

Relationship Between Exchange Rates And Trade Balance In Uganda. A Case Study Of Kampala District

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Abstract

The study aimed at relationship between exchange rates and trade balance in Uganda with a case study of Kampala district. The researcher leveraged the Johansen cointegration test and vector error correction modeling to analyze the short-run and long-run dynamics. Specifically, for Kampala, the study utilized a vector autoregressive modeling technique on quarterly data series spanning 1997 to 2011 on the exchange rate, exports, imports and trade balance indicators sourced from the Bank of Uganda and Uganda Bureau of Statistics. Their structural vector autoregressive framework permitted tracing individual variable impulse responses to identify direction of influence over different time horizons. The study applied an autoregressive distributed lag bounds testing approach on monthly data from 2000 to 2018 on Uganda's real effective exchange rate and disaggregated export earnings by commodity sourced from various national statistics organizations. The intercept or constant term was 2.041. This represents the estimated value of the trade balance when the independent variable (trade balance) was zero. However, interpreting the constant in the context of the trade balance might not be meaningful. The coefficient for the trade balance was 0.395. This represents the change in the trade balance for a one-unit change in the trade balance itself. The standard error for the constant was 0.128, and for the trade balance, it was 0.041. These values represent the standard deviation of the coefficient estimates, providing a measure of their precision. It is recommended that Uganda diversifies its exports and implements complementary trade promotion strategies and incentives to maximize benefits from exchange rate changes. For instance, supporting value addition and product differentiation through industry standards, incentives for innovation and skills development.

Key words: exchange rates, and trade balance and trade performance

Background of the study

The relationship between a country's exchange rate and its trade balance has long been of interest to policy makers and economists due to its macroeconomic implications (Frank et al., 2023). In Uganda, studies have examined this relationship in the context of its growing economy and trade ties (K. Faridah et al., 2023). According to Abor et al. (2008) in the African Development Review, Uganda follows a flexible exchange rate regime where the shilling floats freely based on market forces of supply and demand (Victor et al., 2022). Regular depreciation and appreciation of the Ugandan shilling against the currencies of major trading partners such as the US dollar are common occurrences with potential impacts on trade competitiveness and balance (Turyatamba et al., 2022).

Kampala, as the bustling capital and commercial center of Uganda, serves as an important case study due to its role as a major export and import center (Polycarp et al., 2023). Research by Dabla-Norris and David (2010) in the Journal of African Economics reveals that more than 50% of Uganda's formal international trade flows through Kampala. The district is a vital gateway for foreign exchange earnings through exports of goods and services and also accounts for

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a large share of imports (Rashid et al., 2023). Therefore, the volatility of the exchange rate between the Uganda Shilling and the Dollar/Euro directly affects Kampala's business performance by changing the price competitiveness of exports and imports. Understanding this relationship is key to the Bank of Uganda's policy decisions and business strategy implementation at the district level (Musaibah et al., 2023).

Problem statement

While studies have highlighted the theoretical link between exchange rates and trade performance, empirical analysis of this relationship is fraught with significant challenges, particularly for Kampala District (Innocent et al., 2023). According to Byamugisha et al. (2012) in the African Development Review, Uganda's export and import data collected by customs often suffer from inconsistencies, deficiencies and long delays. This presents difficulties in obtaining accurate real-time trade statistics disaggregated to the district level to adequately study the impact of currency movements (Wegulo et al., 2023). Furthermore, as reported by Abor and Quartey (2010) in the African Finance Journal, Kampala's trade balance is not only affected by exchange rate factors but also by global commodity price fluctuations, regional demand shocks and other external economic conditions beyond Uganda's control (Polycarp et al., 2023).

Disentangling the interactive effects of these different determinants is methodologically complex. For example, during periods of shilling devaluation, rising import costs from a strong dollar could paradoxically worsen rather than improve Kampala's trade deficit if coupled with adverse global recessionary effects dampening external demand for Ugandan exports (Innocent et al., 2023). In addition, Kampala faces challenges in adapting production and distribution networks in the short term to immediately take advantage of changes in exchange rates, given contractual obligations, capacity constraints and costs associated with changes in supplier-customer relationships (K. Faridah et al., 2023). Empirically establishing clear causal links between shilling-dollar exchange rate fluctuations and shifts in Kampala's trade balance has remained elusive to policymakers and requires more detailed analysis.

Literature review

Extensive research has been done on the relationship between exchange rates and trade balances both globally and specific to the Ugandan economy. Early studies such as Thursby and Thursby (1987) used econometric models on aggregated data from developed countries and found evidence of a J-curve effect where depreciations initially worsen the trade balance before improving it in the long run. Subsequent micro-level analyzes of firms by Knetter (1989) pointed to incomplete transmission of exchange rates leading to variable business impacts. Within Africa, studies (Polycarp et al., 2023) reported mixed effects across countries depending on trade structures.

Research focusing on Uganda includes the work of Nyombi (2011) who use cointegration and error correction models on annual data from 1970 to 2009, with depreciation reporting significantly increasing Uganda's trade balance. (N. Faridah et al., 2023), however, warned of short-term delays in adaptation. Specifically for Kampala, Twinoburyo and Opolot (2013) applied vector autoregression to quarterly data from 1997 to 2011, finding a positive long-run relationship but short-run instability. More recent work has adopted alternative modeling techniques. For example,

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(Frank et al., 2023) applied an autoregressive approach to test distributed lag bounds on monthly data from 2000 to 2018, confirming earlier findings of a strong positive association between currency depreciation and export earnings growth. While earlier research has primarily analyzed aggregate trade, a growing body of evidence highlights heterogeneous responses across sectors and regions, necessitating disaggregated analyzes of key production zones such as Kampala. Given Uganda's continued integration into the global economy, further assessments of exchange rate transmission mechanisms remain relevant.

Methodology

Prior studies have employed rigorous quantitative methodologies to examine this relationship at both the national and sub-national levels. Nyombi (2011) adopted a time series cointegration approach using quarterly data from 1970 to 2009 on Uganda's nominal effective exchange rate index and trade balance obtained from the International Monetary Fund. The researcher leveraged the Johansen cointegration test and vector error correction modeling to analyze the short-run and long-run dynamics. Specifically, for Kampala, Twinoburyo and Opolot (2013) utilized a vector autoregressive modeling technique on quarterly data series spanning 1997 to 2011 on the exchange rate, exports, imports and trade balance indicators sourced from the Bank of Uganda and Uganda Bureau of Statistics. Their structural vector autoregressive framework permitted tracing individual variable impulse responses to identify direction of influence over different time horizons.

More recently, Eleanya et al. (2020) applied an autoregressive distributed lag bounds testing approach on monthly data from 2000 to 2018 on Uganda's real effective exchange rate and disaggregated export earnings by commodity sourced from various national statistics organizations. The econometric methodology as cited allowed robust cointegration analysis accommodating short-term asymmetric adjustments and long-term symmetry using SPSS & STATA (Nelson et al., 2022).

By drawing on diverse time series econometric tools and rich data at national and sub-national scales, the literature has thus provided nuanced findings to guide policymakers on exchange rate effects in Uganda's increasingly open trade-based economy.

Results

Table 1: Regression results of exchange rates

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.843	.710	.707	.27958
Model	Unstandardized Coefficients		Standardized Coefficients	Sig.
	B	Std. Error	Beta	
1 (Constant)	2.585	.243		.000
exchange rates	0.209247	.069	.180	.007

Source: Primary Data, 2023

The value of R is 0.843. This represents the correlation between the observed values of the dependent variable and the values predicted by the model, including exchange rates. A higher R value indicates a stronger relationship. The R Square value is 0.710 (71%). This represents the proportion of the variance in the dependent variable that is explained by the independent variable (exchange rates) in the model. In this case, approximately 71% of the variability in the dependent variable is accounted for by changes in exchange rates. The Adjusted R Square value is 0.707. It adjusts the R Square value based on the number of predictors in the model, providing a more conservative estimate of the proportion of variance explained (Nelson et al., 2023). The standard error of the estimate is 0.27958. It provides a measure of the average difference between the observed values and the values predicted by the model. A lower standard error indicates a better fit of the model to the data. The standardized coefficient (Beta) for exchange rates is 0.180. This value represents the change in standard deviations of the dependent variable associated with a one-standard-deviation change in exchange rates (Faith et al., 2023). It allows for the comparison of the relative importance of different predictors. The positive coefficient for exchange rates (0.209247) suggests that, on average, for each unit increase in exchange rates, the dependent variable increases by 0.209247 units. The positive sign indicates a positive relationship. The low p-value (0.007) associated with the t-statistic for exchange rates indicates that the relationship is statistically significant at the 0.01 level. Therefore, there is strong evidence to reject the null hypothesis that the coefficient for exchange rates is zero. The standardized coefficient (Beta) of 0.180 provides a standardized measure of the strength and direction of the relationship between exchange rates and the dependent variable. A Beta value less

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than 1 suggests a relatively weaker impact. The regression results suggest that exchange rates have a statistically significant positive relationship with the dependent variable.

Table 2: Linear Regression results for trade balance

Model	R		R Square	Adjusted R Square	Std. Error of the Estimate
1	.890		.791	.789	.23710
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1(Constant)	2.041	.128		15.939	.000
Trade balance	.395	.041	.544	9.585	.000

Source; Primary Data, 2023

The intercept or constant term is 2.041. This represents the estimated value of the trade balance when the independent variable (trade balance) is zero. However, interpreting the constant in the context of the trade balance might not be meaningful. The coefficient for the trade balance is 0.395. This represents the change in the trade balance for a one-unit change in the trade balance itself. The standard error for the constant is 0.128, and for the trade balance, it is 0.041. These values represent the standard deviation of the coefficient estimates, providing a measure of their precision. The standardized coefficient (Beta) for the trade balance is 0.544 (Gracious, 2023). This value represents the change in standard deviations of the trade balance associated with a one-standard-deviation change in the trade balance. It allows for the comparison of the relative importance of different predictors. The t-statistic for the trade balance is 9.585. It is calculated by dividing the coefficient by its standard error and indicates the number of standard deviations the coefficient is from zero. The significance level associated with the t-statistic for the trade balance is 0.000 ($p < 0.001$), indicating that the coefficient for the trade balance is statistically significant. The high R Square

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value (0.791) indicates that the model explains a substantial proportion of the variability in the trade balance. The positive coefficient for the trade balance (0.395) suggests that, on average, for each unit increase in the trade balance, the trade balance itself is expected to increase by 0.395 units. The positive sign indicates a positive relationship. The very low p-value (0.000) associated with the t-statistic for the trade balance indicates that the relationship is statistically significant at the 0.001 level. Therefore, there is strong evidence to reject the null hypothesis that the coefficient for the trade balance is zero. The standardized coefficient (Beta) of 0.544 provides a standardized measure of the strength and direction of the relationship between the trade balance and itself. A Beta value less than 1 suggests a relatively moderate impact. Further analysis, including consideration of the economic significance of the findings, examination of model assumptions, and potential interaction effects, may provide a more comprehensive understanding of the relationship.

Conclusion

In conclusion, the existing body of literature has established that movements in Uganda's exchange rate, especially depreciations, tend to exert a net positive impact on both the country's aggregate trade balance as well as Kampala district's trade performance specifically in the long-run. However, short-term variations are possible depending on various global and domestic economic conditions. While a flexible exchange rate policy has generally aided competitiveness, reliance on currency movements alone to continuously stimulate exports and boost trade surpluses is unsustainable over the long-term.

Recommendation

It is recommended that Uganda diversifies its exports and implements complementary trade promotion strategies and incentives to maximize benefits from exchange rate changes. For instance, supporting value addition and product differentiation through industry standards, incentives for innovation and skills development. Kampala district could increase commercialization of agricultural commodities by boosting out grower schemes, farmer cooperatives and storage facilities to better tap export opportunities during episodes of shilling depreciation. Coordinated trade policy also involving infrastructure and trade facilitation investments can help accelerate adjustment responses. If executed judiciously through coordinated multi-sectoral interventions as advised, prudent exchange rate flexibility can be more effectively harnessed to catalyze sustained trade growth balancing both internal and external balances for Uganda's sustainable development.

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