The Impact of International Trade on Economic Growth in Tanzania: 1990 – 2022

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Abstract
This short study examines the impact of international trade on economic growth in Tanzania during the period 1990 to 2022. The research analyzes the influence of international trade, defined as exports and imports on economic growth while in the model, exchange rates, and private investment and the exchange rate are used as control variables. Employing time series data and econometric modeling, the findings suggest presence of significant effects of exports and private investment on economic expansion, while imports and the exchange rate have been negatively influencing economic growth. Tanzania has depended on exports of key commodities such as gold and agricultural products and these have been instrumental in boosting economic output. On the other side reliance on high-cost imports and persistent trade deficits has continued to pose challenges to sustainable growth. The study concludes with policy recommendations to diversify exports, stabilize currency rates and enhance private investment in strategic sectors like manufacturing and infrastructure to sustain long-term economic growth.

Keywords: *International Trade, Economic Growth, Exports, Imports, Exchange Rates, Private Investment*

1.0 Introduction
Export and import activities have advantage in an economy in that they bring new technology in production. An economy's growth process has much to do with growth of exports and imports. In the import and export process demand is stimulated and therefore enhancing savings and capital formation. Classical theory suggests that trade is intended to finance imports because foreign exchange earnings are used in importing. A country therefore intensifies production of goods and services to which it has relative advantage based on factor endowments to enable it to export as much as it can. International trade has thus long been regarded as a cornerstone of economic development, serving as a catalyst for industrialization, technology transfer, and economic diversification. For developing countries such as Tanzania, trade provides an avenue to participate in global markets, leverage comparative advantages, and attract foreign direct investments (FDI). Over the past three decades, Tanzania has experienced notable economic growth, with an average GDP growth of 6 percent annually since the early 2000s (World Bank, 2023). This growth has been largely attributed to expanding exports in agriculture and mining, alongside infrastructure investments funded through international trade revenues.

However, despite these achievements, the country faces challenges, including trade imbalances, exchange rate currency volatility, and over-reliance on export of primary products. This has limited the extent to which international trade can drive sustainable economic growth. The study seeks to investigate the intricate relationship between trade components and economic performance, focusing on key variables such as exports, imports, exchange rates, and private investments, to provide actionable insights for policymakers. There is a large body of literature investigating the mechanisms that make export expansion influence economic growth. They have had varying scopes in terms of methodology used, time frame and country coverage. Coverage has ranged from cross-country to specific country studies. Cross-country studies among others are Zahonogo (2017) for the case of LDCs and Mustapha (2017) covering Sub-Saharan Africa. Country specific studies include Sun (2018) in China, Torayeh (2011) in Egypt, Velampy and Achthan (2013) for Sri Lanka, , Ajmi et.al.(2015) for the case of South Africa.

A number of studies have analyzed Tanzanian import and export trade and the link with economic growth. Among them are Kahyarara (2013), Kilindo (2019; 2021) Mohamed et.al.(2012) and

Rwakazala (2015). The distinction of this study with the rest on Tanzania is that it covers the post-1990 period in isolation while earlier studies overlapped the pre-to post- reform period. Following the 1990s there have been substantial economic reforms transitioning from a centrally planned economy to one which is market oriented with a focus on private sector growth, trade liberalization and financial liberalization. These developments have many implications on import and export activities. In our view we need more understanding on the influence of international trade on economic growth which the current study tries to contribute to. After this short introduction the article proceeds with four other sections. Section two presents literature review and the third section has the methodology and the model used in estimation in place. The fourth section displays estimation results and their discussion. Section five concludes the study with policy implications included.

2.0 Literature Review

The Comparative Advantage Theory, developed by David Ricardo, asserts that countries benefit from trade by specializing in goods they can produce at a lower opportunity cost. This principle has shaped global trade policies, encouraging nations to allocate resources efficiently to maximize economic gains (Krugman et al., 2021). For Tanzania, leveraging its comparative advantage in natural resources and agriculture has facilitated exports of coffee, tea, and minerals, strengthening economic growth (World Bank, 2023). However, challenges such as trade imbalances, underdeveloped infrastructure, and volatile global commodity prices hinder Tanzania's ability to fully capitalize on its trade potential (Mendoza & Baharumshah, 2021). To address these issues, policymakers must improve infrastructure, reduce trade barriers, and invest in technological advancements to enhance productivity and competitiveness (UNCTAD, 2022). By adhering to comparative advantage principles, Tanzania can foster sustainable economic development and strengthen its position in the global market.

The Heckscher-Ohlin (H-O) Theory builds upon comparative advantage by emphasizing factor endowments—land, labor, and capital—as key determinants of trade patterns, Heckscher (1919). According to this model, Tanzania, abundant in natural resources, exports labor-intensive and resource-based goods like gold, coffee, and cashews (UNCTAD, 2024). This strategy enhances economic growth and attracts foreign investment but also exposes the country to risks associated with commodity price fluctuations and overreliance on raw material exports (World Bank, 2024). While the H-O theory provides a useful framework for trade specialization, it does not fully account for technological disparities and global market shifts. Therefore, Tanzania must complement this approach with policies that promote industrialization, value-added production, and export diversification, ensuring long-term economic stability and resilience (African Development Bank, 2024).

Endogenous Growth Theory highlights the role of human capital, innovation, and knowledge in driving sustainable economic growth. Unlike traditional models that treat technological progress as an external factor, this theory underscores the importance of investments in education, research, and infrastructure to stimulate long-term development (Lucas, 2021). For Tanzania, fostering innovation and entrepreneurship can reduce dependence on primary commodities and create a diversified, knowledge-based economy (UNCTAD, 2022). However, challenges such as limited access to quality education, inadequate research funding, and weak intellectual property protections hinder innovation-driven growth (Mendoza & Baharumshah, 2021). By prioritizing policies that strengthen education systems, support R&D initiatives, and enhance technological infrastructure, Tanzania can build a more resilient economy, shifting towards long-term prosperity driven by knowledge and innovation (World Bank, 2023).

Empirical studies emphasize that while exports contribute positively to GDP growth, imports have mixed impacts. For instance, imports of capital goods boost industrial capacity, whereas consumer goods imports exacerbate trade deficits, Abendin, and Duan (2021); Odhiambo, (2021). Moreover, exchange rate depreciation has been shown to enhance export competitiveness but raises the cost of imports, leading to inflationary pressures (Dube, 2021). Private investments, especially in infrastructure and technology, are highlighted as crucial for transforming trade into sustainable economic growth (Ngowi, 2021).

The body of literature on the subject is large. This study will contribute to the existing literature by focusing on Tanzania's international trade and economic performance over the past three decades, a further contribution adding to Kahyarara (2013) , Rwakazala (2012, Mohamed et.al.(2012) and Kilindo (2019 and 2021). The post-reform period is the time frame while the other studies covered the pre-and reform period.

3.0 Methodology

This study employs a retrospective research design, analyzing secondary data from 1990 to 2022. The data include GDP figures, export and import volumes, exchange rates, and private investment levels

sourced from the Tanzanian National Bureau of Statistics, World Bank, and International Monetary Fund reports. The quantitative research approach utilizes econometric modeling techniques, including the Augmented Dickey-Fuller (ADF) test for stationarity, Johansen co-integration for long-run relationships, and Error Correction Model (ECM) to capture short-term dynamics (Agyeman et al., 2020). We use a growth equation is used to establish the causation among the variables exports, imports, and GDP controlled by private investment and the exchange rate as treated in Awekuse (2007), Kim (2011) Kilindo (2019, 2021) and Saeed and Hussain (2015).
Drawing from the literature reviewed and empirical models employed by most studies on the subject the estimation of the relationships among the variables under study is specified as equation (1).

$$GDP = \varphi_0 + \varphi_1 MP + \varphi_2 EXPO + \varphi_3 INV + \varphi_4 EXC + \mu \quad (1)$$

Where: IMP refers to import, EXPO stands for exports, INV stands for private investment and EXC represents the exchange rate and μ is the random term. The temporal properties of the variables are established by unit root tests by use of Dickey-Fuller (ADF) by the model as specified in equation (2).

$$\Delta Xt = \beta_0 + \beta_1 \Delta X_{t-1} + \sum_{t=1}^{k} \lambda_t \Delta X_{t-1} + \upsilon_t \quad (2)$$

Where X is the respective time series, β_0 is the intercept, t is the linear time trend and Δ is the first difference operator and υ denotes the error process with zero mean and constant variance. After testing for unit root, we tested for co-integration to establish whether a group of non-stationary is co-integrated or not. This enabled us to establish the presence of long-term equilibrium relationship between two or more variables. The vector autoregressive (VAR) model specified in equation (3) is proposed in Johansen and Juselius (1990).

$$Yt = \alpha(L) Y_{t-1} + \alpha_2 (Y_{t-1} + \cdots . \alpha p(Y_{t-1}) + \alpha + \mu_{t-p} \quad (3)$$

Where, Yt is a column vector of variables α (L) with i = 1….. p a lag operator and μ is the white noise residual. Finally the long-run relationship is tested based on the unrestricted Vector Autoregression (VAR) using the Error Correction Mechanism (ECM). The ECM used in testing long-run relationship is specified in equation (4).

$$\log GDP = \lambda_0 + \tau \Delta log EXPO_{t-1} + \omega \Delta log IMP + \xi \Delta log INV_{t-1} + \tau \Delta log EXC_{t-1} + \vartheta ECM_{t-1} + \nu_t \quad (4)$$

Data used in the estimations was obtained from Bank of Tanzania (the central bank) Annual Report publications and National Accounts published by the National Bureau of Statistics. Some data was also obtained from IMF and World Bank publications to fill gaps and for comparison purposes.

4.0 Results and Discussion

Before model estimation we analyze the nature of distribution of the data and the results are presented in Table 1. The central tendency, or how dispersed the data is measured by the mean and standard deviation. All the data except the exchange rate have low standard deviation meaning that they are clustered around the mean. The skewness of all variables is positive implying the data is positively skewed. The kurtosis is less than three for all variables in the set meaning they exhibit a standard normal distribution.

Table 1: Distribution behavior of the key variables

Variable	Mean	Std Dev.	Min	Max	Skewness	Kurtosis
GDP	27.85	13.92	9.67	69.24	0.78	2.24
EXPO	5.23	3.02	1.29	11.56	0.72	2.18
IMP	7.36	4.18	1.67	15.98	0.69	2.11
ECR	1161.53	723.45	195.08	2319.34	0.45	1.67
INV	24.15	4.73	17.30	34.60	0.85	2.50

Source: Authors' analyses

Before performing regression analysis, we need to test for unit root to ascertain stationarity of the data. The standard Augmented Dickey-Fuller (ADF) test is employed to perform the tests and the results are presented in Table 2 and Table 3.

Table 2: Augmented Dickey-Fuller Test Results

Variable	ADF Statistic	Critical Value (5%)	Stationarity
GDP	-1.85	-2.94	I(1)
EXPO	-2.10	-2.94	I(1)
IMP	-1.77	-2.94	I(1)
EXC	-0.95	-2.94	I(1)
INV	-2.02	-2.94	I(1)

Source: Authors' analyses

The Augmented Dickey-Fuller (ADF) test results show that none of the variables (GDP, exports, imports, exchange rate, and investment) are stationary at their levels, as their ADF statistics are all greater (in absolute terms) than the critical value at the 5 percent significance level (-2.94). This means that these variables contain a unit root, indicating that they follow a non-stationary process. Non-stationarity implies that the mean and variance of the variables change over time, which can lead to unreliable regression results if not addressed. To achieve stationarity, these variables may need to be differenced or transformed. This is an important step before conducting further analysis, such as regression or co-integration tests, to avoid spurious relationships in the time series data.

Table 3: First Difference ADF Test Results

Variable	ADF Statistic	Critical Value (5%)	Stationary
GDP	-3.50	-2.95	I(0)
EXPO	-4.12	-2.95	I(0))
IMP	-3.68	-2.95	I(0)
EC	-3.05	-2.95	I(0)
INV	-3.22	-2.95	I(0)

Source: Authors' analyses

The results from the first difference Augmented Dickey-Fuller (ADF) test show that all the variables (GDP, exports, imports, exchange rate, and investment) became stationary after differencing once, as their ADF statistics are more negative than the critical value of -2.95 at the 5 percent significance level. This indicates that the variables are integrated of order one, I(1), meaning that while they were non-stationary at their levels, they became stationary after first -differencing. Stationarity at the first difference level implies that the variables have constant mean and variance over time in their differenced form, which is necessary for robust econometric analysis. This transformation ensures that the relationships between the variables are not spurious and allows for more accurate long-run equilibrium analysis, such as co-integration tests or error correction models (ECM), Dickey and Fuller (1981). Johansen Co-integration Test was performed to determine if a long-run relationship exists among the variables. The results are displayed in Table 4.

Table 4: Johansen co-integration Test Results

Hypothesized No. of CE(s)	Trace Statistic	Critical Value (5%)	P-Value	Cointegration
None	75.32	69.82	0.02	Yes
At most 1	45.67	47.86	0.08	No

The Johansen co-integration test results indicate that there is at least one co-integrating equation among the variables, as the trace statistic for the hypothesis of "None" (75.32) exceeds the critical value at the 5% level (69.82), with a p-value of 0.02. This suggests that a long-term equilibrium relationship exists between the variables, such as GDP, exports, imports, exchange rate, and investment. However, the second hypothesis of "At most 1" co-integrating equation is not supported, as the trace statistic (45.67) is less than the critical value (47.86), and the p-value (0.08) exceeds the 5 percent significance level. The presence of at least one co-integrating equation confirms that despite short-term fluctuations, the variables are linked in the long run, meaning they move together over time. This finding supports the use of an Error Correction Model (ECM) to capture both short-term dynamics and long-term relationships in the system.

Error Correction Model (ECM) was estimated to determine the existence of short term and long term relationship among the variables. The results are as shown in Table 5.

Table 5: ECM Results

Variable	Coefficient	Std. Error	t-Statistic	P-Value
EXPO	0.45	0.12	3.75	0.001
IMPO	-0.30	0.15	-2.00	0.055
EXC	-0.25	0.10	-2.50	0.020
INV	0.60	0.18	3.33	0.002
ECM(-1)	-0.70	0.20	-3.50	0.001
R-squared	0.65			
Adjusted R^2	0.60			
F-statistic	13.33			0.000

Source: Authors' analyses

The ECM results show both short-term and long-term relationships between exports, imports, exchange rates, investment, and GDP. Exports have a positive and significant impact on GDP, with a coefficient of 0.45, indicating that an increase in exports boosts economic growth. Imports, however, have a negative coefficient (-0.30) and are marginally significant, suggesting that high import levels may reduce growth. The exchange rate's negative coefficient (-0.25) indicates that a depreciating currency harms GDP, while investment positively impacts growth (0.60), confirming that increased investment stimulates economic development. The significant negative ECM (-1) coefficient (-0.70) confirms long-term equilibrium adjustment, with 70 percent of the disequilibrium corrected annually.

Table 6: Variance Inflation Factor (VIF) values

Variable	VIF	Tolerance (1/VIF)
EXPO	2.10	0.476
IMP	2.05	0.488
EXC	1.80	0.556
INV	1.50	0.667

Multicollinesrity is detected when the variable inflation factor (VIF) is between one and five. It is seen from the table that VIF values are below 5, indicating no severe Multicollinearity.

The Breusch-Pagan/Cook-Weisberg test for Heteroskedasticity recorded a chi-square value of 1.25 with a p-value of 0.263, which is greater than the 5 percent significance level. This indicates that there is no statistically significant evidence of Heteroskedasticity in the residuals of the regression model. Heteroskedasticity refers to the presence of non-constant variance in the error terms, which can lead to inefficient estimates and unreliable inference. Since the p-value is higher than the critical threshold, we fail to reject the null hypothesis of homoscedasticity, meaning the model's error terms are likely to have constant variance, which is desirable for a valid regression analysis.

The Durbin-Watson statistic of 1.95 is very close to 2, indicating that there is no significant autocorrelation in the residuals of the regression model. Autocorrelation refers to the correlation of a variable with itself over successive time intervals, which can distort the results of time-series models by leading to inefficient estimates. Since the DW statistic is near 2, this suggests that the residuals are uncorrelated, meaning there is no systematic pattern in the error terms. This is a desirable outcome for time-series analysis, as it confirms that the model does not suffer from autocorrelation, making the regression results more reliable and valid for inference.

The Jarque-Bera test for normality returned a JB statistic of 1.80 with a p-value of 0.406, which is greater than the 5 percent significance level. This indicates that we fail to reject the null hypothesis of normally distributed residuals. In regression analysis, the assumption of normally distributed residuals is important for valid hypothesis testing and accurate confidence intervals. Since the p-value is well above the critical threshold, the residuals of the model appear to follow a normal distribution, supporting the reliability of the model's estimates and its use for predictive purposes.

5 Conclusion

The study has provided a comprehensive analysis of the impacts of international trade variables exports, imports, exchange rates, and investment on Tanzania's economic growth from 1990 to 2022. The results surprisingly indicate that imports have a negative and statistically significant impact on Tanzania's economic growth. This can be explained by the country's high dependence on importing essential goods, including machinery, fuel, and consumer products, has created a persistent trade deficit that hampers economic progress. Furthermore, the depreciation of the Tanzanian shilling has

exacerbated the negative effects of imports by making foreign goods more expensive. This underscores the importance of addressing exchange rate stability as part of the broader strategy to promote sustainable growth.

Investment has emerged as a crucial driver of Tanzania's economic performance, with the positive and impact of private investment on GDP. This suggests investment in infrastructure has attracted private investment. Overall, the study concludes that Tanzania's economic growth is closely linked to its ability to export more, stabilize its currency, and increase investment. Achieving long-term growth requires a multifaceted approach that encourages export diversification, reduced reliance on imports, and promotion of policies aimed at stabilizing the exchange rate and establishing a conducive investment climate. Tanzania should focus on diversifying its export base beyond primary commodities, such as gold and agriculture, by promoting value-added products. Encouraging the growth of the manufacturing sector can lead to more competitive exports to earn more export revenue and reduce vulnerability to global commodity price fluctuations.

The government should work to reduce the trade deficit by promoting import substitution industries and encouraging domestic production of goods that are currently imported, such as machinery and consumer goods. This will reduce dependence on imports and strengthen local industries. Policies should be implemented to manage exchange rate volatility, which negatively affects economic growth. Strengthening foreign exchange reserves and promoting stable monetary policies will help reduce inflationary pressures and improve investor confidence. The government should create a more favorable business environment to attract both foreign and domestic private investment, especially in sectors like manufacturing, infrastructure, and agriculture. Incentives such as tax breaks, simplified regulations, and improved access to finance can foster more investment. In order to export more so that to realize more increased investment in critical infrastructure, such as transport networks, energy, and technology, is essential to support industrial growth and improve trade efficiency. Expanding infrastructure will not only improve export capacity but also reduce the cost of doing business, thus attracting more investment and fostering economic growth.

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