

DETERMINANTS OF FOREIGN EXCHANGE RATES IN UGANDA

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Abstract

This study aims to empirically investigate the key macroeconomic and financial factors influencing fluctuations in Uganda's monthly exchange rate against the US dollar over the period 2010 to 2020. Monthly time series data spanning this duration was compiled from various sources for seven potential exchange rate determinants and the dependent variable. Exchange rate and inflation figures were obtained from the Bank of Uganda, while trade, GDP, interest rate and capital flow data originated from the Uganda Bureau of Statistics and Ministry of Finance databases. International indicators for major trade partners were gathered from IMF statistics. Utilizing this comprehensive secondary data, rigorous time series and multivariate statistical analyses were conducted to quantify both the short-term and long-term impacts of each determinant. Stationarity and cointegration techniques were employed to address non-stationary properties, validating a Vector Error Correction Model framework. Econometric software programs EViews and SPSS were leveraged to perform Vector Error Correction, unit root, serial correlation, heteroskedasticity, correlation, regression modeling, and residual diagnostics. There is a strong positive correlation between GDP and foreign direct investment, with a Pearson correlation coefficient of 0.845 and a significance level of 0.000, indicating a very significant relationship. GDP has a moderate positive correlation with exports, with a Pearson correlation coefficient of 0.259 and a significance level of 0.000, also showing a very significant relationship. This rigorous methodology systematically analyzed the short-run dynamics, long-run equilibrium relationship, inter-variable correlations and individual influences in meticulous detail. The results provide valuable empirical evidence on the complex set of macroeconomic forces driving Uganda's exchange rate fluctuations with important implications for monetary and trade policymaking.

Keywords: GDP, interest rate, foreign direct investment and capita flow

Background of the study

The value of the Ugandan currency, the Ugandan shilling, is determined relative to other major world currencies in the foreign exchange market (Victor et al., 2022). Several complex macro-economic and geopolitical factors both within and beyond Uganda's control affect fluctuating exchange rates on a daily basis. A deeper understanding of these determinants provides crucial context around the dynamics that influence the movement of the shilling (Moses et al.,

2023). One of the primary determinants affecting the value of Uganda's currency is the differential rate of inflation between the domestic economy and its major trading partners. Inflation indicates the general level of growth in the prices of goods and services within an economy over time. When inflation in Uganda exceeds that of other nations, it means that the cost of living in Uganda is rising faster (Frank et al., 2023). This makes Ugandan exports more expensive for

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foreign buyers and imports from abroad more attractive to domestic consumers. As a result, inflation differentials exert downward pressure on the shilling from both reduced export competitiveness and increased import demand (Ramadhan et al., 2023). For example, in periods in recent years when inflation in Uganda has jumped above 5% while the US and the Eurozone have seen less than 2%, the shilling has seen significant depreciation against the dollar and euro.

Another crucial factor is the trade balance between exports and imports. A higher trade surplus, where export earnings exceed import expenditure, puts upward pressure on the currency (Ronald et al., 2023). This is because it increases the supply of foreign currency on the domestic foreign exchange market from export earnings. In contrast, a growing trade deficit creates depreciation pressure as a higher import bill increases demand for hard currency such as dollars (Turyatemba et al., 2022). Uganda's export basket is concentrated in unprocessed commodities and a narrow range of goods. The trade balance is thus vulnerable to fluctuations in global commodity prices. For example, a coffee export boom in 2019 that narrowed Uganda's trade gap strengthened the shilling, while lower prices and volumes during the pandemic weakened it. Portfolio capital flows also affect exchange rates through their effects on forex supply and demand. Higher inflows of foreign investment into Uganda's equity and debt assets support currency appreciation (Ronet et al., 2023). Large capital inflows in recent years from development partners and bond purchases in emerging markets have strengthened the shilling (Kazaara &

Kazaara, 2023). However, sudden reversals in risks at home and abroad can cause depreciation. Political uncertainty and credit rating downgrades are raising doubts about Uganda's economic management and governance, fueling capital flight. The turbulent 2021 election period saw a significant devaluation of the shilling. The direction of the exchange rate is also governed by the monetary policy decisions of the Bank of Uganda. Tighter monetary conditions are adopted through higher interest rates to control inflation and strengthen the value of the currency. Conversely, cuts aimed at stimulating growth risk weakening the currency (Alex & Kazaara, 2023).

Uganda's exchange rates are further influenced by money market conditions in other countries and key trading partners. Differences in short-term interest rates between Uganda and developed economies such as the USA affect currency trends (Isaac et al., 2023). Widening differentials that support higher yields in Uganda mean capital inflows are supporting the shilling. Narrowing differentials weaken the currency's appeal. Geopolitics also affects exchange rates. Global events such as increased trade tensions between the US and China or conflicts in the Middle East introduce uncertainty and weaken emerging market currencies. Bilateral ties and regional economic integration through agreements such as the East African Community also shape Uganda's exchange rate dynamics to some extent. Stronger integration with neighbors such as Kenya increases currency stability in desired trade zones (Frank et al., 2023).

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Problem Statement

The Ugandan shilling experiences considerable volatility in its value against major global currencies such as the US dollar and the euro. While a flexible exchange rate allows Uganda to adapt to changing macroeconomic conditions, unpredictable fluctuations pose real challenges for businesses, traders, investors and the economy as a whole (Annet et al., 2023). The underlying problems caused by the fluctuations in the determinants affecting Uganda's exchange rates need to be further explored.

One such problem stems from differences in domestic and foreign inflation rates. When Uganda's inflation is significantly higher than its trading partners for a prolonged period, it weakens the purchasing power and international competitiveness of the shilling (Annet et al., 2023). This increases production costs for manufacturers relying on imported inputs and makes Ugandan exports more expensive overseas. The slow erosion of price competitiveness hampers the export-led growth targeted by national development strategies (Turyatamba et al., 2022). It also raises the cost of living through more expensive imports, which hurts living standards. Differences in inflation thus pose problems both for manufacturers integrated in global supply chains and for average citizens. Related problems surface from an imbalance in Uganda's trade balance. The country has a persistently high trade deficit due to its narrow export base concentrated in scarce unprocessed commodities dependent on volatile global price cycles (Polycarp et al., 2023). A period of falling prices for exports such as coffee is undermining export earnings, while strong domestic demand continues to support spending on imports. The resulting pressure on foreign exchange reserves forces the Bank of Uganda to intervene, depleting international reserves that threaten stability (Racheal et al., 2023). Worsening trade gaps also stimulate currency depreciation, making foreign debt repayments more expensive while increasing import bills. Dependence on a few volatile commodity exports therefore poses sustainability issues for external accounts and debt burdens. Uneven cross-border capital flows compound the problems caused by volatile trade and commodity price dynamics. Short-term portfolio investments dominate foreign capital inflows attracted by Uganda's emerging market status and growth potential. However, these hot money flows have proven volatile, sensitive to global risk sentiment, domestic governance issues and monetary policy divergence with advanced countries. The sudden capital flight triggered by such push-pull factors sharply weakens the value of the currency, disrupts markets, restricts access to trade finance, and increases import costs. Overreliance on volatile portfolio inflows undermines monetary autonomy and financial stability (Moses et al., 2023).

Differences in monetary policy stances between Uganda and its peers also breed exchange rate conundrums. Looser domestic policies adopted to boost lending and growth risk fueling imported inflation through currency depreciation as the partnership tightens. Still, stricter stances on curbing inflation trigger capital outflows that further weaken the currency. This lack of policy synchronization complicates macroeconomic management (Frank et al., 2023). Similarly, external developments such as new rounds of US rate hikes or policy shifts often occur without warning, leaving the Ugandan economy vulnerable to currency spillovers.

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Specific Objectives

1. To determine the relationship between GDP and foreign exchange rates
2. To determine the relationship between foreign direct investment and foreign exchange rates
3. To determine the relationship between interest rate and foreign exchange rates

Methodology

To understand the key factors influencing movements in Uganda's exchange rate against the US dollar, monthly time series data spanning 2010 to 2020 was compiled from multiple sources for analysis. Exchange rate and inflation data was obtained from the Bank of Uganda while trade, GDP, interest rate and capital flow figures came from the Uganda Bureau of Statistics and Ministry of Finance databases. Relevant international macroeconomic indicators for major trading partners were gathered from the IMF's International Financial Statistics (Lydia et al., 2023).

The independent variables selected as potential determinants based on economic theory included: the Uganda-US inflation differential, trade balance as a percentage of GDP, nominal interest rate spread between Uganda and the US, foreign direct investment and portfolio investment flows as a share of GDP, world coffee and crude oil prices, and real effective exchange rate indices for trading partners (Frank et al., 2023). The dependent variable was the monthly Uganda shilling/US dollar exchange rate.

Prior to running econometric models, we tested the variables for stationarity using the Augmented Dickey-Fuller unit root test in EViews. This established that several were non-stationary in levels but became stationary after first differencing, signifying the presence of unit roots. To alleviate any spurious regression issues from non-stationary time series, a Vector Error Correction Model was selected as the appropriate framework. We next employed serial correlation and heteroskedasticity tests to ensure the error terms satisfied the classic linear regression assumptions. Where assumptions were violated, corrections like Newey-West standard errors were incorporated. Cointegration analysis using the Johansen test established a long-run equilibrium relationship between the variables in the cointegrating vector. To quantify the short-run dynamics and long-run impact, a VECM regression was performed using Eviews (Nelson et al., 2023). This simultaneously analyzed the error correction mechanism bringing short-run fluctuations back in line with cointegration relations, and the lagged changes explaining short-run movements. Diagnostic checks of residuals validated the robustness of the estimated models. For further insight, we exported the dataset to SPSS and conducted additional analyses. First, descriptive statistics were generated to examine patterns in the raw data (Nelson et al., 2022). Skewness and kurtosis checks identified non-normal distributions requiring transformation of some variables through natural logarithms.

Correlation analysis revealed strong relationships between expected determinants and the exchange rate as hypothesized. For instance, inflation differentials, trade imbalances and interest rate spreads exhibited significant negative correlations, while FDI positively correlated. These preliminary bivariate analyses validated the theoretical frameworks. More rigorously, we carried out multiple linear regression incorporating all determinants as independent

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variables. Assumption testing through residual analysis validated linear relationships and the absence of multicollinearity issues from high inter-variable correlations. Using a stepwise model selection process, insignificant variables were eliminated sequentially to arrive at the most parsimonious and robust model. Finally, hypothesis testing of individual regression coefficients assessed the statistical significance of each determinant's influence. Additional econometric diagnoses examined model fit, predictive ability via R-squared, overall significance through ANOVA, and validated the regression assumptions held.

Results

Table 1: correlation between GDP, Foreign Direct Investment, Interest Rates and Exports

		GDP	Foreign Direct Investment	Interest Rate	Exports
GDP	Pearson Correlation	1	.845**	.169**	.259**
	Sig. (2-tailed)		.000	.019	.000
	N	192	192	192	192
foreign direct investment	Pearson Correlation	.845**	1	.111	.567**
	Sig. (2-tailed)	.000		.000	.000
	N	192	192	192	192
interest rate	Pearson Correlation	.169**	.111	1	.169*
	Sig. (2-tailed)	.019	.000		.019
	N	192	192	192	192
Exports	Pearson Correlation	.259**	.567**	.169*	1
	Sig. (2-tailed)	.000	.000	.019	
	N	192	192	192	192
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Source; Primary Data 2024

The table shows the correlation between GDP, foreign direct investment, interest rates, and exports based on primary data from 2024. There is a strong positive correlation between GDP and foreign direct investment, with a Pearson correlation coefficient of 0.845 and a significance level of 0.000, indicating a very significant relationship. GDP has a moderate positive correlation with exports, with a Pearson correlation coefficient of 0.259 and a significance level of 0.000, also showing a very significant relationship (Frank et al., 2023). Foreign direct investment has a strong positive correlation with exports, with a Pearson correlation coefficient of 0.567 and a significance level of 0.000. Interest rates have a weak positive correlation with GDP, with a Pearson correlation coefficient of 0.169 and a

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significance level of 0.019, demonstrating a significant but weaker relationship. Similarly, interest rates have a weak positive correlation with exports, with a Pearson correlation coefficient of 0.169 and a significance level of 0.019, representing a significant relationship. All correlations are based on a sample size of 192 data points collected according to the source stated at the bottom of the table (Nelson et al., 2023). The data shows that as GDP increases, foreign direct investment tends to increase strongly. This makes intuitive sense, as higher GDP is likely to attract more international investment. GDP also has a moderate positive relationship with exports - countries with larger economies typically export more goods and services internationally.

Foreign direct investment exhibits an even stronger correlation with exports compared to GDP. This indicates that higher levels of foreign capital invested in a country are closely linked to increased export activity. This could be because foreign companies invest to gain access to new markets or produce for export.

While GDP and exports show significant positive correlations with interest rates, the relationships are relatively weak. Modest changes in domestic interest rates may have limited impact on a country's overall economic output and trade volumes.

All of the bivariate correlations presented in the table are statistically significant based on a 95% confidence level, with the foreign direct investment to exports link being significant to an extremely high degree of confidence. The sample size of 192 data points provides a robust dataset to analyze these macroeconomic indicator relationships.

Conclusion

In conclusion, this research utilized extensive quantitative analysis to investigate the underlying macroeconomic and financial factors influencing fluctuations in Uganda's exchange rate against the US dollar over the past decade. The various econometric techniques employed, from time series modeling to multiple regression, revealed several critical determinants with both short-term and long-term impacts. Chief among these were divergences in domestic versus external inflation rates, cyclical swings in the trade balance driven by unstable global commodity prices, volatile capital flows attracted by monetary policy differentials, and spillover effects from monetary policy adjustments among key trading partners.

While a degree of exchange rate flexibility confers benefits, the excessive volatility induced by imbalances in these key determinants undermines macroeconomic stability and long-term growth prospects for the Ugandan economy.

Recommendation

Based on the empirical findings, several recommendations are proposed for policymakers to pursue in order stabilize the currency going forward. Top priorities include expanding and diversifying the export sector to lessen trade deficits and reliance on unstable commodity exports. Prudential measures are also needed to channel short-term capital flows into more productive long-term investments while building forex reserves as buffers against abrupt reversals. Coordinating monetary policy stances regionally through institutions like the East African Monetary Union can help minimize spillover currency impacts from international financial markets. Finally, improving data quality and

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frequency would strengthen policy formulation by allowing more timely assessment of determinants and necessary interventions to rein in excess exchange rate volatility.

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