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THE EFFECT OF EXCHANGE RATE VOLATILITY ON INTERNATIONAL TRADE IN TANZANIA

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ABSTRACT

This study analyses the effect of exchange rates volatility on international trade in Tanzania with a particular emphasis on the export and import, this study was utilized a quantitative design by employed secondary data from World Bank and Bank of Tanzania from 1984 to 2023. The study employed correlation analysis to examine the relationship and Ordinary Least Square (OLS) method with a multiple linear regression model. The study findings revealed that exchange rate has positive significant relationship with exports and positive but statistical insignificant with imports. The result also revealed that inflation has positive insignificant effects in both exports and imports, interest has negative statistical insignificant with exports but statistically significant with imports. The study recommends that policymakers adopt strategies to enhance foreign exchange stability, promote export diversification and construction of own factories to protect against high importations.

KEYWORDS: - Exchange rate volatility, international trade, exports, imports, inflation rate, interest rate and Tanzania.

1.0 INTRODUCTION

International trade involves countries engaging in the buying and selling of goods and services across global borders, plays a vital part in the improvement of the global economy. It necessitates the availability of international currencies, through exchange rates; the exchange rate refers to the value one currency needed to buy or sell another currency. Changes in these rates can have a major influence on trade relations, the worth of investments and the ability to buy goods and services,[1].

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Exchange rates show a critical role in international trade, disturbing a nation's capacity to obtain products and services that are either not available or inadequately produced domestically. These rates designate how much one currency is wealth in relative to another and can be either pegged, managed by governments or central banks, or variable, influenced by market dynamics such as supply and demand. Variable rates typically exhibit larger fluctuations in evaluation to pegged systems, [2].

Over the prior decade, the Tanzanian Shilling has suffered a noticeable depreciation relative to the US Dollar, attributable to both domestic economic policies and global financial adversities. Recently, the TZS has reduced in value, thus escalating the costs of imports for essential products, which are vital for the sustainability of local productions. In contrast, a depreciated Shilling has rendered Tanzanian exports more competitive in the global marketplace by decreasing their dollar-denominated prices, which has the potential to enhance export revenues, [3].

[4], currently Tanzania economy demonstrated strong growth in the second quarter of 2024, achieving a 5.3% increase, up from 4.7% in the same period in 2023. Key sectors driving this growth included trade (19.8%), financial and insurance services (11.4%), and transport and storage (8.6%).In the year concluding in March 2025, Tanzania's goods and services exports experienced a 17.2% increase, totaling USD 16,506.8 million from USD 14,083.2 million while the import of goods and services escalated to USD 17,060.3 million, an increase from USD 16,004.1 million, [5].

Tanzania's economic construction shows a distinct dependence on international trade. However, the fluctuations in currency rates pose a major challenge, creating volatility that influences both exports and imports. The inconsistent changes against major currencies disturb trade stability and secure lasting growth, [4].

The valuation of the Tanzanian shilling has undergone significant fluctuations recently; it experienced a decline of 10.1% for the year concluding in September 2024, followed by an additional decrease of 3.4% for the year ending in March 2025, despite a modest increase observed in February 2025, [5]. This volatility results in higher costs for imported goods and obscures the predicting of export revenues, thus badly affecting Tanzania's trade balance and overall economic stability. Subsequently, given Tanzania's dependence on both imports and exports, the study highlights the imperative to realize the consequences of exchange rate fluctuations on global trade across several sectors.

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2.0 LITERATURE REVIEW

2.1 Purchasing Power Parity

The idea of Purchasing Power Parity is developed by Gustav Cassel in 1918, is based on the idea that the prices of the same goods should be the same no matter where you are in the world. This idea explains how price differences between countries affect how their currencies are valued compared to each other. It posits that the exchange rates of disparate currencies will undergo adjustments such that equivalent goods will be priced identically in all nations when evaluated in a common currency. In Tanzania, changes in currency values have an impact on how well it can compete in trade, how goods are priced, and the stability of its economy. According to PPP, if Tanzania has higher inflation than its trading partners, the Tanzanian shilling (TZS) should become weaker to balance out prices, [6].

2.2 Interest Power Parity

The Interest Rate Parity idea was developed by John Maynard Keynes in the year 1923. This theory explains the connection between interest rates and exchange rates, suggesting that differences in interest rates influence expected currency shifts to get rid of any arbitrage opportunities. In Tanzania, shifts in exchange rates, caused by things such as inflation and changes in worldwide interest rates, greatly affect capital movement, investment decisions, and trade competition. High domestic interest rates attract foreign investments, which helps keep the national currency stable, while low rates can cause capital to leave the country and the currency to lose value.

2.3 Balance of Payment Theory (BoP)

This theory introduced by John Maynard Keynes in 1936 as part of his broader discussion on employment, interest, and money, explains how a country's foreign economic activities affect changes in exchange rates and its trading efficiency. A BoP surplus brings about a growth in the worth of a currency, which consequently may negatively impact export competitiveness, whereas a BoP shortfall results in a decrease in currency worth, escalating import costs. Within Tanzania, the inconsistency of the exchange rate, triggered by external aspects, trade differences, and changes in foreign investment, noticeably influences trade efficiency, inflation amounts, and investor confidence. The BoP acts as a self-correcting system; a currency depreciation resulting from a shortfall could render exports more affordable and imports more costly, thereby aiding in balancing trade differences.

2.4 Empirical Review

[2], investigate how exchange rates affect international trade in Tanzania, utilizing data spanning from 1990 to 2020. Employed the Ordinary Least Squares (OLS) regression, their results reveal a considerable and favorable correlation connecting exchange rates and exports. Conversely, the

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interest rate demonstrated a negative yet significant connection with exports, whereas the inflation rate showed a positive but insignificant association with exports. In another study by [7], which analyzed the effect of exchange rates, inflation rates, interest rates, and economic expansion on agricultural export profits in Tanzania between 1990 and 2019, the outcomes differed. Employing multiple linear regressions, the study decided that the exchange rate experienced an insignificant impact on agricultural export profits, while both inflation and interest rates significantly and favorably impacted export results.

As per the examination conducted by [8], which explored the effects of currency fluctuations on Tanzania's international trade over the years 1995 to 2021, it was determined that instability in exchange rates adversely influences both export and import activities. Furthermore, the outcomes indicated that the nation's inflation rate adversely impacts international trade in Tanzania. Conversely, research by [9], which scrutinized the relationship between exchange rate fluctuations and foreign trade in Asian nations, identified a slight negative relationship between exchange rate variability and the amounts of both exports and imports.

Another investigation regarding the effect of exchange rate volatility on international trade in China, utilizing monthly records from January 2003 to August 2018, exposed substantial insights through time series examination. The outcomes demonstrated a co-integration relationship among the variables, with the error correction model revealing a significant positive correlation between exchange rates and export levels, while inflation showed a marked negative correlation with exports, but exchange rate fluctuations and inflation significantly negatively affect imports, [10].

A different investigation by [11], regarding how fluctuations in exchange rates affect Malaysia's export success reveals that such volatility has an adverse effect on the nation’s exports. The study highlights that consistent exchange rates are crucial for promoting export advancement and strengthening economic stability.

[12], a study observed at how exchange rates affect Tanzania's agricultural exports using data from the World Bank from 1997 to 2017. The study used the multiple linear regressions with the OLS method. The data indicated that shifts in currency values and exports of agricultural goods share an inverse relationship. This means that unstable exchange rates hurt the agricultural sector. The study emphasizes that Tanzania needs steady exchange rate policies to help its agriculture sector grow, as it is important for jobs and economic improvement.

[13], carried out a study examining how changes in currency rates influence trade in West Africa. The results revealed that instability in exchange rates does not significantly detract from

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exports, it has a prominent and beneficial impact on the trade balance, suggesting that export activity increases during times of fluctuation. On other side the study revealed insignificant effect on imports.

[14] examined how the exchange rates affected Nigeria's imports and exports from 1996 to 2015, by using a Vector Auto Regression (VAR) model. It was found that exchange rates increased imports, but this increase was not statistically significant.

[15], A study investigates the data from 2014 to 2023 to see how changes in exchange rates affected Tanzania's economy, using correlation and regression analysis. The results showed a strong link between exchange rates and the trade balance. This suggests that when exchange rates change a lot, it hurts trade. The study indicates that Tanzania needs to maintain sufficient foreign exchange reserves to stabilize its currency and support its economy.

3.0 METHODOLOGY

The study was employed secondary annual information spanning 40 years, from 1984 to 2023, obtained from the World Bank Development Indicators and the Bank of Tanzania. Covering forty years, this extensive data set enables a thorough investigation into the long-term consequences. The study was utilized a quantitative approach and non-experimental design, chosen for its superior capability in examining numerical data and producing impartial and widely applicable conclusions,[16]. Multiple linear regression model was employed, a diagnostic test was checked to make sure the variables free from the violation of regression assumptions.

After considering the regression violation assumptions, the following regression models were specified to account for dynamic effects:

$LEXP_t = \beta_o + \beta_1 LEXCH_t + \beta_2 LINFL_t + \beta_3 LINTR_t + \beta_4 LEXP(-1) + \varepsilon$ …. (1)

$LIMP_t = \beta_o + \beta_1 LEXCH_t + \beta_2 LINFL_t + \beta_3 LINTR_t + \beta_4 LEXP(-1) + \varepsilon$ ….. (2)

$LEXP_t$ = Natural logarithm of exports at time t

$LIMP_t$ = Natural logarithm of imports at time t

$LEXCH_t$ = Natural logarithm of exchange rate (TZS/USD) at time t

$LINFL_t$ = Natural logarithm of inflation rate (%) at time t

$LINTR_t$ = Natural logarithm of interest rate (%) at time t

LEXP(-1), LIMP(-1) = One-period lagged dependent variables

t = Time period in years

ε = Error term

β_o, β_1, β_2, β_3 and β_4 = Estimated parameters in a model

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4.0 FINDING AND DISCUSSION

4.1 Descriptive Statistics

Table 4.1 below presents a summary of descriptive statistics for the variables observed in this study.

Table 4.1: Descriptive Statistics

	EXPORTS	IMPORTS	EXCHANGE...	INFLATION_RATE	INTEREST_...
Mean	4258.967	5867.663	1120.168	14.47506	19.36597
Median	2391.938	3058.357	1053.290	7.873500	16.34500
Maximum	13982.48	16674.12	2501.445	36.31579	35.95000
Minimum	393.2129	935.0488	12.46000	3.291074	10.01000
Std. Dev.	3917.185	4861.927	790.2613	11.55948	6.389565
Skewness	0.684949	0.671218	0.251891	0.725225	1.234913
Kurtosis	2.192387	2.073496	1.825717	1.910992	3.546729
Jarque-Bera	4.214763	4.434239	2.721228	5.482909	10.66493
Probability	0.121556	0.108922	0.256503	0.064476	0.004832
Sum	170358.7	234706.5	44806.72	579.0024	774.6387
Sum Sq. Dev.	5.98E+08	9.22E+08	24356006	5211.238	1592.235
Observations	40	40	40	40	40

Source: *Researcher findings, 2025*

Exports disclosed an average value of USD 4,258.97 million over the study period, attainment a peak of USD 13,982.44 million and a minimum of USD 393.21 million. With a standard deviation of USD 3,917.19 million, the export presentation exposed extensive changes over the years. Similarly, imports had an average value of USD 5,867.66 million, with a maximum of USD 16,674.12 million and a minimum of USD 935.05 million, indicating more pronounced variations as evidenced by the standard deviation of USD 4,861.93 million.

The exchange rate (TZS/USD) had a mean value of 1,120.17, indicating a consistent decline in value during the period under study. Its values varied from a low of 12.46 to a high of 2,501.45, with a standard deviation of 790.26, highlighting considerable instability in the exchange rate. According to the Jarque-Bera test statistics for all the variables, exports, imports, inflation, and the exchange rate follow a normal distribution, as the p-values were greater than 0.05, implying that the null hypothesis of normality cannot be rejected. However, the interest rate ($p = 0.0048$) showed a considerable departure from normality, implying that the econometric model might need to be transformed.

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4.2 Correlation Analysis

The toughest correlation coefficients are seen between the exchange rate and export, as well as between the exchange rate and import, showing positive relationship coefficients of 85.13% and 81.74%, respectively. This exposes that the variables under investigation display strong correlation coefficients, signifying that a growth in one variable is connected with an equivalent growth in the other.

Table 4.2: Correlation Analysis

Correlation	LEXPORTS	LIMPORTS	LEXCHANG...	LINFLATION...	LINTEREST...
LEXPORTS	1.000000				
LIMPORTS	0.980993	1.000000			
LEXCHANGE_RATE	0.851258	0.817437	1.000000		
LINFLATION_RATE	-0.815307	-0.734094	-0.797197	1.000000	
LINTEREST_RATE	-0.403840	-0.380792	0.002622	0.411453	1.000000

Source: *Researcher findings, 2025*

4.3 Regression Analysis

This section explains the results from the regression models employed to evaluate the impact of exchange rate volatility on Tanzania's international trade. The objectives of this analysis were first, to examine the effect of exchange rate fluctuations on the exports in Tanzania and second to examine the effect of exchange rate volatility on the imports in Tanzania.

4.3.1 Relationship between Exchange Rate and Exports

The coefficient of determination (R-squared) originates at 0.9911, display that around 99.11% of the changes in exports are explained by the dependent variables, while the remaining 0.89% is not explained by the model. The F-statistic, which is 941.80 with a p-value of 0.0000, tells us that the entire model is overall statistically meaningful.

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Table 4.3: Regression Analysis of Exchange Rate and Exports

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.318408	0.432131	0.736834	0.4663
LEXCHANGE_RATE	0.118019	0.046723	2.525928	0.0164
LINFLATION_RATE	0.038309	0.052042	0.736121	0.4667
LINTEREST_RATE	-0.108293	0.125898	-0.860170	0.3957
LEXPORTS(-1)	0.898931	0.046208	19.45392	0.0000

R-squared	0.991056	Mean dependent var	7.830585
Adjusted R-squared	0.990004	S.D. dependent var	1.164217
S.E. of regression	0.116398	Akaike info criterion	-1.344402
Sum squared resid	0.460645	Schwarz criterion	-1.131125
Log likelihood	31.21584	Hannan-Quinn criter.	-1.267880
F-statistic	941.8950	Durbin-Watson stat	1.860848
Prob(F-statistic)	0.000000		

Source: *Researcher findings, 2025*

The exchange rate exerts a positive and statistically significant influence on exports, with a coefficient of 0.118 and a p-value of 0.0164; this outcome substantiates the hypothesis that exchange rate volatility considerably impacts exports. This result implies that a depreciation of the Tanzanian shilling correlates with an augmentation in exports, likely attributable to enhanced price competitiveness of Tanzanian commodities in global markets. Additionally, the inflation rate has a positive relationship with exports, but it is not statistically significant. In contrast, the interest rate exhibits a negative and statistically insignificant effect on exports. The regression violation test checked confirmed the model did not suffer against any problem.

The above finding indicates that when the value of the Tanzanian shilling goes down, it helps the country sell more goods abroad because Tanzanian products become more affordable in the international marketplace. Such a conclusion is congruent with the theoretical framework posited by the Purchasing Power Parity (PPP) theory, which contends that adjustments in exchange rates serve to equalize price levels across nations and bolster the competitive stance of goods originating from economies with weaker currencies. The results of this study validate the findings of [1-3], identified a positive and significant correlation between exchange rate fluctuations and exports, thereby reinforcing the assertion that depreciation fosters enhanced trade performance in developing economies. But conversely with the findings of;[8] and [11-12], indicated that exchange rate volatility adversely impacts exports.

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4.3.2 Relationship between Exchange Rate and Imports

The R-squared value is 0.9792, indicating that 97.92% of the variability in import levels is accounted for by the dependent variables. The model's comprehensive statistical relevance is supported by the F-statistic of 399.19, along with its probability value of 0.0000.

Table 4.4: Regression Analysis of Exchange Rate and Imports

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.157297	0.513910	2.251946	0.0309
LEXCHANGE_RATE	0.093138	0.054308	1.714994	0.0954
LINFLATION_RATE	0.077195	0.065615	1.176481	0.2476
LINTEREST_RATE	-0.310924	0.142794	-2.177424	0.0365
LIMPORTS(-1)	0.882996	0.057452	15.36938	0.0000

R-squared	0.979151	Mean dependent var	8.322788
Adjusted R-squared	0.976698	S.D. dependent var	0.911603
S.E. of regression	0.139155	Akaike info criterion	-0.987242
Sum squared resid	0.658384	Schwarz criterion	-0.773964
Log likelihood	24.25121	Hannan-Quinn criter.	-0.910720
F-statistic	399.1944	Durbin-Watson stat	1.923655
Prob(F-statistic)	0.000000		

Source: *Researcher findings, 2025*

The exchange rate reveals a positive statistical insignificant effect on imports, it has a coefficient of 0.093 and a p-value of 0.095, indicating that an increase in the exchange rate has a satisfactory effect on imports. The inflation rate further reveals a positive and statistically insignificant association with imports. The interest rate is negatively correlated with imports is statistically significant. The regression violation test checked confirmed the model did not suffer against any problem.

The above finding is consistent with the conclusions drawn by [9] and [13 -14], who similarly reported that exchange rate volatility exerted minimal or no significant effect on imports. On other side the results contrast with [8] and [10] observed that exchange rate volatility adversely influences imports in both Tanzania and China.

5.0 CONCLUSION

The purpose of this study was to analyze the effect of exchange rate volatility on international trade in Tanzania, between 1984 and 2023. Employed secondary data sourced from the vaults of the Bank of Tanzania and the World Bank, multiple linear regression analysis was deployed to establish the relationships between exchange rate volatility, inflation, interest rates, exports, and imports. The results revealed that exchange rate volatility has a positive and statistically

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significant effect on exports, pointing towards a scenario where the devaluation of Tanzania's currency bolsters the attractiveness of its products on the international market. On other side, fluctuating exchange rates demonstrated a positive statistically insignificant effect on imports, implying that, irrespective of heightened expenses tied to currency depreciation, the appetite for imports perseveres undeterred, largely because of Tanzania's reliance on overseas merchandise. Inflation, it was discovered, exerts no significant influence over both exports and imports, whereas interest rates displayed a negative and significant effect over imports, but negative and statistical insignificant effect over exports. Integrity checks authenticated the soundness, consistency, and dependability of the statistical models utilized.

6.0 RECOMMENDATIONS

Based on what the study revealed, a few courses of action are advised. The government of Tanzania advised to ensure its exports more competitive by growing the kinds of things it sells other than just the traditional things like coffee, tea, and valuable rocks. This plan will cut down on being too dependent on basic items and make the economy stronger when outside problems occur. Also, the government and the Bank of Tanzania should come up with rules to keep the exchange rate steady, which will make things less unsure for sellers. This could mean keeping enough foreign money on hand and pushing ways to protect against risk like agreements for future deals and trading one currency for another to lessen the dangers from changes in the exchange rate. Furthermore, Tanzania needs to work on not relying so much on things from other countries by growing its own factories, supporting making important items locally, and setting up rules that help replace things that are imported. Finally, subsequent study should take into account additional macroeconomic variable of political instability and analyze the effect of exchange rate on gold exports, manufacturing, and tourism would yield more profound insights into the varying impacts on international trade in Tanzania.

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