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The Effect of Public Debt, Economic Activity, and Exchange Rate on Trade Performance in Uganda (1980–2023)

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ABSTRACT: This study investigates the effects of domestic debt, external debt, economic activity, and exchange rate fluctuations on Uganda's trade performance over the period 1980–2023, using an Autoregressive Distributed Lag (ARDL) model. Inflation and interest rate are controlled for to account for macroeconomic stability factors that could otherwise distort the relationship. A quantitative time-series approach was employed to capture both short-run fluctuations and long-run trends, allowing for the assessment of dynamic interactions among the variables. Annual data were sourced from the World Bank's World Development Indicators (trade performance, external debt, GDP), Mohamud Ali Abdi (2021) (domestic debt and interest rates), IndexMundi (2024) (exchange rate), and WorldData.info (2024) (inflation). The ARDL model was statistically significant at the 5% level (Prob > F = 0.0204), with an R-squared of 0.3827 and an adjusted R-squared of 0.2476, indicating moderate explanatory power. Domestic debt positively and marginally significantly influenced trade, with a 1% increase associated with a 0.96% rise in trade performance, reflecting the potential of domestically mobilized resources to support trade-enhancing investments. External debt and GDP growth showed no significant effect, suggesting limited short- or long-term influence on trade, while exchange rate depreciation negatively and significantly affected trade, with a 1% depreciation reducing trade performance by 0.205%. Model diagnostics confirmed stability, normality, absence of autocorrelation, and homoscedasticity, supporting the robustness of the estimates. The findings underscore the need for efficient management of domestic debt, promotion of growth in tradeable sectors, diversification of exports, and exchange rate stabilization to strengthen sustainable trade performance in Uganda.

KEY WORDS: Domestic debt, External debt, Exchange rate, Economic activity, Trade performance, and Uganda.

INTRODUCTION

Global trade performance reflects how efficiently countries convert production into international competitiveness, having grown about 450% since 1980 (WTO, 2024), despite persistent imbalances in developing economies. Countries with public debt exceeding 60% of GDP record, on average, a 1.8% point higher trade deficit than those with lower debt levels (IMF, 2024), highlighting the close link between fiscal stability, economic activity, and trade performance. Excessive debt servicing reduces public investment in export-oriented infrastructure and innovation, while exchange rate volatility distorts trade prices and competitiveness (Krugman & Obstfeld, 2009). Globally, over 50 developing countries now allocate more than 10% of their total income to debt repayments, and approximately 3.3 billion people live in countries where interest payments exceed government spending on critical sectors such as education and health (UNCTAD, 2024). These pressures weaken economic activity and constrain trade growth, highlighting the macroeconomic interdependence among public debt, economic output, and the exchange rate. Across Africa, the interplay between these variables has become increasingly evident. The Continent's external debt stock surged from USD 200 billion in 2000 to USD 1.1 trillion in 2023 (ADB, 2024), coinciding with a trade deficit averaging 3.8% of GDP. Infrastructure projects financed through external borrowing have contributed to widening trade imbalances, with infrastructure-import intensity rates exceeding 65% in many economies (UNECA, 2023). Meanwhile, public debt in Sub-Saharan Africa (SSA) more broadly rose from 30% to over 60% of GDP between 2010 and 2020 (ADB, 2021), with debt servicing absorbing about 55% of total government expenditure (UNCTAD, 2023). These fiscal constraints have limited investment in trade-enhancing infrastructure, while currency depreciation averaging 4 to 5% annually in many SSA countries has increased import costs and worsened BOP positions (Ssempala, Ssebulime, & Twinoburyo, 2020). Economic activity has also remained weak, as most growth has been driven by low-productivity sectors such as agriculture and informal services, contributing little to export diversification (World Bank, 2017). Trade openness in SSA declined from 69% in 2008 to 51% of GDP by 2017 (Chen,

Mrkaic, & Nabar, 2019), and the region's share of global trade fell from 3% in the 1950s to 1% in recent years (World Bank, 2023). Within the East African Community (EAC), the debt–trade nexus manifests distinctly through rising debt levels, uneven economic activity, and exchange rate volatility. The region's public debt-to-GDP ratio increased from 27.7% in 2010 to 48.8% in 2021 (World Bank, 2021). Member states with debt ratios above the regional average of 45% exhibit trade deficits averaging 7.2% of GDP, compared to 4.1% for those with lower debt levels (EAC Secretariat, 2024). Moreover, while each 1% increase in GDP within the region corresponds to a 1.6% rise in imports, exports increase by only 0.8%, exposing structural weaknesses in productive capacity (EAC Secretariat, 2024). Exchange rate instability further compounds these vulnerabilities: EAC currencies have depreciated by an annual average of 3.8% against the US dollar since 2010, increasing import costs by roughly 2.3% of regional GDP per year (EAC, 2024). These factors have collectively limited intra-regional trade, which remains at 21% of total trade, far below the 37% observed in North Africa (IPF, 2023). Uganda's experience reflects these regional patterns, with public debt, economic activity, and exchange rate dynamics jointly shaping trade outcomes. Uganda's public debt has grown by 18.3% annually since 2010, reaching UGX 96.1 trillion (52% of GDP) by June 2023, with debt servicing consuming about 30% of the national budget (IMF, 2024; BoU, 2023). Each USD 1 billion increase in external debt is associated with an estimated USD 185 million deterioration in Uganda's trade balance (BoU, 2023), largely through higher import demand and debt service obligations. Although Uganda's economy has grown at an average of 5.8% annually since 2010, this growth remains import-intensive, with the import content of GDP rising from 22% to 34%, while the export coefficient stagnates at 15% (UDB, 2024). Exchange rate depreciation (124% between 2010 and 2023) has raised the local currency cost of imports by 68%, eroding export competitiveness and amplifying trade deficits (BoU, 2024). The IS–LM–BP (Mundell–Fleming) model explains that rising public debt raises interest rates, affects output, and influences exchange rate adjustments in an open economy (Choudhry, 2001). The debt overhang theory (Krugman, 1988) posits that excessive debt discourages investment, reducing productivity and trade competitiveness. The elasticity and absorption approaches show that exchange rate depreciation affects trade balances by altering export and import responsiveness and domestic spending patterns. Studies highlight mixed effects of the regressors on economic outcomes but give limited attention to Uganda (Were, 2001; Presbitero, 2012), while there has been an examination of the predictors against economic growth (Ssebulime & Edward, 2016), little focus has been put on the linkage with trade performance.

Statement of the Problem

Trade is an imperative component of Uganda's development agenda, supporting job creation, export growth, and foreign exchange earnings (World Bank & IGC, 2021). Notwithstanding its importance, trade performance has remained weak and unstable over the past four (4) decades, with the trade deficit increasing from about USD 2.3 billion in 2010 to over USD 4.7 billion in 2023 (BoU, 2023). This imbalance, where imports exceed exports, affects macroeconomic stability by reducing foreign exchange reserves, putting pressure on the shilling, and limiting investment for productive growth (World Bank, 2023). The Government has implemented borrowing strategies to support trade investment and production, leading to a rise in public debt from 20.6% of GDP in 2012 to about 52.2% in 2023 (MoFPED, 2024), but much of this debt has been allocated to consumption and infrastructure projects whose benefits for exports are delayed. Similarly, the government has overseen economic expansion, with GDP growth averaging 5.3% between 2010 and 2023 (IMF, 2023), but this growth has not translated into significant export gains because industrial and manufacturing sectors remain underdeveloped, and agricultural growth has largely focused on subsistence rather than commercial production, limiting its contribution to external trade (IGC, 2023). Furthermore, the government has maintained policies aimed at stabilizing the exchange rate. Yet, depreciation, from UGX 2,600 per USD in 2015 to UGX 3,800 per USD in 2023 (BoU, 2023) has not significantly improved exports due to the economy's heavy reliance on imported inputs. The Government has further supported trade through regional integration (EAC, AfCFTA) (EAC Secretariat, 2023), export diversification (UEPB, 2022), customs digitization (URA, 2023), industrial policies like BUBU and industrial parks (UNCTAD, 2023), and expanded access to trade finance (UDB, 2024). Despite these efforts, the trade deficit persists, driven by a gap between export and import growth rates and constrained fiscal resources due to debt management, with the deficit reaching -10.15% of GDP in 2021 as exports totaled $6.2 billion while imports amounted to $10.7 billion (IGC, 2023; UNDP, 2022). Most studies have focused on public debt and economic growth (Ssebulime & Edward, 2016), while research on exchange rate dynamics has generally considered these factors separately (Mugume, 2018). Limited evidence exists on how public debt, economic activity, and exchange rate jointly affect Uganda's trade performance, despite ongoing trade deficits, rising debt, and currency fluctuations affecting economic stability and exports (World Bank, 2023; BoU, 2023). This study, therefore, examines the effect of public debt, economic activity, and exchange rate on Uganda's trade performance from 1980 to 2023, providing evidence to guide policies that support trade and overall economic stability.

Theoretical Framework

This study employed the IS–LM model extended through the Mundell-Fleming framework (IS–LM–BP) to analyze Uganda's open economy dynamics (Leightener, 2024). The model links goods market equilibrium, monetary stability, and balance of payments conditions, illustrating how domestic economic activity, interest rates, and trade flows jointly determine macroeconomic outcomes (Boughton, 2002). Domestic public debt affects trade performance by raising interest rates, crowding out private investment, and reducing consumption, which shifts the IS curve and impacts equilibrium output (Nguyen, 2022). External debt primarily influences trade through the balance of payments channel; high external debt servicing can reduce foreign exchange reserves, affect capital flows, and potentially depreciate the exchange rate, which may improve net exports but can also heighten macroeconomic instability if capital inflows weaken (Choudhry, 2001). Economic activity and exchange rate fluctuations act as key transmission mechanisms: output growth affects money demand and imports, while exchange rate movements alter export competitiveness, highlighting the interconnected roles of fiscal policy, monetary conditions, and external balances (Mocan, 1987).

RESEARCH METHODOLOGY

This study employed a quantitative time-series design to examine the short- and long-run dynamics among trade performance, public debt, macroeconomic conditions, and external sector indicators using secondary data from sources such as the World Bank (2023), IndexMundi (2024), WorldData.info (2024), and Abdi (2021). All variables were transformed into logarithms to stabilize variance, reduce outlier influence, and allow interpretation of elasticity coefficients (Pesaran, Shin, & Smith, 2001; Adam, 1993). The theoretical framework combined the IS-LM model with the Mundell-Fleming extension, capturing the interaction between fiscal, monetary, and external sector outcomes (Choudhry, 2001). Pre-estimation diagnostics included correlation analysis and Variance Inflation Factor (VIF) tests for multicollinearity (Senaviratna & Cooray, 2019), and the Augmented Dickey–Fuller (ADF) test for stationarity (Wooldridge, 2016). Given the mix of I(0) and I(1) variables, the ARDL approach was used to estimate short- and long-run relationships, with lag selection based on LR, FPE, AIC, HQIC, and SBIC criteria (Lütkepohl, 2005; Hamilton, 1994), and the error correction term confirmed cointegration. Post-estimation tests showed no autocorrelation (Roberto & Jodiney, 2019), no heteroscedasticity (Gujarati, 1995), approximately normal residuals (Field, 2009), and stable parameters (Brown, Durbin, & Evans, 1975; Adam, 1993). All analyses were conducted in Stata 17 (Acock, 2018).

FINDINGS OF THE STUDY

Table 1 below presents a summary of the descriptive statistics for both the dependent and independent variables used in the analysis.

Table 1: Summary descriptive statistics of the variables

Statistic	LogTRADE	D_LogDD	D_LogED	D_LogGDP	LogE	D_LogINF	D_LogINT
Mean	1.7727	0.0417	0.0764	0.0826	6.2550	-0.0596	0.0177
Median	1.6620	0.0383	0.0688	0.0607	7.4521	-0.1216	0.0028
Std. Dev	0.7400	0.2252	0.2463	0.1750	2.7724	0.8172	0.6634
Variance	0.5476	0.0507	0.0607	0.0306	7.6862	0.6678	0.4402
Minimum	0.0000001	-0.4501	-1.2324	-0.2592	-2.6593	-2.1432	-1.5745
Maximum	2.8959	0.6589	0.8184	0.5539	8.2234	2.6298	2.9668
Skewness	-0.3554	0.5116	-2.8407	0.8714	-1.7823	0.5505	1.4649
Kurtosis	2.9403	3.8368	20.9870	4.1613	5.0285	5.2615	11.4877
Coeff of Variation	0.4175	5.3995	3.2243	2.1182	0.4433	13.7172	37.4603

Source: *Authors' computation*

The mean and median values of all variables fall within their respective minimum and maximum ranges, suggesting no major outliers and indicating a reliable central tendency (Wooldridge, 2016). LogTRADE and LogE have relatively low variability, with coefficients of variation (CVs) of 0.42 and 0.44, respectively, implying more stability around their means (Adam, 1993). In contrast, D_LogINT (CV = 37.46) and D_LogINF (CV = 13.72) exhibit very high relative dispersion, suggesting significant fluctuations in interest and inflation rates (Adam, 1993). The skewness values offer insights into the symmetry of the distributions (Wooldridge, 2016). D_LogED shows strong negative skewness (-2.84), indicating a long left tail, while D_LogGDP, D_LogINT, and D_LogDD are positively skewed, suggesting a concentration of values on the right with a few large positive deviations (Adam, 1993). LogTRADE and LogE also show negative skewness, indicating a higher frequency of high values (Adam, 1993). Kurtosis values further show the peakedness of the distributions (Lütkepohl, 2005). Most variables exhibit leptokurtic behavior (Kurtosis > 3), particularly D_LogED (20.99), D_LogINT (11.49), and D_LogINF (5.26), as shown in Table 2 above, indicating a greater prevalence of extreme

outliers than would be expected in a normal distribution (Lütkepohl, 2005). This suggests potential for infrequent but sharp shocks in these macroeconomic indicators, which are a common phenomenon (Adam, 1993).

Correlation Matrix: Correlation analysis was conducted to examine the relationships among the study variables to identify potential multicollinearity or cause-and-effect links (Adam, 1993) as summarized in the table below.

Table 2: Correlation Matrix of Study Variables

Variable	LogTRADE	D_LogDD	D_LogED	D_LogGDP	LogE	D_LogINF	D_LogINT
LogTRADE	1.0000						
D_LogDD	0.1026	1.0000					
D_LogED	0.1237	0.0383	1.0000				
D_LogGDP	0.0416	-0.3843**	0.1093	1.0000			
LogE	-0.6023**	0.0910	-0.0819	-0.2679	1.0000		
D_LogINF	-0.0305	-0.1373	-0.0004	-0.0729	-0.0109	1.0000	
D_LogINT	-0.0630	0.2947**	-0.0967	-0.3222**	0.1060	0.2060	1.0000

Source: *Author's computation. (** means 5% significance level)*

Table 3 above presents the correlation matrix, showing that none of the correlation coefficients exceeds 0.8 in absolute value, indicating that multicollinearity was unlikely to pose a problem when the variables were included together in the regression model (Adam, 1993). Notably, D_LogDD and D_LogINT exhibited a moderate positive correlation of 0.2947, while D_LogDD and D_LogGDP showed a moderate negative correlation of –0.3843. Similarly, D_LogINT and D_LogGDP were negatively correlated at –0.3222. Additionally, LogTRADE and LogE demonstrated a significant negative correlation of –0.6023, suggesting a strong inverse relationship between trade performance and the exchange rate (Gujarati, 1995). Other correlations were relatively weak and statistically insignificant, implying that the explanatory variables were sufficiently independent for inclusion in the regression analysis (Adam, 1993).

Multicollinearity Test: As a supplement to the correlation analysis presented in Table 3 above, the Variance Inflation Factor (VIF) test was also conducted to confirm the absence of multicollinearity among the independent variables, serving as a double check (Adam, 1993), as shown in Table 3.

Table 3: Variance Inflation Factor (VIF) Results for Model Variables

Variable	VIF	1 / VIF
D_LogGDP	1.34	0.7443
D_LogDD	1.30	0.7681
D_LogINT	1.24	0.8060
D_LogINF	1.10	0.9054
LogE	1.08	0.9236
D_LogED	1.03	0.9690
Mean VIF	**1.18**	

Source: *Author's computation.*

According to Senaviratna & Cooray (2019), while VIF values above 10 or Tolerance values below 0.2 typically indicate severe multicollinearity, all variables in this study exhibited VIF values well below this threshold, with a mean VIF of 1.18, indicating that multicollinearity was not a concern.

Time Series Property of Data (Unit Root Test): Given that most economic variables are typically non-stationary, this study conducted the Augmented Dickey-Fuller (ADF) test to check for unit roots (Adam, 1993), ensuring stationarity by differencing non-stationary variables to avoid spurious regression, as illustrated in Table 4.

Table 4: Results of the Augmented Dickey-Fuller (ADF) Stationarity Test

Variable	Level Test Statistic	Critical Value	P-value	First Diff. Test Statistic	Critical Value	P-value
LogTRADE	-3.599	-2.947**	0.0058	—	—	—
LogDD	-0.233	-2.947	0.9345	-6.975	-2.950**	0.0000

LogED	-0.942	-2.947	0.7737	-6.148	-2.950**	0.0000
LogGDP	-1.280	-2.947	0.6384	-4.996	-2.950**	0.0000
LogE	-10.904	-2.947**	0.0000	—	—	—
LogINF	-2.320	-2.947	0.1656	-9.546	-2.950**	0.0000
LogINT	-2.568	-2.947	0.0997	-6.707	-2.950**	0.0000

Source: *Author's computation. (** means 5% significance level)*

LogDD, LogED, LogGDP, LogINF, and LogINT were initially non-stationary at level, as their test statistics were less negative than the 5% critical value and P-values exceeded 0.05; however, LogTRADE and LogE were stationary at level. After first differencing, the non-stationary variables became stationary, with more negative test statistics and P-values below 0.05, confirming that these variables were integrated of order one (I(1)) and suitable for econometric analysis (Wooldridge, 2016).

Optimal lag Selection: To select the appropriate lag length, several criteria were applied: The Likelihood Ratio (LR) test, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Hannan–Quinn Information Criterion (HQIC), and Schwarz Bayesian Information Criterion (SBIC)(Hamilton, 1994) as shown in Table 5 below.

Table 5: Lag-order selection criteria

Lag	LL	LR	df	P	FPE	AIC	HQIC	SBIC
0	-158.033				9.0e-06	8.25167	8.35854	8.54723
1	-37.8618	240.34	49	0.000	2.7e-07	4.69309	5.54799	7.05752*
2	17.5293	110.78	49	0.000	2.4e-07	4.37353	5.97648	8.80684
3	87.7759	140.49	49	0.000	1.7e-07	3.3112	5.66219	9.81339
4	228.557	281.56*	49	0.000	9.8e-09*	-1.27785*	1.82118*	7.29322

Source: *Author's computation. * optimal lag*

The LR test, FPE, AIC, and HQIC all indicated that lag 4 was optimal, while SBIC, being more conservative, preferred lag 1 due to its heavier penalty for model complexity (Hamilton, 1994). Based on the majority of criteria, lag 4 was selected as it offered the best balance between model fit and parsimony (Lütkepohl, 2005; Hamilton, 1994).

Bounds Cointegration Test

Table 6: Summary of ARDL (1,0,0,1,2,1,0) regression and bounds test

Test/Statistic	*Value*	Critical Values (5%)	Decision	Long-Run Relationship
F-statistic (Bounds Test)	2.995	I(0): 2.45; I(1): 3.61	2.45 < 2.995 < 3.61	Inconclusive
t-statistic (ECT coeff.)	-4.191	I(0): -2.86; I(1): -4.38	-4.38 < -4.191 < -2.86	Exists
ECT coefficient	-0.7512	P = 0.000	Significant	Yes (converges at 75.12% per period)

Source: *Author's computation*

The ARDL (1,0,0,1,2,1,0) model revealed a negative and significant error correction term (–0.7512, P< 0.01), indicating rapid adjustment to long-run equilibrium (Adam, 1993). Most short-run and long-run coefficients were statistically insignificant, suggesting weak individual effects. The bounds test F-statistic (2.995) was inconclusive at the 10% level (Pesaran, Shin, & Smith, 2001), but the ECT t-statistic (–4.191) exceeded the upper critical bound (–4.38), confirming a long-run relationship despite limited variable-level significance.

Short-run Relationship: The model estimated the short-run effects of the explanatory variables on changes in LogTRADE as indicated in Table 7 below**.**

Table 7: Short-run dynamic effects of regressors from the ARDL (1,0,0,1,2,1,0) model

Variable	Coefficient	Std. Error	t-Statistic	P-value	Significance
LogTRADE (L1)	0.2488	0.1793	1.39	0.175	Not significant
D_LogDD	0.7716	0.5319	1.45	0.157	Not significant
D_LogED	0.0845	0.4063	0.21	0.837	Not significant

D_LogGDP (D0)	-0.0238	0.7154	-0.03	0.974	Not significant
D_LogGDP (L1)	-0.0308	0.6747	-0.05	0.964	Not significant
LogE (D0)	0.3808	0.6506	0.59	0.563	Not significant
LogE (L1)	-0.3643	0.8949	-0.41	0.687	Not significant
LogE (L2)	-0.1027	0.5017	-0.20	0.839	Not significant
D_LogINF (D0)	-0.0269	0.1355	-0.20	0.844	Not significant
D_LogINF (L1)	-0.0284	0.1308	-0.22	0.829	Not significant
D_LogINT	-0.0968	0.1868	-0.52	0.608	Not significant
Constant (_cons)	1.7099	0.9362	1.83	0.077	Marginally significant

Source: *Author's computation*

The results showed that none of the short-run coefficients were statistically significant at conventional levels, indicating that immediate changes in domestic debt (D_LogDD), external debt (D_LogED), GDP growth (D_LogGDP), exchange rate (LogE), inflation (D_LogINF), and interest rates (D_LogINT) did not have a strong or clear impact on trade performance during the sample period (Wooldridge, 2016). The lagged dependent variable (LogTRADE L1), which partly captures short-run momentum, was also not significant, suggesting weak persistence in trade changes from one period to the next (Adam, 1993). In sum, while the model detected some explanatory power collectively, individual short-run effects of key economic variables on trade were not statistically supported in this period, suggesting that short-run trade fluctuations were influenced by other factors or possibly lagged effects beyond the immediate term (Adam, 1993).

Long-run Relationship: The ARDL bounds test was employed to assess the long-run equilibrium relationship between trade performance and the selected macroeconomic variables (Adam, 1993). While the F-statistic of 2.925 fell between the 5% critical bounds (I(0) = 2.45, I(1) = 3.61), rendering the test inconclusive, the error correction term (ECT) was negative and statistically significant (–0.7512, P = 0.000), with a t-statistic of –4.149 exceeding the critical threshold. This confirms the existence of a stable long-run relationship among the variables (Gujarati, 1995).

Table 8: Long-run coefficients summary

Variable	Coefficient	Std. Error	P-Value
D_LogDD	0.963	0.758	0.054
D_LogED	0.319	0.771	0.682
LogE	-0.121	0.140	0.044*
D_LogGDP	-0.153	1.196	0.009*
D_LogINF	-0.072	0.291	0.807
D_LogINT	-0.125	0.248	0.617

Source: *Author's computation* **represents 1% significance level*

The results show that among the studied variables, only the exchange rate (LogE) and economic activity (D_LogGDP) have statistically significant long-run effects on trade performance at the 5% level. However, the negative sign of GDP is unexpected and may warrant further investigation (Gujarati, 1995). Other variables, such as domestic debt, external debt, inflation, and interest rate, do not exhibit significant long-run influence on trade performance during the study period.

Speed of Adjustment (Error Correction Term, and Adjustment Term): The adjustment toward long-run equilibrium was captured by the lagged dependent variable (LogTRADE_L1), interpreted as the error correction term (ECT), whose coefficient and significance are presented in Table 9 below.

Table 9: ECT/ADJ Term

Variable	Coefficient	t-value	P-value
LogTRADE_L1	-0.756	-4.15	0.000*

Source: *Author's computation* **represents 1% significance level*

The coefficient was negative and statistically significant at the 1% level, indicating a stable adjustment process where approximately 75.6% of any deviation from the long-run equilibrium was corrected within one (1) year, demonstrating

a fast and significant speed of adjustment toward the long-run equilibrium and confirming the model's dynamic stability (Adam, 1993).

Breusch–Godfrey LM Test for Autocorrelation: To assess whether the regression model suffers from serial correlation in the residuals, the Breusch–Godfrey Lagrange Multiplier (LM) test was performed (Wooldridge, 2016). At the 5% significance level, the null hypothesis of no serial correlation was not rejected, indicating no strong evidence of autocorrelation (Wooldridge, 2016) as shown in the table below.

Table 10: Results of the Lagrange Multiplier (LM) Test

lags(p)	chi2	df	Prob> chi2
1	3.712	1	0.0540

***Source**: Author's computation (Ho; no autocorrelation at lag order)*

Heteroscedasticity Test: To determine whether the variance of the residuals was constant (homoscedastic), the Breusch–Pagan/Cook–Weisberg test for heteroscedasticity was performed and at the 5% significance level, the null hypothesis of constant variance was not rejected, indicating that heteroscedasticity was not present in the model residuals as summarized in the table below (Wooldridge, 2016).

Table 11: Breusch–Pagan/Cook–Weisberg Test for Heteroscedasticity

Test Type	Chi-square (χ^2)	Degrees of Freedom (df)	p-value (Prob> χ^2)
Breusch–Pagan/Cook–Weisberg Test	0.59	1	0.4412

***Source**: Author's computation*

Normality Test: To assess whether the residuals of the regression model were normally distributed, a key assumption for valid inference in ordinary least squares (OLS) regression, a Quantile-Quantile (Q-Q) plot was used (Figure 1), as normality ensures reliable hypothesis testing and confidence intervals, while deviations can bias standard errors and invalidate conclusions (Adam, 1993).

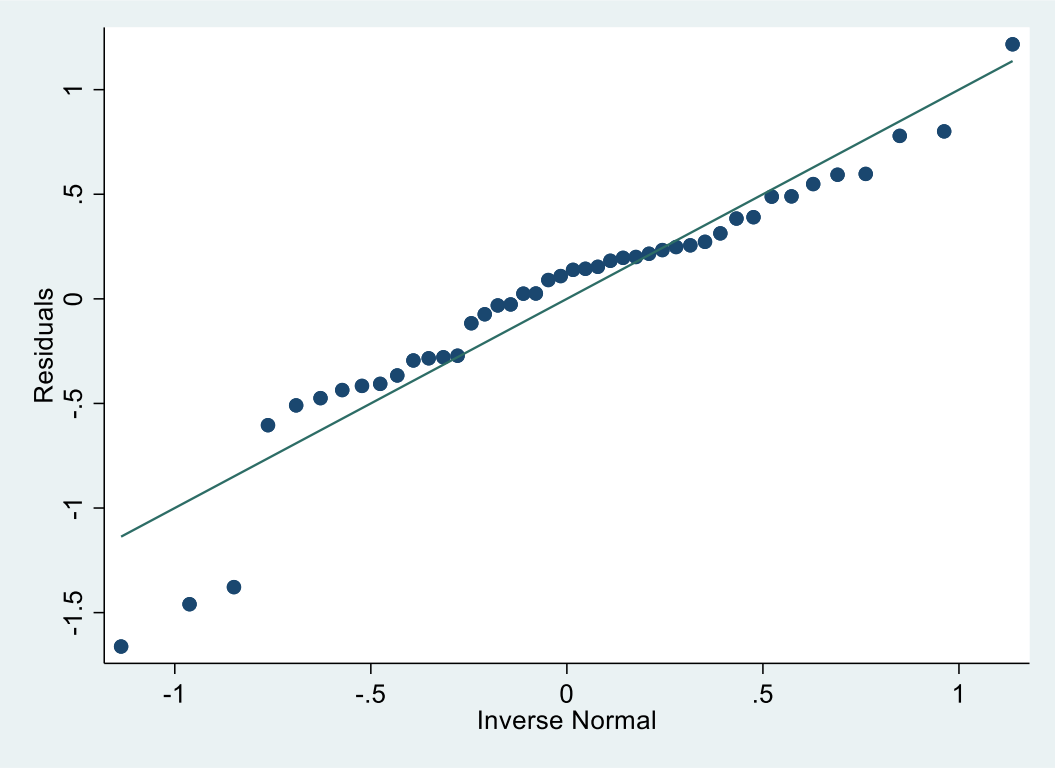

Figure 1: Q-Q Plot of Residuals from the Regression

The Q-Q plot, which compares the distribution of residuals to a theoretical normal distribution, showed that the residuals were closely aligned with the 45-degree reference line, especially in the central range, indicating approximate

normality and thus supporting the validity of statistical inference based on the regression model (Gujarati, 1995).

RESULTS INTERPRETATION

The model was statistically significant at the 5% level (Prob> F = 0.0204), indicating that the set of explanatory variables jointly explains variations in trade performance. The R-squared value of 0.3827 indicates that approximately 38.3% of the variation in trade performance (LogTRADE) is explained by the model, while the adjusted R-squared value of 0.2476 suggests moderate explanatory power. In the short run, the lagged dependent variable (LogTRADE L1) had a positive coefficient of 0.284. It was marginally significant at the 10% level (P = 0.093), indicating that about 28.4% of changes in trade performance persist from one period to the next. This reflects a moderate degree of persistence, where a 1% increase in trade performance in the previous period is associated with a 0.284% increase in the current period, holding other factors constant. The coefficient also suggests a gradual speed of adjustment and is important in computing the long-run effects in a dynamic framework. Regarding domestic debt, the short-run effect is positive but statistically insignificant (0.772, P = 0.157), indicating that immediate changes in domestic borrowing do not substantially influence trade performance. In the long run, the coefficient becomes positive and marginally significant (0.963, P = 0.054), suggesting that a 1% increase in domestic debt is associated with an approximately 0.96% increase in trade performance. For external debt, both short- and long-run coefficients are positive but statistically insignificant (short run: 0.084, P = 0.837; long run: 0.319, P = 0.682). This indicates that borrowing from external sources has not meaningfully translated into increased trade flows in Uganda. Economic activity, proxied by GDP, shows insignificant short-run effects (D0: -0.024, P = 0.974; L1: -0.031, P = 0.964). In the long run, GDP growth is negatively and significantly associated with trade performance (-0.153, P = 0.009). These results indicate that short-term fluctuations in output do not meaningfully affect trade, while long-term growth may not automatically translate into higher trade volumes. The exchange rate exhibits mixed, insignificant short-run effects, but the long-run coefficient is negative and significant (-0.121, P = 0.044). This suggests that immediate exchange rate fluctuations do not substantially influence trade, whereas in the long run, depreciation of the Ugandan shilling reduces trade performance.

DISCUSSION OF RESULTS

The positive long-run effect of domestic debt is consistent with the IS-LM-BP theoretical framework, which predicts that government borrowing, when efficiently used for productive investment, can shift the IS curve to the right, increasing output and trade. Recent empirical studies support this finding by asserting that domestic borrowing in Uganda positively affects infrastructure-led growth, which enhances trade (Ayebare & Kibuuka, 2021), while others highlight that moderate domestic debt can catalyze trade by financing export-oriented projects (Bua & Makori, 2020). The short-run insignificance reflects the time lag required for borrowed funds to be allocated effectively and generate observable impacts on trade performance. Overall, the results imply that sustained domestic borrowing, when efficiently allocated to productive sectors such as infrastructure, logistics, and trade-supporting services, can stimulate trade over time. In contrast, external debt shows no significant effect on trade in either the short or long run, which partially contradicts IS-LM-BP expectations that external borrowing should increase investment, output, and trade. While external borrowing is generally intended to fund long-term development and improve productive capacity, thereby enhancing trade, the absence of a statistically significant effect may reflect delays in disbursement, implementation inefficiencies, or poor project targeting. This challenges theoretical expectations and empirical studies such as Iyoha (1999) and Oyelede et al. (2013), which found external debt to be a potential driver of trade when properly managed. A possible explanation is provided by the debt overhang theory (Krugman, 1988), which argues that high levels of external debt can create uncertainty about future taxes or debt repayment burdens, thereby deterring investment and undermining economic growth and trade. This finding nevertheless aligns with recent African studies (Oduro, Asamoah, & Boateng, 2022; Kimenyi & Moyi, 2019), which emphasize that high debt levels or mismanaged external borrowing can deter private investment and reduce the effectiveness of debt in stimulating trade. Thus, even concessional borrowing from institutions like the World Bank or the IMF may fail to influence trade if debt accumulation is perceived as unsustainable or if the resources are misallocated (IMF, 2024; World Bank, 2021). The negative long-run relationship between GDP and trade performance is somewhat inconsistent with the predictions of the IS-LM-BP framework, which anticipates that higher output should stimulate trade through increased production, investment, innovation, and export potential (Chen, 2024). This suggests that short-run fluctuations in GDP do not significantly affect trade performance over the study period. The finding contradicts conventional economic thinking, which posits that economic growth should drive higher trade volumes, and it also diverges from the results of Frankel & Romer (1999) and Dollar & Kraay (2004), who emphasized the mutually reinforcing relationship between trade and economic growth. Furthermore, the result appears inconsistent with endogenous growth theory (Romer, 1990), which asserts that internal economic growth, particularly through investments in human capital and technology, fosters productivity and international competitiveness. The observed negative effect can be plausibly explained by Uganda's economic structure, where growth is predominantly

concentrated in non-tradeable sectors such as services and subsistence agriculture. While these sectors contribute substantially to domestic output, they have a limited impact on export volumes or competitiveness. According to the Uganda Bureau of Statistics (2023), the services sector, including public administration, education, and informal trade, constitutes over 50% of GDP but contributes minimally to formal merchandise exports (UBOS, 2023). Similar patterns have been documented in Rwanda and Kenya, where rapid growth in services and construction has not consistently translated into corresponding export growth (World Bank, 2020). This finding nevertheless aligns with the Salter-Swan model (Swan, 1956; Karen & Sherman, 2002), which emphasizes that growth concentrated in non-tradeable sectors can improve internal balance without enhancing external trade performance. The result also resonates with recent East African studies (Nyakundi, Wambua, & Mutua, 2021; Nkurunziza & Muvunyi, 2020) showing that GDP growth in non-tradeable sectors does not necessarily boost trade. Consequently, although counterintuitive, these findings underscore the importance of aligning Uganda's economic growth with trade objectives by promoting sectoral diversification and channeling investment toward tradeable sectors, particularly those with export potential, to ensure that economic expansion translates into tangible improvements in trade performance (Hausmann, Hwang, & Rodrik, 2007). Regarding the exchange rate, the normal economic assumption, based on the Marshall-Lerner condition, is that depreciation makes exports cheaper and imports more expensive, thereby improving the trade balance (Leightener, 2024). Yet, this study finds the opposite: a negative long-run effect of depreciation on Uganda's trade performance. This result contradicts prior evidence from developing countries, where depreciation tends to improve trade balances in the long run (Bahmani-Oskooee & Niroomand, 1998). However, it aligns with the J-Curve theory (Magee, 1973), which posits that following a depreciation, the trade balance may initially deteriorate due to pre-existing contracts, delayed price adjustments, and the inelastic nature of import demand. In Uganda's context, the effect is compounded by a structural dependence on imported inputs and consumer goods (UNCTAD, 2021), causing depreciation to raise import costs, fuel inflation, and worsen trade outcomes. Thus, while the finding diverges from standard IS–LM–BP expectations, it is theoretically consistent and contextually justified.

CONCLUSION

Domestic debt positively drives Uganda's long-run trade performance, especially when invested in trade-supporting sectors, while short-run effects are minimal. External debt and GDP growth have a limited impact, reflecting inefficiencies and growth concentrated in non-tradeable sectors. Exchange rate depreciation undermines trade by raising import costs and reducing competitiveness. Overall, domestic debt and exchange rate stability are the primary determinants of Uganda's trade outcomes.

POLICY RECOMMENDATIONS

In light of the study findings, the following policy recommendations are proposed: First, domestic borrowing should be directed toward productive, trade-supportive investments, such as infrastructure and export-oriented projects, with strengthened monitoring to ensure efficiency. Second, policies should promote exchange rate stability and reduce import dependence by incentivizing local production, manufacturing, and value addition, while providing exporters with hedging mechanisms against currency volatility. Third, external borrowing should target projects that increase productive capacity and exports, supported by rigorous project selection, timely disbursement, and strong oversight aligned with national trade priorities. Finally, economic growth should be aligned with trade-oriented sectors through support for agriculture, manufacturing, agro-processing, improved market access, and sectoral diversification to convert growth into higher trade performance.

LIMITATIONS

This study relied on secondary time-series data from 1980 to 2023, which, despite providing a long-term perspective, may suffer from gaps and inconsistencies common in developing countries like Uganda (World Bank, 2020). The analysis focused solely on macroeconomic variables, domestic debt, external debt, exchange rate, economic activity, inflation, and interest rates, excluding other influential factors such as infrastructure, trade policies, regional integration, institutional quality, and global shocks. Additionally, the findings may have limited generalizability beyond Uganda due to its unique economic structure, policy environment, and trade composition.

FUTURE RESEARCH

Future studies could examine the effects of external shocks and regional trade agreements, including global commodity price fluctuations, geopolitical events, and the AfCFTA, on Uganda's trade performance alongside the role of financial market development and access to credit, particularly for SMEs.

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