Effect Of External Debt On Foreign Direct Investment In The Eastern African Sub-Region Countries

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ABSTRACT : *This study investigates the effect of external debt on Foreign Direct Investment in Eastern African Sub-Region Countries from 1990 to 2023. Despite sustained external borrowing aimed at bridging fiscal gaps and promoting growth, domestic investment and foreign direct investment (FDI) have remained subdued in the region. Using secondary panel data from 18 Eastern African Sub-Region Countries, the study employs a longitudinal research design and applies advanced econometric techniques, including the* Pooled *Mean Group (PMG) estimator, Panel ARDL, cross-sectional dependence tests, and cointegration analysis. Trend analysis reveals that external debt has risen sharply, particularly in Ethiopia, Kenya, and Mozambique, while FDI and domestic credit remain relatively stagnant. Empirical results indicate a significant long-run positive relationship between external debt and investment, suggesting that productive borrowing can stimulate capital formation. Conversely, debt servicing exerts a negative effect on FDI, highlighting the crowding-out effect of high repayment obligations. Diagnostic tests confirm the robustness of the models, with no evidence of autocorrelation or heteroskedasticity, and residuals are normally distributed. The findings align with the Debt Overhang and Crowding-Out theories, demonstrating that while external debt can enhance investment when managed prudently, excessive debt servicing undermines investor confidence and fiscal capacity. The study contributes to the literature by providing a comprehensive regional analysis of the debt investment nexus in East Africa, offering insights for policymakers on debt sustainability, investment promotion, and financial sector development. It recommends prioritizing productive borrowing, strengthening domestic financial intermediation, and implementing debt management strategies to foster sustainable investment growth.*

Keywords: External Debt, Foreign Direct Investment, Eastern African Sub-Region Countries, Pooled Mean Group (PMG), ARDL, Debt Overhang, Investment Climate

Introduction

Globally, foreign direct investment (FDI) has long been viewed as a catalyst for economic growth, technology transfer, and job creation. Since the 1990s, liberalization and globalization expanded FDI flows to developing economies, with global inflows peaking at USD 2.3 trillion in 2007 before declining sharply during global financial and health crises (UNCTAD, 2023). At the same time, external debt stocks of developing nations surged from USD 1.4 trillion in 1990 to over USD 9.1 trillion in 2023 (World Bank, 2024). This debt escalation diverted fiscal resources toward debt servicing, limiting infrastructure investment critical for attracting FDI. By 2023, developing countries spent over USD 847 billion on interest payments alone, equivalent to more than their combined education and health budgets (UNCTAD, 2024). Thus, while external borrowing aimed to spur capital formation, excessive debt accumulation globally has eroded investor confidence and constrained sustainable investment flows.

Across Africa, FDI inflows have fluctuated due to commodity price cycles, policy volatility, and rising debt vulnerabilities. Between 1990 and 2023, Africa's external debt grew from USD 279 billion to over USD 1.13 trillion, while FDI inflows stagnated at around USD 53 billion in 2023, a 6% decline from 2022 (UNCTAD, 2024). The continent's average debt-to-GDP ratio rose from 30% in the 1990s to above 60% in 2023, crowding out fiscal resources for productive investment. Empirical evidence shows that countries with high debt service burdens such as Zambia, Ghana, and Mozambique experienced declining FDI due to elevated sovereign risk, weak credit ratings, and currency depreciation (IMF, 2023). This indicates that Africa's growing dependence on non-concessional external borrowing has curtailed the continent's ability to leverage debt for productive investment and sustainable growth.

In the 18 UN-classified Eastern African Sub-Region Countries, including Uganda, Kenya, Tanzania, Ethiopia, Rwanda, Burundi, Mozambique, Zambia, and others, external debt has grown from USD 37 billion in 1990 to over USD 186 billion in 2023 (World Bank, 2024). Yet, FDI inflows remain modest, averaging only USD 12–15 billion annually, representing less than 10% of Africa's total (UNCTAD, 2024). Rising external debt servicing absorbing nearly 40% of export revenues in countries like Kenya, Ethiopia, and Zambia, has deterred new foreign investors, weakened infrastructure funding, and heightened macroeconomic instability. Debt distress in nations such as Somalia, South Sudan, and Eritrea has further discouraged long-term FDI commitments. Consequently,

while external borrowing in East Africa was intended to bridge fiscal gaps and stimulate investment, persistent debt overhang has instead undermined investor confidence, limited domestic capital formation, and constrained the region's capacity to attract sustained foreign investment.

Problem Statement

Investment remains central to economic growth, job creation, and poverty reduction. However, the East African region continues to face persistent underinvestment despite policy reforms and regional integration efforts. Between 1990 and 2023, external debt in the 18 UN-classified Eastern African Sub-Region Countries rose from USD 37 billion to over USD 186 billion, while FDI inflows stagnated below USD 15 billion annually (World Bank, 2024; UNCTAD, 2024). High debt servicing absorbing up to 40% of export earnings in countries such as Kenya, Ethiopia, and Zambia has diverted fiscal resources from productive investment, increased sovereign risk, and discouraged foreign investors (IMF, 2023; MoFPED, 2023). Although external borrowing was intended to bridge financing gaps and stimulate growth through infrastructure investment, much of it has financed recurrent expenditures, resulting in a debt overhang that crowds out both domestic and foreign investment (Krugman, 1988; Were, 2018). The growing reliance on non-concessional loans and Eurobonds has further strained fiscal sustainability and heightened macroeconomic instability (Ndoricimpa, 2020; Fagbemi, 2020). Consequently, the region faces a paradox where external borrowing, instead of fostering productive capital formation, undermines it. Despite these concerns, empirical evidence on how external debt specifically affects investment, particularly FDI in Eastern African Sub-Region Countries remains limited. This study, therefore, investigates the effect of external debt on investments in Eastern African Sub-Region Countries from 1990 to 2023, providing insights to guide debt sustainability and investment policy reforms.

Empirical Evidence Literature

Empirical studies in North Africa reveal that rising external debt burdens have constrained investment growth, particularly in economies dependent on commodity exports. For instance, Elbadawi and Ndulu (2019) found that in Egypt and Morocco, increasing debt-service obligations diverted fiscal resources from productive investments, leading to a crowding-out effect on private capital formation. Similarly, Abdelrahman (2021) reported that Algeria's high public debt levels reduced investor confidence, lowering FDI inflows and domestic investment. These findings align with the Debt Overhang Theory, which suggests that high debt discourages investment due to fears of future taxation (Krugman, 1988).

In West Africa, evidence shows a mixed relationship between external debt and investment. Owusu-Nantwi and Erickson (2019) observed that in Ghana and Nigeria, rising external debt ratios negatively affected domestic investment, while concessional borrowing had a positive but short-term impact. Akomolafe and Danladi (2020) further reported that high debt-service ratios in Nigeria reduced fiscal capacity for capital projects, thus limiting FDI inflows. Similar conclusions by Adedokun (2018) emphasize that debt sustainability and sound macroeconomic management determine whether debt stimulates or suppresses investment.

In East Africa, research indicates that persistent external borrowing has contributed to declining domestic investment rates. Were (2018) found that Kenya's debt accumulation crowded out private sector lending, while Mugume and Ochieng (2022) noted that in Uganda and Tanzania, heavy debt servicing constrained fiscal space for development spending. These findings correspond with Iyoha's (1999) cross-country study, which showed that excessive debt burdens depress private investment in Sub-Saharan Africa, confirming the debt overhang and crowding-out effects in the region.

Theory for the study

The study was guided by the Keynesian Theory of Public Debt, developed by John Maynard Keynes (1936), which argues that government borrowing can be a vital tool for stimulating investment and growth during economic downturns. According to Keynes, public borrowing finances productive expenditure that enhances aggregate demand, employment, and capital formation (Keynes, 1936). In this context, the theory provides a foundation for analyzing whether external debt in Eastern African Sub-Region Countries has been used productively to spur domestic investment and economic growth.

The Public Investment Theory, proposed by Aschauer (1989), emphasizes that government investment in infrastructure can crowd in private investment by improving productivity and reducing transaction costs. This theory is relevant to the present study as it helps explain whether rising public debt in East Africa enhances productive capacity or leads to debt overhang and crowding-out effects (Aschauer, 1989.

Methodology

Research Design

The study employed a longitudinal research design, which is strategic for capturing the dynamic evolution of external debt on investment in Eastern African Sub-Region Countries from 1990 to 2023. By employing a longitudinal framework, the research aimed to examine the trends, patterns, understand causality, and identify long-run equilibrium relationships and effects of public debt on investment, offering insights into how public debt (disaggregated into external debt and Debt Servicing) affects investment among Eastern African Sub-Region Countries (Menard, 2020; Caruana et al., 2021). Furthermore, the longitudinal design supports the application of panel econometric techniques, such as the Pooled Mean Group (PMG), Dynamic Fixed Effects (DFE), and panel cointegration models that distinguish short-run adjustments from long-run relationships

Research paradigm

The study adopted the positivist research paradigm to examine the effect of external debt on Domestic investments in Eastern African Sub-Region Countries (EACs) from 1990 to 2023. Positivism emphasizes objectivity, empirical measurement, and the use of statistical techniques to establish causal relationships, making it highly suitable for analysing the debt–investment nexus. Its strength lies in providing verifiable and generalizable findings, as it relies on time-series and panel data to uncover trends across multiple countries. This paradigm aligns with the study's focus on quantifying how external debt influences domestic investment, thereby enabling evidence-based policy recommendations

Nature and Sources of Data

The study employed quantitative secondary data collected from reputable international and regional statistical sources. The data are of a panel nature, covering multiple Eastern African Sub-Region Countries over the study period, which allowed for both cross-country and time-series analysis. The variables include domestic investment (DIV), external debt (ED), debt servicing (DS), bank credit (BCR), interest rate (IR), and inflation (INF). The primary source of data for this study was the World Development Indicators (WDI) database maintained by the World Bank. This repository offers reliable, consistent, and comprehensive macroeconomic data that is essential for empirically analysing the effect of public debt on investment across Eastern African Sub-Region Countries.

Model Specification

In line with the Debt Overhang Theory, the study specifies an empirical model to examine the effect of external debt on Domestic investment in Eastern African Sub-Region Countries over the period 1990–2023. The model incorporates both domestic investment (DIV) dependent variables representing total investment performance, while external debt, debt servicing, and bank credit serve as key indicators of public debt. Inflation rate and interest rate are included as control variables to capture macroeconomic stability influences.

The functional form of the model is expressed as;

$$INV_{it} = f(EXTD_{it}, DSER_{it}, BCRED_{it}, INFR_{it}, INTR_{it}) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots. (1)$$

Where:

- INV_{it}= Investment (FDI) in country i at time t)
- ED_{it}= External debt (% of GDP)
- DS_{it}= Debt servicing (% of GDP)
- BCR_{it}= Bank credit to private sector (% of GDP)
- INF_{it}= Inflation rate (annual %)
- IR_{it}= Interest rate (annual %)

The empirical estimation model can be represented in a log-linear dynamic panel form as:

$$\ln INV_{it} = \alpha_i + \beta_1 \ln ED_{it} + \beta_2 \ln DS_{it} + \beta_3 \ln BCR_{it} + \beta_4 INF_{it} + \beta_5 IR_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots (2)$$

Where:

- α_i= country-specific fixed effects
- ε_{it}= error term capturing other unobserved factors, β_1 to β_5 are the slope coefficients of the variables ED, BCR, DS, IR, and INF, and β_0 is the intercept term or the autonomous parameter estimate. Note: $i = 1,2,\dots N$ representing cross sections, ; $t = 1,2,\dots,T$ representing periods. μ_i is the error term and $\mu_i \sim N(0, \sigma_\varepsilon^2)$.

Techniques (or Procedure) for Data Analysis

Variables Trend Analysis

Trend analysis was a critical component of this study, serving as a preliminary diagnostic tool to examine the historical behaviour and progression of key variables, External Debt (ED), Debt Servicing (DS), Domestic Investment (DIV), Bank credit to domestic economy (BCR), Inflation (INF) and Interest Rate (IR) across the Eastern African Sub-Region Countries over the period 1990 to 2023. This analysis enabled a visual and interpretive understanding of the evolving relationship between public debt and investment prior to formal econometric modelling. Trend analysis enabled the researcher to identify long-term movements, structural shifts, and cyclical patterns in data over time (Gujarati & Porter, 2009).

Cross-sectional Dependence Test

The Pesaran (2004) Cross-Sectional Dependence (CD) test offers a rigorous methodological approach to addressing this issue, ensuring the robustness and validity of the econometric analysis undertaken in the study. The Pesaran CD test is designed to detect the presence of cross-sectional dependence in panel data models, which is crucial for choosing appropriate estimation techniques and avoiding misleading inferences. The test statistic is defined as:

$$CD = \sqrt{\frac{2}{T(N-1)N}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij}$$ ……………………………………………………………………(3)   Where: T is the number

of time periods; N is the number of cross-sectional units $\hat{\rho}_{ij}$ is the sample correlation of the residuals between cross-sections i and j.

Panel Unit Root Test

The Pesaran CIPS test is designed to account for cross-sectional dependence in panel datasets, an advancement over first-generation unit root tests that assume cross-sectional independence. This feature is particularly relevant for studies involving countries within a region like East Africa, where economic, political, and financial developments in one country can influence or be influenced by those in neighbouring countries (Im, Pesaran, & Shin, 2003; Levin, Lin, & Chu, 2002). The mathematical specification for a unit root test in a panel setting, which the CIPS test modifies, typically starts with the following model for each cross-sectional unit i:

$$\Delta y_{it} = \alpha_i + \beta_i t + \gamma_i y_{it-1} + \sum_{k=1}^{p_i} \delta_{ik} \Delta y_{it-k} + \varepsilon_{it}$$ ....(4)   Here, y_{it} represents the

variable of interest (e.g. DOI, ED, DS, BCR, INF, IR) for country i at time t, Δ is the difference operator, α_i is the individual effect, $\beta_i t$ captures a time trend, and ε_{it} is the error term. The term $\gamma_i y_{it-1}$ tests for the unit root presence, where a statistically significant γ_i close to zero indicates stationarity. The CIPS statistic is calculated based on the augmented Dickey-Fuller (ADF) regressions for each cross-sectional unit and then averaging the individual unit ADF statistics. The CIPS test statistic is given as:

$$CIPS = \frac{1}{N} \sum_{i=1}^{N} t_{\gamma i}$$ ....(5)   where $t_{\gamma i}$ is the t-

statistic of the γi coefficient from each unit's ADF regression, and N is the number of cross-sectional units in the panel.

Panel Cointegration Test

The panel bounds cointegration test is a crucial econometric technique employed in panel data settings to determine whether a long-run equilibrium relationship exists among the variables under study.

Mathematically, the panel ARDL bounds test is derived from the unrestricted error correction model (UECM) of the form:

$$\Delta y_{it} = \alpha + \sum_{j=1}^{p} \beta_j \Delta y_{it-j} + \sum_{k=0}^{q} \gamma_k \Delta x_{it-k} + \sum_{l=0}^{r} \delta_l \Delta q_{it-l} + \lambda_1 y_{it_{-1}} + \lambda_2 x_{it-1} + \lambda_3 q_{it-1} + \varepsilon_{it} . (6)$$

Where: y_{it} is the dependent variable Investment (FDI, D_INV), x_{it-k} are the independent variables (ED, DS, BCR), q_{it-l} are the control variables (IR, INF) Δ denotes the first difference, $\lambda_1, \lambda_2, \lambda_2$ capture the long-run relationships, ε_{it} is the error term. The null hypothesis of no cointegration is given by, $H_0: \lambda_1 = \lambda_2 = 0$ (No long-run relationship) The alternative hypothesis is: $H_1: \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq 0$ (Existence of long-run relationship)

Mean Group (MG) Estimator

This estimator allows each country to have its intercept, slope coefficients, and error variances, recognizing the distinct economic and regulatory environments that could influence how public debt affects investment (Blackburne & Frank, 2007).

For each country i in the panel, the MG estimator models the relationship as:

$y_{it} = \alpha_i + \beta_i x_{it} + \delta_i q_{it} + \varepsilon_{it}$ …………………………………………………………………..(7) where y_{it} represents the dependent variable (INV), x_{it} is a vector of independent variables (external debt), and q_{it} is a vector of control variables α_i, β_i and δ_i are country-specific intercepts and slopes, and ε_{it} are error terms.

Pooled Mean Group (Panel ARDL) Specification

The mathematical foundation of the PMG approach is anchored in the Autoregressive Distributed Lag (ARDL) modelling framework, applied to panel data. The ARDL model can be expressed as:

$$\Delta y_{it} = \theta_i \left(y_{i,t-1} - \gamma_i x_{i,t-l} \right) + \sum_{j=0}^{p-1} \beta_j \Delta y_{it-j} + \sum_{k=0}^{q-1} \gamma_k \Delta x_{it-k} + \sum_{l=0}^{r-1} \delta q_{it-l} + \mu_i + \varepsilon_{it} \dots \dots \dots \dots (8)$$

Δ denotes short-run changes; y_{it} is investment; x_{it} represents explanatory variables like external debt, interest rate, and inflation; θ captures the speed of adjustment toward long-run equilibrium; γ denotes long-run elasticities; β, γ_k, and δ measure short-run effects; μ_i represents country-specific effects; and ε_{it} is the random error term. Δ indicates differencing, p and q, r, are lag orders, μ_i captures country-specific effects, and is the error term. The terms $\theta_i(y_{i,t-1} - \gamma_i x_{i,t-l})$ capture the long-term relationship between the dependent and independent variables, while the differenced terms allow for short-term dynamics.

For **Foreign Direct Investment (FDI):**

$$\Delta FDI_{it} = \alpha_i + \phi_1 \Delta FDI_{i(t-1)} + \theta_1 \Delta ED_{it} + \theta_2 \Delta DS_{it} + \theta_3 \Delta BCR_{it} + \theta_4 \Delta IR_{it} + \theta_5 \Delta INF_{it}$$
$$+ \lambda \left(FDI_{i(t-1)} - \gamma_1 ED_{it} - \gamma_2 DS_{it} - \gamma_3 BCR_{it} - \gamma_4 IR_{it} - \gamma_5 INF_{it} \right) + \mu_i$$
$$+ \varepsilon_{it} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (9)$$

where: Δ represents the first difference operator, capturing the change in variables from one period to the next, α_i in the FDI model, is the intercept term may vary across countries, and γ_{kj} (for k=1,2,3) are the short-term and long-term coefficients on the lagged differences and levels of the dependent and independent variables, respectively. ε captures the speed of adjustment to the long-term equilibrium, μ_i is the Stochastic error term.

Diagnostic Tests

In this study, diagnostic tests were conducted to validate the reliability and robustness of the Panel ARDL (Pooled Mean Group) model, given the heterogeneous characteristics of the Eastern African Sub-Region Countries. The tests confirmed the absence of serial correlation and heteroskedasticity, while residuals were found to be normally distributed, ensuring the model was correctly specified. Stability tests further demonstrated that model parameters remained consistent over time, enhancing confidence in the estimates.

Results

Multi-country Panel Trend Overview of debt and investment in the Eastern African Sub-Region Countries
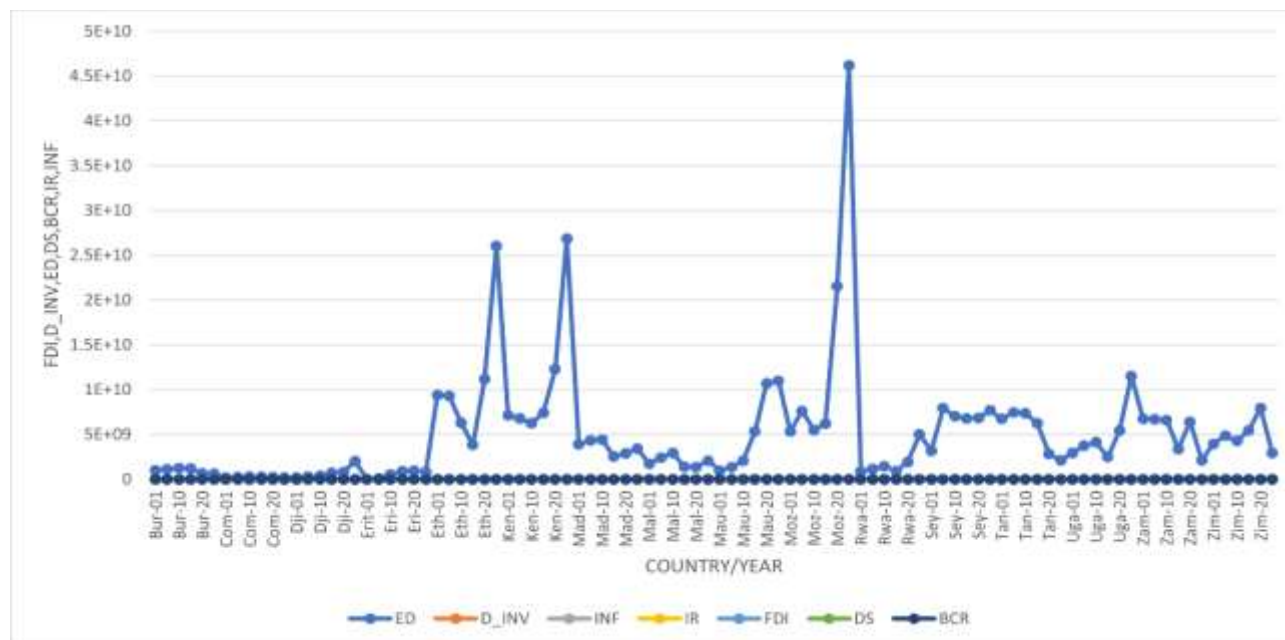
Figure 1: Multi-country Panel Trends

Source: Author's Computation using Excel (2025)

The chart reveals that external debt dominates investment trends in East Africa, with sharp increases in Ethiopia, Kenya, and Mozambique due to heavy borrowing for infrastructure. FDI and bank credit remain relatively flat, reflecting weak domestic financial mobilization. Countries like Burundi and Eritrea show low debt and investment, constrained by fragile fiscal systems. Limited bank credit underscores underdeveloped financial sectors, while inflation and interest rate fluctuations add volatility. Empirical evidence (Mensah et al., 2022; Akinola & Egbetunde, 2021; Fosu, 2021) supports these findings, showing that external debt can boost investment short term but crowds out domestic investment when debt servicing rises. Sustainable outcomes require prudent debt management and stronger financial intermediation.

Table 1: PMG Hausman Specification Test

Null hypothesis: Estimator is statistically similar to the PMG estimator

Estimator	Stat.	DOF	p-Value
Mean Group	2.133880	5	0.8303

Source: Researcher's Computation Using Eviews 13 (2025)

The PMG Hausman Specification Test (Table 1) yielded a statistic of 2.1339 with 5 degrees of freedom and a p-value of 0.8303, exceeding the 5% significance level. Thus, the null hypothesis is not rejected, confirming that the PMG and MG estimators are statistically similar. This validates the PMG approach for the study, indicating that while short-run debt–investment dynamics vary among Eastern African Sub-Region Countries, their long-run relationships converge. This convergence reflects common structural and macroeconomic conditions such as dependence on external borrowing and shared fiscal challenges. Comparable findings by Ndoricimpa (2020), Asteriou et al. (2020), and Mensah et al. (2019) affirm that PMG effectively captures uniform long-run effects of public debt on investment across regions, supporting debt overhang and crowding-out theories.

Table 2: Cross-Section Dependency Test

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in residuals

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	581.4133	120	0.0000
Pesaran scaled LM	29.78410		0.0000
Pesaran CD	17.13644		0.0000

Source: Researcher's Computation using Eviews 13

Table 2 reports the cross-section dependency test results, where the null hypothesis of no cross-sectional dependence was rejected at the 1% significance level across all three tests: Breusch-Pagan LM (581.41, p = 0.0000), Pesaran Scaled LM (29.78, p = 0.0000), and Pesaran CD (17.14, p = 0.0000). This confirms strong interdependence among Eastern African Sub-Region Countries, implying that economic shocks or policy changes in one country significantly influence others' investment dynamics. Consequently, employing second-generation panel estimators like PMG is justified. These findings concur with Maugu (2023) and Gichigo (2023), who observed regional debt and policy spillovers due to integration, though contrasting with Magumisi (2021) in Zimbabwe, where such linkages were weak. Overall, the results highlight the interconnected nature of East African economies.

Table 3: Panel Unit Root Result

Pesaran CIPS					
Variables	**Level Intercept & Trend**	**5% Critical Value**	**First Diff Intercept & Trend**	**5% Critical value**	**Decision Order of Integration**
ED	-2.428	-2.75	-2.852	-2.75	I(1)
DS	-2.702	-2.75	-3.269	-2.75	I(1)
FDI	-3.140	-2.75	Nil	Nil	I(0)
INF	-4.180	-2.75	Nil	Nil	I(0)
IR	-2.342	-2.75	-2.890	-2.75	I(1)
BCR	-1.901	-2.75	-3.482	-2.75	I(1)

Source: Researcher's Computation Using EViews-13 (2025)

The unit root test results show that external debt (ED) was non-stationary at levels (t = –2.428 > –2.75) but became stationary after first differencing (t = –2.852 < –2.75), indicating long-term persistence. Similarly, debt servicing (DS) was non-stationary at levels (t = –2.702 > –2.75) but stationary after first differencing (t = –3.269 < –2.75). In contrast, foreign direct investment (FDI) was stationary at levels (t = –3.140 < –2.75), showing mean reversion. Inflation (INF) was also stationary at levels (t = –4.180 < –2.75), while interest rate (IR) and bank credit (BCR) became stationary only after first differencing (t = –2.890 and –3.482 < –2.75, respectively). These mixed integration levels (I(0) and I(1)) justify using the Panel ARDL model, consistent with earlier findings by Aswata et al. (2018), Maugu (2023), Ndoricimpa (2020), Dacka (2016), and Ezeaku et al. (2023

Table 4: Panel Bounds Test Co-Integration Result

F-statistic: 8.220**

Sample Size	10%		5%		1%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
30	2.525	3.560	3.058	4.223	4.280	5.840
Asymptotic	2.200	3.090	2.560	3.490	3.290	4.370

* I(0) and I(1) are respectively the stationary and non-stationary bounds.
Source: Researcher's Computation Using EViews-13 (2025)

Table 4 shows that the Panel Bounds Test confirms a long-run equilibrium relationship between external debt, debt servicing, macroeconomic variables, and investment in Eastern African Sub-Region Countries. The F-statistic (8.220, p < 0.05) exceeds the upper I(1) bound, rejecting the null of no co-integration. This indicates that, despite short-run fluctuations, a stable long-run

relationship links external debt to investment. These findings align with Ndoricimpa (2020) and Were (2018), who found persistent debt effects on investment, and with Aswata et al. (2018), who reported similar co-integration patterns. However, they differ from Dacka (2016), who noted weaker links in some Sub-Saharan countries. Overall, the results affirm external debt's structural influence on long-term investment in East Africa.

Table 5: Foreign Direct Investment Model: PMG (Panel ARDL) Result

Dependent Variable: D(FDI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Long-run (Pooled) Coefficients				
DS	-1.357619	0.092864	-14.61936	0.0000
ED	0.748336	0.060206	12.42961	0.0000
INF	-0.008457	0.009980	-0.847417	0.3968
IR	0.059849	0.015115	3.959697	0.0001
BCR	0.155530	0.018709	8.313171	0.0000
Short-run (Mean-Group) Coefficients				
COINTEQ	-0.995045	0.215333	-4.620958	0.0000
D(FDI(-1))	0.145703	0.174849	0.833310	0.4047
D(DS)	2.195347	0.850702	2.580629	0.0099
D(ED)	0.397190	0.139688	2.843408	0.0044
D(INF)	-0.337329	0.088767	-3.800162	0.0001
D(IR)	-0.171181	0.118746	-2.283706	0.0224
D(BCR)	0.248067	0.119298	2.079389	0.0349
C	7.186839	2.223495	3.232226	0.0013
@TREND	-0.062931	0.072300	-0.870410	0.3841

The results indicate a highly significant model (Log-Likelihood = -337.67) with both long-term persistent relationships and short-term dynamic effects in the data.
Source: Researcher's Computation Using EViews-13 (2025)
Log-Likelihood: -337.6741

The Panel ARDL (PMG) results reveal that debt servicing negatively affects FDI in the long run ($\beta = -1.358$, $p < 0.01$), while external debt has a positive impact ($\beta = 0.748$, $p < 0.01$), indicating that productive borrowing enhances FDI, but high repayment burdens discourage it. Bank credit ($\beta = 0.156$, $p < 0.01$) and interest rates ($\beta = 0.060$, $p < 0.01$) positively influence FDI, while inflation shows a negative but insignificant effect. The error correction term (-0.995, $p < 0.01$) confirms strong long-run stability. These findings, consistent with Were (2018), Ndoricimpa (2020), and Asiedu (2002), highlight that prudent debt management and financial development enhance FDI inflows.

Table 6: Result of the Diagnostic Test

Normality Test			Decision	Remarks
Jarque-Bera Test	0.891	Prob 0.641	Prob > 0.05	Normally distributed
Serial Correlation LM Test				
F Statistics	3.368	Prob 0.112	Prob > 0.05	Abs of Serial Correlation
Homoskedasticity Test				
Breuch-Pagan-Godfrey Test	1.037	Prob 0.512	Prob > 0.05	Abs of Heteroskedasticity

Source: Researcher's Computation Using EViews-13 (2025)

The diagnostic results confirm that the Panel ARDL model is statistically reliable and well-specified. The Jarque-Bera test (0.891, p = 0.641) indicates normally distributed residuals, while the Serial Correlation LM Test (F = 3.368, p = 0.112) confirms the absence of autocorrelation. The Breusch-Pagan-Godfrey test (1.037, p = 0.512) shows homoskedasticity of error terms. These results align with Pesaran et al. (2001) and Baltagi (2021), affirming estimator efficiency and validity. Similar outcomes in Were (2018) and Mensah et al. (2019) validate the model's robustness for policy analysis, ensuring credible and consistent economic interpretations.

Discussion of the findings
The study's findings indicate that external debt plays a dual role in East African economies. The long-run results from the Panel ARDL (PMG) reveal that debt servicing negatively affects FDI ($\beta = -1.358$, $p < 0.01$), confirming that high repayment obligations crowd out foreign investment by signaling macroeconomic vulnerability (Were, 2018; Ndoricimpa, 2020). Conversely, external debt itself positively influences FDI ($\beta = 0.748$, $p < 0.01$), suggesting that productive borrowing, particularly for infrastructure and development projects, attracts foreign investors (Asiedu, 2002; Adegbite et al., 2008). Similarly, bank credit and interest rates are positively associated with FDI, highlighting the importance of financial development and stable credit systems. Short-run dynamics indicate that temporary debt inflows and restructuring may temporarily stimulate FDI, while inflation and sudden interest rate increases deter it, reflecting short-term macroeconomic sensitivity. These results corroborate prior studies (Mensah et al., 2022; Maugu, 2023; Dacka, 2016), which emphasize that debt management, rather than debt accumulation alone, determines investment outcomes. The cross-sectional dependency tests reveal strong interdependence among Eastern African Sub-Region Countries, confirming regional spillovers and policy linkages (Gichigo, 2023). Unit root and bounds tests validate the mixed-order integration and long-run co-integration among the variables, justifying the use of Panel ARDL (Pesaran et al., 2001; Baltagi, 2021).

Conclusion

The study concludes that external debt affects investment in East Africa through a nuanced mechanism: while productive borrowing promotes FDI, high debt servicing burdens suppress it. Financial development, particularly through bank credit, reinforces investment inflows. Regional economic interdependence underscores the need for coordinated debt management and macroeconomic stability to sustain investment.

Recommendations

Governments should prioritize productive external borrowing and limit debt servicing pressures to attract long-term FDI.

Strengthening financial institutions and expanding credit access can enhance domestic absorptive capacity for foreign investment.

Regional coordination on fiscal and debt policies is essential to mitigate cross-country spillovers and promote investment stability.

Areas for Further Research

Future studies could explore the impact of domestic investment dynamics on debt-FDI relationships, assess sector-specific effects of external debt on FDI, and examine the role of political stability and governance in moderating debt–investment linkages in East Africa

Contribution to knowledge

This study contributes to knowledge by empirically demonstrating the dual role of external debt in East Africa: productive borrowing stimulates foreign direct investment, while high debt servicing constrains it. It highlights the importance of debt management, financial development, and regional interdependence, providing evidence-based insights for policymakers on optimizing debt strategies to enhance sustainable investment inflows

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