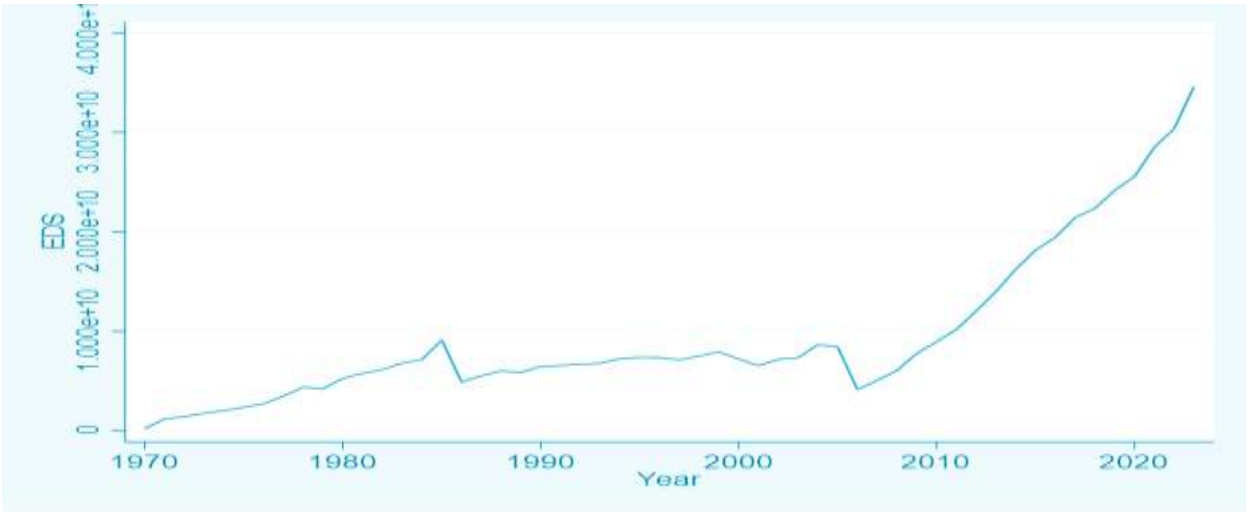

Figure 3: Trend of External Debt Stock from 1970 to 2023
Source. World Bank (2024)

Trend of Foreign Direct Investment (FDI)

In Figure 4, Foreign Direct Investment (FDI) shows minimal trends from 1970 to the late 1980s, reflecting limited international investments. A gradual increase begins in the 1990s, driven by economic liberalization and reforms to attract foreign investors. The early 2000s mark a sharp rise in FDI, indicating increased investor confidence and opportunities in key sectors like natural resources and infrastructure. After 2010, FDI became more volatile, with periods of strong growth followed by slowdowns, likely due to global economic conditions or domestic policy changes. Despite the fluctuations, the long-term trend reflects significant growth in FDI over time.

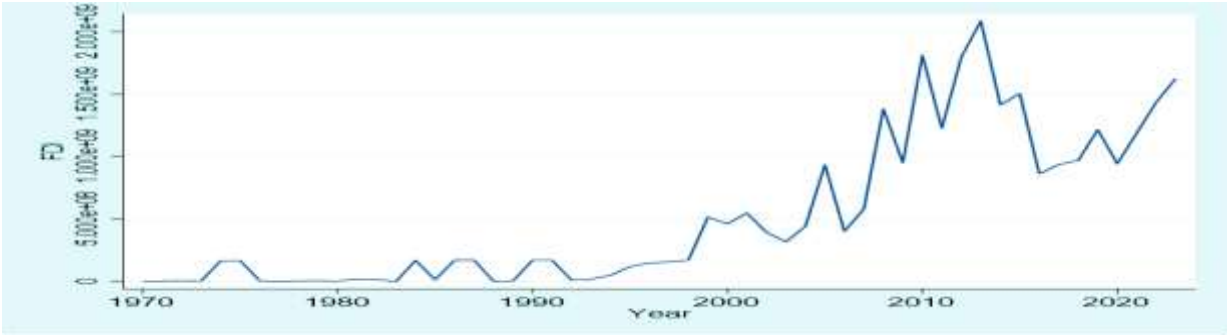

Figure 4. Trends of Foreign Direct Investment from 1970 to 2023
Source: World Bank (2024)

Test for Unit Root

The table shows stationarity test results for GDP, EDS, and FDI, highlighting their test statistics, critical values, p-values, and orders of integration. GDP and FDI are (1), meaning they are stationary after the first difference, as their test statistic (-4.309 and -9.567) are below all critical values, and their p-values ($p< 0.001$ and $p<0.001$) confirm non-stationarity at levels. EDS is *I*(0), stationary at levels, with a test statistic of -4.738($p<0.001$), failing to accept the

presence of a unit root. This indicates that GDP and FDI exhibit trends, while EDS is stable without differencing. This confirms the use of ARDL since the variables are I(0) and I(1) only.

Table 3. Augmented Dickey-Fuller Test Results

Variable	Test-Statistic	Critical Value (1%)	Critical Value (5%)	Critical Value (10%)	p-value	Order of integration
lnGDP	-4.309***	-3.577	-2.928	-2.599	0.0004	I(1)
lnEDS	-4.738***	-3.576	-2.928	-2.599	0.0001	I(0)
lnFDI	-9.567***	-3.577	-2.928	-2.599	0.0000	I(1)

*Notes: ***(P<0.01)*

Lag Order Selection

Lag selection in ARDL is essential to capture dynamic relationships, ensuring valid short-run and long-run inferences. It avoids underfitting or overfitting, accommodates mixed orders of integration *I*(0) and *I*(1), and improves forecasting accuracy (Mbwambo, 2024).

The optimal lag for lnGDP is 4, as indicated by the lowest Final Prediction Error (FPE = 0.011336) and the most negative AIC (-1.64257). The selection is supported by a significant likelihood ratio (LR = 4.5462) with p=0.033, showing that adding lag 4 improves the model as Table 4a

Table 4a. Lag Order Selection (lnGDP)

Lag	LL	LR	df	FPE	AIC	HQIC	SBIC
0	-35.7907			0.255063	1.47163	1.48619	1.50987
1	37.3833	146.35	1	0.014219	-1.41533	-1.38621	-1.33885
2	43.6281	12.49	1	0.011529	-1.62512	-1.58144*	-1.5104*
3	43.7913	0.3263	1	0.011924	-1.59165	-1.5334	-1.43869
4	46.0644	4.5462*	1	0.011336*	-1.64257*	-1.56976	-1.45137

*Notes: * The lag selected by the criteria*

The optimal lag for lnEDS is 1, determined by the lowest FPE (0.0308) and the most negative AIC (-0.643616), HQIC, and SBIC. The LR test (133.96, p=0.000 confirms that lag 1 provides the best fit for the model as per Table 4b

Table 4b. Lag Order Selection (lnEDS)

Lag	LL	LR	df	FPE	AIC	HQIC	SBIC
0	-48.8888			0.43071	1.99555	2.01011	2.03379
1	18.0904	133.96*	1	0.030763*	-0.643616*	-0.614491*	-0.567135*
2	18.1123	0.04379	1	0.031993	-0.604491	-0.560805	-0.48977
3	18.1129	0.00122	1	0.033305	-0.564516	-0.506267	-0.411554
4	18.2048	0.18382	1	0.034548	-0.528192	-0.455381	-0.33699

*Notes: * The lag selected by the criteria*

The optimal lag for lnFDI is 3, which minimizes the FPE (1.76529) and has the lowest AIC (3.40585). The LR test (7.7953, p=0.005) supports the inclusion of lag 3 for better model performance as per Table 4c

Table 4c. Lag Order Selection (lnFDI)

Lag	LL	LR	Df	FPE	AIC	HQIC	SBIC
0	-107.465			4.485	4.33861	4.35317	4.37685
1	-86.0246	42.881	1	1.98011	3.52099	3.55011	3.59747
2	-85.044	1.9614	1	1.98184	3.52176	3.56545	3.63648
3	-81.1463	7.7953*	1	1.76529*	3.40585*	3.4641*	3.55881*
4	-80.4804	1.3317	1	1.78963	3.41922	3.49203	3.61042

*Notes: * The lag selected by the criteria*

Cointegration Test

The ARDL bound test in Table 5 indicates the null hypothesis (H0: No levels relationship) is tested using an F-statistic of 2.906 and a t-statistic of -2.630. For the F-statistic, the value (2.906) lies below the critical bounds for I(0) and I(1) regressors at all levels, failing to reject H0. For the t-statistic, the value (-2.630) is smaller than the I(0) critical value (-2.57) at 10% level but greater than the I(1) critical value (-3.21), meaning the evidence is inconclusive. Overall, there is insufficient evidence to establish a level relationship between the variables.

Table 5. ARDL Bound Test

Critical Values for the F-statistic			
Significance Levels	10%	5%	1%
K	I(0), I(1)	I(0), I(1)	I(0), I(1)
k = 2	3.17, 4.14	3.79, 4.85	5.15, 6.36
Critical Values for T-statistic			
k = 2	-2.57, -3.21	-2.86, -3.53	-3.43, -4.10

Autoregressive Distributed Lag Model (ARDL) Estimation

Model Summary

With an R-squared of 0.9824 and an Adjusted R-squared of 0.9779, the model summary shows a strong fit and suggests that the model explains around 98% of the variation in the dependent variable. The total statistical significance of the model is demonstrated by the F-statistic (217.99, $p<0.01$). The average prediction error is minimal, as indicated by the Root Mean Square Error (RMSE) of 0.0743. The model matches the data well, as indicated by the high log-likelihood score (65.24). These measurements show that the model is sound and provides trustworthy information about how the variables relate to one another.

Table 6a. Model Summary

Statistic	Value
F (10, 39)	217.99
Prob > F	0.0000
R-squared	0.9824
Adj R-squared	0.9779
Log likelihood	65.239
Root MSE	0.0743

ARDL Short-run Estimates

Table 6b results highlight significant temporal dynamics in the relationships between GDP, external debt stock (lnEDS), and foreign direct investment (lnFDI). GDP shows strong effects, with significant positive results from the first lag (1.581**,** $p<0.01$) and smaller positive **(**0.571**,** $p<0.01$) and negative corrections in later lags. External debt stock (lnEDS) has a significant positive short-term effect (0.291**,** $p<0.01$), suggesting that debt can initially stimulate growth, but the first lag (−0.266, $p<0.01$) indicates adverse long-term effects. Furthermore, lnFDI shows no significant contemporaneous effect (−0.005, $p=0.623$), but its first lag (0.024**,** $p<0.05$) reveals a delayed positive impact, while the second lag (−0.033, $p<0.01$)) suggests diminishing returns. The third lag (0.022**,** $p<0.05$) rebounds positive effect, indicating that FDI's benefits depend on proper timing and absorption.

Table 6b. ARDL short run Estimates

lnGDP	Coefficient	St. Error	t	P>t	95% confidence level	
lnGDP						
L1.	1.581***	0.117	13.470	0.000	1.343	1.818
L2.	-0.923***	0.200	-4.610	0.000	-1.328	-0.518
L3.	0.571***	0.191	2.990	0.005	0.185	0.956
L4.	-0.325***	0.113	-2.880	0.006	-0.552	-0.097
lnEDS						
--.	0.291***	0.074	3.940	0.000	0.142	0.441
L1.	-0.266***	0.072	-3.710	0.001	-0.410	-0.121
lnFDI						
--.	-0.005	0.009	-0.490	0.623	-0.024	0.014
L1.	0.024**	0.010	2.490	0.017	0.005	0.044
L2.	-0.033***	0.010	-3.130	0.003	-0.054	-0.012
L3.	0.022**	0.010	2.110	0.042	0.001	0.043
cons	-0.149	0.514	-0.290	0.774	-1.189	0.892

****p<.01, **p<.05 *p<.1*

ARDL Post Estimation

In Table 7 Breusch-Godfrey LM test was performed to detect autocorrelation in the residuals. With (χ^2=2.002, p=0.9647)**,** the results fail to reject the null hypothesis (H0: No serial correlation) at any conventional significance level. Additionally, the white test shows chi-square (χ^2= 50.00, p=0.4334), and the results fail to reject H0 (Homoscedasticity) at any significance level. Finally, the Jarque Bera test for normality of residuals shows (χ^2 of 1.568, p=0.4566), the results fail to reject H0(normality) at a given significance level. Therefore, the model is free from heteroscedasticity, autocorrelation, and non-normality and ensures robust estimates.

Table 7. ARDL Post-Estimation Diagnostic Results

BG-LM test for autocorrelation:	Chi2 = 2.002, p-value = 0.9647
Heteroscedasticity (White test):	Chi2 = 50, p-value = 0.4334
Jarque Bera test for normality:	Chi2 = 1.568, p-value = 0.4566

Mode Stability Test

The CUSUM of squares shows that the model is stable within the bounds to any shocks and dynamics, and it performs well, as shown in Figure 5.

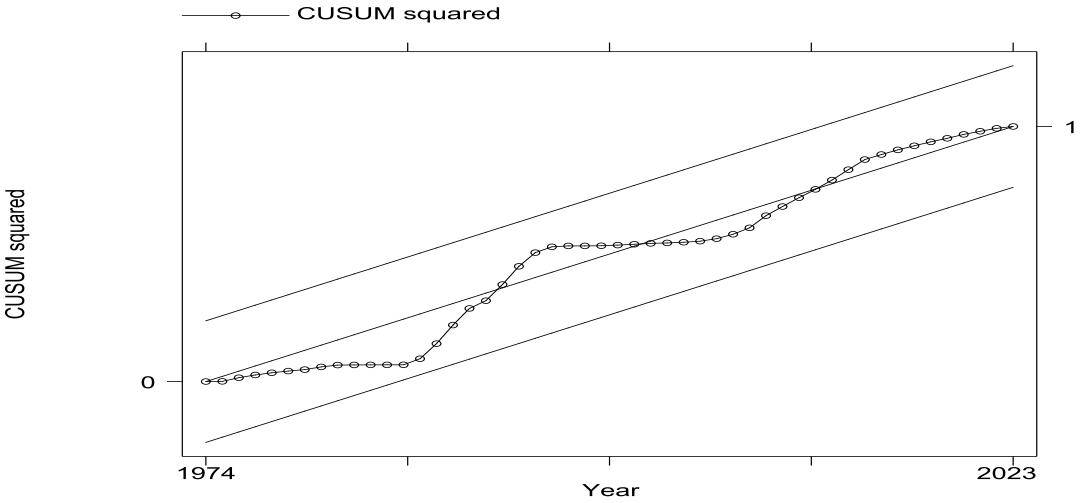

Figure 5. Test for model stability by CUSUM of Squares

Granger Causality Test

The Granger causality results reveal unidirectional relationships where lnFDI Granger causes lnGDP (p=0.0000) and lnEDS (p=0.032), indicating that foreign direct investment significantly predicts economic growth and external debt stock. However, there is no evidence of reverse causality from lnGDP or lnEDS to lnFDI, confirming strictly causality from lnFDI to the other variables. Additionally, no causality is observed between lnEDS and lnGDP, as neither variable Granger causes the other (p=0.295 and p=0.223, respectively). Overall, the findings highlight the pivotal role of FDI in influencing both economic growth and debt, while no bidirectional relationships are identified.

Table 8. Granger Causality Wald Results

Equation	Excluded	Chi²	df	Prob > Chi²
lnGDP	lnEDS	3.703	3	0.295
lnGDP	lnFDI	20.174	3	0.000
	ALL	21.318	6	0.002
lnEDS	lnGDP	4.387	3	0.223
lnEDS	lnFDI	8.780	3	0.032
	ALL	16.775	6	0.010

5. DISCUSSION

The findings align with and, in some cases, contrast with previous research on the relationship between external debt, foreign direct investment (FDI), and economic growth in Tanzania. The study reveals that external debt positively influences economic growth in the short run but is negatively influenced by its second lag, a pattern also observed in studies by Amoh et al. (2024), Tile et al. (2024), Mohsin et al., 2021). These findings support the debt-overhang hypothesis, which suggests that excessive borrowing can lead to fiscal distress and slower growth. Similarly, Elkhalfi et al. (2024) and Mohsin et al. (2021) found a nonlinear relationship where moderate debt accumulation initially stimulates growth but becomes detrimental when it exceeds a critical threshold. However, these results differ from those of Osuma & Nzimande (2024) and Ale et al. (2023), who argue that external debt generally hampers long-term development in Sub-Saharan Africa. Furthermore, this study finds no evidence of causality between external debt and GDP, contradicting studies such as

Chindengwike and Kira (2021), which identified a significant link between debt and economic growth.

Regarding FDI, the study finds that its effect on economic growth is not immediate but emerges with a lag, showing positive and diminishing returns over time. This is consistent with Utouh et al. (2024), who found FDI's impact on GDP to be minimal, and Jilenga et al. (2016), who reported a negative effect. However, it contrasts with Bilame (2022) and Mwakabungu and Kauangal (2023), who found that FDI significantly contributes to economic growth in Tanzania. The study also reveals a unidirectional causality between FDI, GDP, and external debt, indicating that FDI significantly impacts economic growth and external borrowing decisions. This supports the findings of Mwakabungu & Kauangal (2023), who also observed a unidirectional causality from FDI to GDP, but contrary to Jilenga et al. (2016)and Semvua & Mkenda (2024). However, the non-causality between EDS and GDP supports the findings of Duramany-Lakkoh et al. (2022), Okutimiren (2024), and Tile et al. (2024) differs from Taylor & Lokina (2024) and Çetin (2022), who reported bidirectional causality.

The absence of a long-run relationship between FDI, external debt stock, and economic growth in Tanzania can be attributed to several structural and institutional factors. First, much of the FDI inflows into Tanzania have historically been concentrated in extractive industries such as mining, the agriculture sector, and construction, which often have limited linkages with the broader economy and thus do not generate widespread, sustained economic benefits (UNCTAD, 2020; Utouh et al., 2024). Similarly, external debt may not have been consistently channeled into productive sectors capable of stimulating long-term growth, with some borrowings directed toward consumption or long-term public projects, which may have a delayed outcome. (Duramany-Lakkoh et al.,2022; Senadza et al.,2017; Agbloyor et al., 2016). Moreover, macroeconomic instability, including inflationary pressures and exchange rate volatility, eroded the positive effects of external resources. Institutional quality, governance challenges, and regulatory inefficiencies could also limit the ability of FDI and external debt to translate into stable economic growth (Agbloyor et al., 2016; Mbogella et al., 2024). Furthermore, Tanzania's structural economic vulnerabilities, such as a narrow industrial base and reliance on agriculture, make it difficult to harness external capital effectively over the long run, while exposure to external shocks like commodity price fluctuations further destabilizes growth pathways (Kumburu, 2022; Kironde, 2006).

6. CONCLUSION AND RECOMMENDATIONS

6.1.Conclusion

This study explores the relationship between external debt stock, foreign FDI, and economic expansion in Tanzania. It reveals that while external debt initially boosts economic growth, its long-term effects are negative, emphasizing the need for sustainable borrowing. FDI plays a significant role in economic expansion, though its benefits are delayed and subject to diminishing returns over time. The Granger causality test confirms that FDI influences economic growth and external debt, while no direct link exists between external debt stock and GDP. These findings highlight the importance of managing external debt stock prudently while fostering a conducive environment for FDI to maximize its positive impact on economic growth.

6.2.Recommendations

In light of these findings, several policy considerations emerge to strengthen the contribution of FDI and external debt to Tanzania's economic growth. Strategic efforts could focus on encouraging foreign investment into sectors with strong potential for value addition, technology transfer, and employment generation, such as manufacturing, agribusiness, and services. Ensuring external borrowing is aligned with investments in productive infrastructure, education, and healthcare can help maximize its developmental impact while maintaining debt sustainability. Strengthening macroeconomic stability through sound fiscal and monetary management would support a favorable investment environment. Enhancing institutional capacity, regulatory frameworks, and governance mechanisms may also be important in improving the effectiveness of both FDI and external debt. Additionally, pursuing economic diversification and human capital development strategies can contribute to building greater resilience against external shocks and fostering more inclusive and sustainable growth over the long term.

ACKNOWLEDGEMENT

I express my sincere gratitude to the late Dr. Romanus Dimoso for his invaluable contributions to this article, both as the corresponding author and as a dedicated scholar in the academic field. His guidance, insight, and commitment to academic excellence were instrumental throughout the development of this work. Dr. Dimoso passed away on 13th May 2025, and his legacy continues to inspire. May his soul rest in eternal peace.

DECLARATION

The authors declare no conflict of interest

REFERENCE

Agbloyor, E. K., Gyeke-Dako, A., Kuipo, R., & Abor, J. Y. (2016). Foreign direct investment and economic growth in SSA: The role of institutions. *Thunderbird International Business Review*, *58*(5), 479-497.

Agyapong, D., & Bedjabeng, K. A. (2020). External debt stock, foreign direct investment, and financial development: Evidence from African economies. *Journal of Asian Business and Economic Studies*, *27*(1), 81–98. https://doi.org/10.1108/JABES-11-2018-0087

Ale, S. A., Islam, M. S., & Tun-Nessa, H. (2023). Does External Debt Affect Economic Growth: Evidence from South Asian Countries. *International Journal of Economics and Financial Issues*, *13*(1), 83–88. https://doi.org/10.32479/ijefi.13527

Amoh, J. K., Abdul-Mumuni, A., & Amankwa Fosu, R. (2024). Revisiting the debt–growth nexus in sub-Saharan Africa: fresh evidence from panel nonlinear ARDL approach. *International Journal of Emerging Markets*. https://doi.org/10.1108/IJOEM-04-2023-0598

Asafo-Agyei, G., & Kodongo, O. (2022). Foreign direct investment and economic growth in Sub-Saharan Africa: A nonlinear analysis. *Economic Systems*, *46*(4). https://doi.org/10.1016/j.ecosys.2022.101003

Bilame, O. (2022). Foreign Direct Investment and Tanzania Economic Performance : A Time Series Over 1980-2020 Period. *The Sub-Saharan Journal of Social Sciences and Humanities (SJSSH)*, *May*, 1–8.

BOT (Bank of Tanzania). (2022). *Tanzania Investment Report 2022 : Foreign Private*

Investment.

Çetin, G. (2022). Analysis of the Relationship between External Debt Stock, Inflation and Economic Growth for Turkiye: Vector Autoregressive Models- Granger Causality Test and Toda-Yamamoto for the Period 1970-2020. *Namık Kemal Üniversitesi Sosyal Bilimler Meslek Yüksek Okulu Dergisi*, *4*(2), 53–62. https://doi.org/10.56493/nkusbmyo.1184476

Ciobanu, A. M. (2020). The Impact of FDI on Economic Growth in Case of Romania. *International Journal of Economics and Finance*, *12*(12), 81. https://doi.org/10.5539/ijef.v12n12p81

Daniel Chindengwike, J., & Kira, A. R. (2021). The Impact of Foreign Debts on Economic Growth in Tanzania: Evidence From 1988-2020. *International Journal of Creative Research Thoughts*, *9*(3), 25–35. www.ijcrt.org

Duramany-Lakkoh, E. K., Jalloh, H., & Abu, A.-M. (2022). A Granger Causality Test on the Impact of Public Debt on the Economic Growth of Sierra Leone. *Modern Economy*, *13*(07), 952–976. https://doi.org/10.4236/me.2022.137051

Elkhalfi, O., Chaabita, R., Benboubker, M., Ghoujdam, M., Zahraoui, K., Alaoui, H. El, Laalam, S., Belhaj, I., & Hammouch, H. (2024). The impact of external debt on economic growth: The case of emerging countries. *Research in Globalization*, *9*(August), 100248. https://doi.org/10.1016/j.resglo.2024.100248

Jilenga, M. T., Xu, H., & Gondje-Dacka, I.-M. (2016). The Impact of External Debt and Foreign Direct Investment on Economic Growth: Empirical Evidence from Tanzania. *International Journal of Financial Research*, *7*(2), 154–162. https://doi.org/10.5430/ijfr.v7n2p154

Kironde, J. L. (2006). The regulatory framework, unplanned development, and urban poverty: Findings from Dar es Salaam, Tanzania. *Land use policy*, *23*(4), 460-472.

Kumburu, N. P. (2022). Disaster Economic Vulnerability and Recovery Programs Experience from Tanzania. In *Disaster Risk Reduction for Resilience: Disaster Economic Vulnerability and Recovery Programs* (pp. 45-70). Cham: Springer International Publishing.

Mankiw, N. ., Romer, D., & Weil, D. (1990). A contribution of the Empirics of Economic Growth. In *Energy, Economic Growth, and the Environment* (3541). https://doi.org/10.4324/9781315064079-8

Mbogella, A. P., Kira, A. R., & Ngomuo, S. I. (2024). Challenges facing internal auditors in Tanzania: A case of local government authorities in Tanzania. *SN Business & Economics*, *4*(9), 99.

Mbwambo, S. (2024). Globalization, Urbanization, Energy Consumption, Economic Expansion, and Industrialization: Pathway to Tanzania's Environmental Sustainability Agenda 2030. *East African Journal of Environment and Natural Resources*, *7*(1), 358–373.

Millia, H., Adam, P., Saenong, Z., Balaka, M. Y., Pasrun, Y. P., Saidi, L. O., & Rumbia, W. A. (2020). The influence of crude oil prices volatility, the internet and exchange rate on the number of foreign tourist arrivals in Indonesia. *International Journal of Energy Economics and Policy*, *10*(6), 280–287. https://doi.org/10.32479/ijeep.10083

Mohsin, M., Ullah, H., Iqbal, N., Iqbal, W., & Taghizadeh-Hesary, F. (2021). How external debt led to economic growth in South Asia: A policy perspective analysis from quantile

regression. *Economic Analysis and Policy*, *72*(September), 423–437. https://doi.org/10.1016/j.eap.2021.09.012

Mwakabungu, B. H. P., & Kauangal, J. (2023). An empirical analysis of the relationship between FDI and economic growth in Tanzania. *Cogent Economics and Finance*, *11*(1). https://doi.org/10.1080/23322039.2023.2204606

Nguéda, R. D. N., & Kelly, A. M. (2022). The Nexus between Economic Complexity and Foreign Direct Investment in Sub-Saharan Africa. *South Asian Journal of Social Studies and Economics*, *14*(2), 41–52. https://doi.org/10.9734/sajsse/2022/v14i230377

Okutimiren, A. (2024). Evaluating Symmetric Causality between External Debt and Macroeconomic Variables in Nigeria. Economic Insights – Trends and Challenges, 2024(2),

Osuma, G., & Nzimande, N. P. (2024). Exploring the Dynamic Link Between Trade Openness, External Debt, and Economic Growth in Sub-Saharan Africa: Challenges and Considerations. *Economies*, *12*(11). https://doi.org/10.3390/economies12110283

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*(3), 289–326. https://doi.org/10.1002/jae.616

Sahu, J. P. (2021). Does inflow of foreign direct investment stimulate economic growth? Evidence from developing countries. *Transnational Corporations Review*, *13*(4), 376–393. https://doi.org/10.1080/19186444.2020.1833603

Semvua, R. ., & Mkenda, B. . (2024). The Role of Foreign Direct Investment on Economic Growth in Tanzania: Empirical Evidence from Emerging Sectors. *International Journal For Multidisciplinary Research*, *1*(1), 14–30. https://doi.org/10.36948/ijfmr.2023.v05i06.9305

Senadza, B., Fiagbe, K., & Quartey, P. (2017). The effect of external debt on economic growth in Sub-Saharan Africa. *International Journal of Business and Economic Sciences Applied Research (IJBESAR)*, *11*(1).

Taylor, R. S., & Lokina, R. (2024). The Relationship Between Public Debt and Economic Growth in Tanzania. *Review of Black Political Economy*. https://doi.org/10.1177/00346446241275134

Tile, A., Utouh, H. M. L., & Sesabo, J. K. (2024). External Debts as Panacea to Economic Growth Challenges in Selected Eastern African Countries: An Application of the Autoregressive Distributed Lag Model. *Science Mundi*, *4*(1), 25–35.

UNCTAD (2020)**:** Report on investment trends and FDI patterns.

Utouh, H., Mchukwa, E., & Tibuhinda, R. (2024). The Effects of Foreign Direct Investment on Economic Growth (Gross Domestic Product) in Tanzania. *Economic Insights – Trends and Challenges*, *2024*(2), 89–100.

World Bank. (2024). *Global outlook* (Issue January).

World Bank. (2024). *Tanzania Economic Update* (Issue 21).

Zahra, F., Tahir, A ., & Ali, H. (2021). Validation of Solow Swan Model in Pakistan: An Empirical Evidence. *Journal of Research & Reviews in Social Sciences Pakistan*, *4*(2), 1325–1335.