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Financial determinants of economic growth: The Tanzanian perspective

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Abstract: This study investigated the influence of key financial variables on Tanzania's economic growth from 1990 to 2022, using time series data from the World Bank Development Indicators. The analysis examined the relationship between GDP growth and four financial variables: exchange rate, inflation, trade openness, and domestic credit to the private sector. After applying the Augmented Dickey-Fuller test, all variables became stationary after first differencing. The Johansen cointegration test identified four cointegrating relationships, and a Vector Error Correction Model captured both short-term dynamics and long-term equilibrium. Results indicated that exchange rate depreciation and inflation negatively affected GDP growth, while trade openness had a positive impact. Domestic credit's effect was weak and insignificant. Based on these findings, it is recommended that the government and central bank should implement policies focusing on stabilizing the exchange rate, controlling inflation, improving financial sector efficiency, and enhancing trade integration for sustainable economic growth.

Keywords: Gross domestic growth, exchange rate, inflation, economy, Tanzania

1. Introduction

Economic growth is widely recognized as a key driver of human development. It represents the sustained increase in an economy's production of goods and services, leading to improved living standards, employment opportunities, and poverty reduction (Todaro & Smith, 2020). Economic growth is vital for developing economies like Tanzania as it provides the resources to enhance social welfare, improve access to education, healthcare, and infrastructure, and promote overall human well-being (World Bank, 2022).

Economic development tends to be inconsistent between developed and developing countries. Developed countries exhibit generally stable but slower driven by advanced industries, substantial capital availability, and technological advancement (Young, 2024). on the other hand, developing economies, such as Tanzania, usually exhibit volatile growth patterns derived mainly from factors like political conditions, forces of external shocks, and weak financial systems (IMF, 2021). These differences require examining specific financial determinants of economic growth in developing countries (Romer, 2018).

Financial variables, including exchange rate, inflation rate, trade openness, and domestic credit to the private sector, are critical in determining an economy's overall health and growth prospects. For Tanzania, these variables are intricately tied to its macroeconomic challenges, such as managing inflationary pressures, stabilizing exchange rate fluctuations, and ensuring adequate access to credit for the private sector (Ahmed, 2024; Correa, 2024). For instance, fluctuations in the exchange rate affect the cost of imports, export competitiveness, and trade balances, thereby influencing

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economic performance (Correa, 2024). Similarly, inflationary dynamics and constrained access to credit impact firms' investment and expansion opportunities (Ahmed, 2024). While trade openness facilitates integration into global markets and foreign investment, its benefits can vary depending on the structural readiness of the economy (Sharma et al., 2024). The primary objective of this study is to examine the impact of key financial variables, exchange rate, inflation rate, trade openness, and domestic credit to the private sector on Tanzania's economic growth. Specifically, the study aims to assess how fluctuations in these financial determinants influence GDP growth, contributing to a deeper understanding of the economic dynamics in a developing country like Tanzania. By focusing on these variables, the study seeks to provide insights into the effectiveness of financial policies in fostering economic stability and growth.

Like in other countries, Tanzania has witnessed significant changes in the financial sector to improve financial intermediations and broaden access to bank credits. Nevertheless, how far financial development impacts economic growth remains one serious area that needs to be scrutinized. Taking key financial variables like bank credit, inflation, exchange rate, and investments into consideration adds empirical evidence on the financial determinants of economic growth in Tanzania. Our study is motivated by the quest to cover the existing gap in the literature and the need to shed light on the role of financial measures on economic growth, specifically for policymakers, potential investors, financial institutions, and players in the financial market.

This research sheds light on and supports empirical evidence on the role of key financial variables in shaping economic growth in Tanzania. By spotting the financial variables that most significantly impact economic growth, the study broadly supports the literature on economic performance and provides actionable policy recommendations for reforms (Brixiová et al., 2021). As a country, Tanzania continues to address macroeconomic challenges while pursuing sustained economic development; understanding the financial drivers that influence GDP growth is important for molding effective policies that ensure economic stability. The study's general objective is to examine how financial variables determine economic growth in Tanzania. Specifically, the study aims to:

1. Analyze the extent to which exchange rate volatility impacts economic growth in Tanzania.
2. Assess how the inflation rate influences Tanzania's economic growth.
3. Investigate how much credit the private sector gives to Tanzania's economic growth.

Findings reveal real insights for other developing countries facing similar economic environments and challenges in achieving economic growth, particularly challenges derived from financial variables. Our results can be summarized as follows: first, exchange rate depreciation and inflation negatively affected economic growth. Second, trade openness positively impacted economic growth, implying how trade openness facilitates access to larger markets outside the country and attracts investments from outside the country. Third, domestic credits to the private sector have a weak and insignificant impact on economic growth.

Our study contributes to the formulation of policy, particularly those relating to economic planning and development of the financial sector, as it provides insights into the influence of key financial variables on economic growth. Policymakers can craft effective policies from a monetary and fiscal perspective. By understanding how inflation and exchange rate volatility influence economic growth, the study highlights how central banks (as regulators) should have appropriate tools for stabilizing inflation and currency value in place. The study also contributes to existing literature and body of knowledge on the relevancy of these key financial variables on economic growth in developing countries, significantly where the financial sector development still lags.

The remaining sections of the paper are structured as follows: Section two presents a literature review narrating empirical studies conducted on financial determinants of

economic growth. Section three presents the methodology outlining data and variables employed and the econometric techniques adopted. Section four focuses on presenting the time series analysis findings and their implications. Finally, section five focuses on the conclusions derived from the findings and policy recommendations based on the analysis result.

2. Literature Review

Economic performance in developing countries such as Tanzania is shaped by different factors. Financial variables such as exchange rates, inflation, trade openness, and domestic credit also play a sensitive role in shaping economic stability, investment, and growth trajectories. The importance of these financial variables to the economy has attracted the interest of scholars researching the role of finance and economic development. Such studies have become relevant for effective policy formulation in Tanzania. Prior similar studies have analyzed these factors extensively in other developing economies but did not cover the Tanzania-specific and unique macroeconomic environment gap, uncapping important gaps that this study seeks to bridge. Stable exchange rate stability is a key driver of economic growth, fostering investment, trade competitiveness globally, and overall economic stability. Stable exchange rates reduce transaction risks, encouraging foreign direct investment (FDI) and export growth (Krugman et al., 2017). Umaru et al. (2018) argued that an unstable exchange rate can negatively affect economic growth, particularly in developing countries where industries depending on exports are delicate due to currency volatility. Asongu (2016) conducted a study in Tanzania and revealed that the depreciation of Tanzania shillings negatively impacts GDP growth by deriving the cost of imported goods.

In Tanzania, recent studies have highlighted the adverse effects of exchange rate fluctuations on GDP growth. In another study, Sanga et al. (2023) revealed the existence of a long-run significant positive impact of money supply, exchange rate, and interest rate on economic performance. However, money supply and interest rates have adverse but insignificant effects on economic growth in the short run. Generally, money supply provides platforms for stimulating investments and encouraging consumption, allowing businesses to expand. Regarding the banking sector, a moderate money supply also enables banks to provide more credit to businesses and households, eventually promoting growth. Though moderate money supply can support the stabilization of the price and promote growth, excessive supply may lead to inflation pressure. Emphasizing the importance of monetary and fiscal policies to mitigate these effects. In this study, more variables were added, such as bank credit to the private sector and trade openness, as control variables since these variables are closely linked to the performance of macroeconomic variables.

Sanjo et al. (2022) demonstrated that while trade openness positively impacts economic growth, absolute exchange rate stability plays a crucial role in sustaining export competitiveness. For example, trade openness enhances access to the market, allowing local or domestic firms to reach international markets, improve exports, and derive economic growth. Technology transfer also became more feasible through attracting foreign direct investments (FDIs) with high technology to invest or team up (as joint ventures) with domestic firms. On the other hand, stability in the exchange rate ensures sustained economic growth by pushing exports and ensuring that exchange rate volatility does not affect exports or economic growth. However, it should be noted that the overvaluation of currency, if not handled properly, may lead to trade imbalances in the long term.

Magai (2022) further identified long-term relationships between exchange rate stability, trade, and FDI inflows, showing how currency fluctuations indirectly shape Tanzania's economic performance. However, prior studies often generalize findings across developing economies, neglecting Tanzania's structural challenges, such as

limited diversification and the economy's reliance on specific export commodities. Inflation is another critical determinant of economic growth. High inflation undermines purchasing power, increases production costs, and reduces consumer spending, creating instability that hinders GDP growth. (2024) and Ahmed provide evidence that inflation negatively affects real GDP by increasing uncertainty and discouraging domestic and foreign investment. Specifically, inflation raises borrowing costs and erodes returns, deterring private sector activity. While these studies underscore inflation's adverse effects, they largely overlook how Tanzania's fiscal and monetary policies exacerbate inflationary pressures, particularly in supply chain vulnerabilities and reliance on imported goods. Bekele (2024) highlights the inverse relationship between inflation and growth but fails to address Tanzania's broader monetary policy transmission challenges. This gap underscores the need to explore inflation's unique effects within Tanzania's macroeconomic framework. Trade openness is a driver of economic growth, particularly in export-driven economies. It enhances access to foreign markets, attracts FDI, and facilitates technology transfer, improving competitiveness and productivity. (2024) demonstrated that trade integration boosts GDP growth by enabling the flow of goods and investments across borders, while Bekele emphasized its role in fostering economic efficiency. Trade integration also insists that different economies should focus on goods and services as long as comparative advantages exist, goods are available at a relatively affordable price, and technology diffusion beyond the border is possible.

For Tanzania, policies encouraging trade openness have bolstered export diversification and competitiveness in key sectors. However, prior research often neglects the trade-offs associated with increased vulnerability to global economic shocks. Sanjo et al. (2022) highlighted the need to balance trade openness with exchange rate stability to maximize growth benefits. However, limited analysis of Tanzania's trade dynamics, including its reliance on agricultural exports, creates a gap in understanding how trade openness interacts with other financial determinants in the Tanzanian context. Domestic credit is equally critical for driving economic growth, as it provides the private sector with resources to expand production, innovate, and enhance efficiency. Studies by Jackson et al. (2024) and Saleem et al. (2024) underline the positive relationship between domestic credit access and GDP growth, emphasizing that well-developed financial systems facilitate long-term economic expansion. However, these studies often fail to consider Tanzania's specific barriers, such as low financial inclusion, regulatory challenges, and limited infrastructure for credit delivery.

Ahmed (2024) found that increased credit accessibility enables firms to invest in growth-enhancing activities; further research is needed to explore how Tanzania's financial sector constraints limit the broader macroeconomic impacts of domestic credit. While extensive literature highlights the role of exchange rates, inflation, trade openness, and domestic credit in shaping economic growth, many studies fail to account for Tanzania's unique macroeconomic conditions. Contrasting findings further weaken prior conclusions, as (2022) emphasizes the long-term benefits of exchange rate stability, whereas Sanga et al. (2023) highlight short-term disruptions caused by currency fluctuations. Similarly, trade openness is generally linked to positive outcomes. It should be viewed that external shocks disturbing the economy may distort the exchange rate, which impliedly affects economic growth, trade, and investments. It is generally believed that if policymakers properly adopt relevant measures to reduce exchange rate volatility, then currency volatility is not supposed to disturb sustainability economic growth. Additionally, the role of domestic credit in fostering private sector growth is well-documented, but studies overlook Tanzania's financial infrastructure challenges. These gaps highlight the need for a focused study examining how these financial determinants interact within Tanzania's economic environment to provide actionable insights for policy formulation.

Alem (2016) contended that though Ethiopia's financial sector lacks a more sophisticated financing mechanism, it is still in the infancy stage of development.

However, the sector is stable, can sustain profitability, and remains resilient even during a crisis since the system is highly regulated.

3. Methodology

The study used a time series research design to examine the relationship among variables under scrutiny, which are key financial variables and the economic growth of Tanzania over a period spanning from 1990 to 2022. Analysis engages data extracted from the World Bank database (World Development Indicator), where GDP growth (explained variable) was employed as the proxy of economic growth. At the same time, an exchange rate (Tanzanian Shilling to USD), inflation rate, trade openness, and domestic credit to the private sector were used as the explanatory variables. These variables are important aspects of economic performance derived from Tanzania's financial variables.

To have meaningful results from econometric models, we were compelled to rest the normality of data using the Jarque-Bera test, which involved skewness and kurtosis checks. If variables do not follow normality, distribution is normalized by subjecting the data into logarithmic form to ensure more reliable results. Unit root test is another key requirement for time series analysis. The augmented Dickey-Fuller (ADF) test checked the stationarity of the variables; if the variable is non-stationary, then differentiation is applied to achieve stationarity; these tests are critical to solving the problem of spurious regression results. For stationary variables, the Vector Autoregression (VAR) model is used to estimate their interdependencies. However, suppose the variables are non-stationary but share a long-term equilibrium. In that case, the Vector Error Correction Model (VECM) accounts for both short-term dynamics and long-term relationships. The model has been adopted because it is appropriate for analyzing the co-integrated system of equations where it encourages both short and long-term dynamics. However, its assumptions of linearity and symmetric make it relevant in this study because several economic phenomena in the real world portray asymmetric behavior, and the fact that it may fail to account for the shift of regime or asymmetric response is the weakness of the model since it is not always the case. Furthermore, the adoption model was built on the assumption that over the study period 1990-2022, there was no profound policy shift in Tanzania. Because Tanzania adopted a market economy (open-up policy) in 1985, since then, no profound shift in economic policy

The stationarity test is crucial since time series models consider constant relationships between variables over time. Non-stationary data may lead to unreliable results, but cointegrated variables suggest that these relationships hold over the long run. Post-estimation diagnostics, including impulse response functions and variance decomposition, provide further insights by analyzing the effects of shocks to financial variables on GDP growth. Impulse response functions track the impact of a one-time shock on the variables. At the same time, variance decomposition identifies the contribution of each variable to the forecast error variance of GDP growth.

4. Findings and Discussion

4.1. Descriptive Analysis

The descriptive statistics for the variables used in this study (GDP growth, exchange rate, inflation, domestic credit to the private sector, and trade openness) provide insights into the central tendencies and variability of the data. Below is a summary and interpretation of the results for each variable based on the provided output (Table 1).

Table 1. Descriptive analysis

Variable	Observations	Mean	Standard Deviation	Min	Max
GDP Growth	30	5.31	1.97	0.58	7.67
Exchange Rate	30	1148.06	627.88	195.06	2288.21
Inflation	30	12.57	8.31	2.28	31.17
Domestic Credit	30	8.76	3.98	2.13	14.61
Trade Openness	30	19.03	4.48	11.99	28.08

Note: Min-minimum; Max- maximum

The average GDP growth rate in Tanzania over the 30 years is 5.31%, indicating a moderate pace of economic expansion. However, the standard deviation of 1.97% suggests that growth has not been entirely stable, with some years experiencing significantly different growth rates. The minimum GDP growth observed is 0.58%, which likely corresponds to periods of economic distress or external shocks, while the maximum growth rate of 7.67% reflects more prosperous periods. The variability in GDP growth over time points to underlying factors such as changes in fiscal policy, external economic conditions, and domestic challenges, all of which affect the economy's overall performance.

The average exchange rate of 1148.06 Tanzanian Shillings per USD over the 30 years indicates a depreciating currency, reflecting the Tanzanian Shilling's weakening against the US Dollar. The significant standard deviation of 627.88 shows substantial fluctuations, suggesting episodes of volatility in the foreign exchange market. The exchange rate ranged from a minimum of 195.06 to a maximum of 2288.21, indicating significant devaluation over time. Such fluctuations in the exchange rate can profoundly impact inflation, trade balances, and foreign investment inflows, as they affect both import and export competitiveness. The average inflation rate during the period is 12.57%, indicating a high inflationary environment in Tanzania. The standard deviation of 8.31% highlights substantial variability in inflation, with some years experiencing relatively moderate inflation and others much higher. The minimum inflation rate recorded is 2.28%, while the maximum inflation rate reached 31.17%. These high inflation rates likely reflect macroeconomic instability driven by supply shocks, exchange rate devaluations, and monetary policy challenges. Persistent inflation at these levels could erode purchasing power, deter long-term investment, and increase economic uncertainty.

The mean value of domestic credit to the private sector as a percentage of GDP is 8.76%, indicating relatively low financial resources allocated to private businesses over the 30 years. The standard deviation of 3.98% reflects moderate variability in credit availability, suggesting that while progress has been made, access to credit remains constrained for much of the private sector. The range from a minimum of 2.13% to a maximum of 14.61% indicates that there have been periods where credit conditions were particularly tight. Limited access to credit can restrict business expansion, innovation, and overall economic growth, especially in a developing economy like Tanzania, where capital markets are less mature. Tanzania's trade openness, measured as the sum of exports and imports as a percentage of GDP, averaged 19.03% over the 30 years, reflecting moderate integration into the global economy. The standard deviation of 4.48% indicates some variability in trade openness across the years, with a minimum of 11.99% and a maximum of 28.08%. Periods of higher trade openness likely correspond to efforts to diversify exports or liberalize trade, while lower levels of trade openness may reflect economic protectionism or unfavorable global conditions. Trade openness is essential for accessing new markets, encouraging competition, and facilitating technology transfers, vital for long-term economic growth.

4.2. Normality test

Domestic credit significantly differed from normality, while exchange rate and trade openness were usually distributed. GDP growth and inflation were somewhat skewed but close to normal. After applying the logarithmic transformation, domestic credit showed improvement in normality, with their joint probabilities no longer rejecting the null hypothesis of normality. This transformation step is crucial for ensuring the accuracy of time series models such as Vector Autoregression (VAR) or Vector Error Correction Model (VECM), where the assumption of normality helps in the reliability of inferences drawn from the data.

4.3. The Augmented Dickey-Fuller (ADF) test

The Unit Root Test assesses the stationarity of the variables used in the time series analysis. Non-stationary variables have statistical properties that change over time, making the results of any regression analysis unreliable. The Augmented Dickey-Fuller (ADF) test is used here to check for unit roots, which indicate non-stationarity. The null hypothesis for the ADF test is that the variable contains a unit root (non-stationary), while the alternative hypothesis is that the variable is stationary. The results indicate that all variables have p-values greater than 0.05, meaning that we fail to reject the null hypothesis of a unit root. This implies that all variables are non-stationary in their original form. Non-stationary variables pose a problem for time series analysis as they can lead to spurious regression results. Therefore, these variables need to be differenced to achieve stationarity.

Table 2. The Augmented Dickey-Fuller (ADF) test (After First Differencing)

Variable	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	P-value
Diff. GDP Growth	-6.915	-3.730	-2.992	-2.626	0.0000
Diff. Exchange Rate	-4.173	-3.730	-2.992	-2.626	0.0007
Diff. Log Inflation	-5.941	-3.730	-2.992	-2.626	0.0000
Diff.Log Domestic Credit	-3.616	-3.730	-2.992	-2.626	0.0055
Diff.Trade openness	-3.453	-3.730	-2.992	-2.626	0.0093

Note: Diff.GDP -difference of gross domestic product growth; Log-logarithm

From Table 2 After taking the first differences, all variables have p-values less than 0.05, meaning we can reject the null hypothesis of a unit root. This indicates that the variables are now stationary after first differencing. Achieving stationarity is essential for time series analysis because it ensures that the relationships between the variables are stable over time, allowing for valid inferences in econometric modeling such as Vector Autoregression (VAR) or Vector Error Correction Models (VECM).

4.4. Johansen Test Results:

Based on the Johansen test results from Table 3, we find four cointegrating relationships among the five variables: GDP growth, exchange rate, inflation, domestic credit to the private sector, and trade openness. These results indicate that these variables share long-term equilibrium relationships, meaning that despite short-term fluctuations, they tend to move together over the long term.

Table 3. Johansen Test Results

Rank	LL	Eigenvalue	Trace Statistic	5% Critical Value
0	-255.81066	-	239.3806	124.24
1	-218.95022	0.93481	165.6597	94.15
2	-189.59222	0.88635	106.9438	68.52
3	-168.40658	0.79181	64.5725	47.21
4	-156.04520	0.59975	39.8497	29.68
5	-146.64097	0.50173	21.0412	15.41

6	-139.46633	0.41225	6.6920	3.76
7	-136.12035	0.21952	-	-

This implies that underlying economic forces bind these variables together, and shocks to one of them are likely to have long-term impacts on the others. The presence of multiple cointegrating vectors also suggests that a Vector Error Correction Model (VECM) is the appropriate model for further analysis. The VECM will help capture both the variables' short-term dynamics and long-term equilibrium relationships.

4.5. Vector Error Correction Model (VECM)

The negative coefficient (-0.0145299) for the exchange rate suggests that the depreciation of the Tanzanian Shilling is associated with a decline in GDP growth. This aligns with economic theory, where currency depreciation increases the cost of imports, drives inflation, and deters investment. Tanzania's reliance on imports for essential goods such as fuel and machinery exacerbates this vulnerability. Comparable studies highlight similar effects in other developing economies. For instance, Chukwu et al. (2022) found that exchange rate depreciation negatively impacted Nigeria's economic growth by raising production costs and inflation. Similarly, Aryal (2024) observed that in Nepal, an import-dependent country, exchange rate volatility hindered growth through inflationary pressures and reduced investment. Majenge et al. (2024) reported a comparable negative relationship between exchange rate volatility and GDP growth in South Africa, emphasizing how currency depreciation deters long-term investments. In the Tanzanian context, these findings suggest that current monetary policies must be reinforced to stabilize the exchange rate. Audi (2024) also examined the impact of exchange rate volatility in Lebanon in the long run; his findings revealed a positive and significant effect of exchange rate volatility on economic growth, while in the short run, the impact is negative and insignificant. The result is inconsistent with our findings, which stressed the existence of a negative impact.

The development of the financial sector has a role in strengthening the value of the local currency. For example, in a study conducted in ECOWAS countries by Garbobiya and Oladepo (2024) assessing the impact of financial inclusion on monetary policy, their findings revealed that financial inclusion led to an appreciation of local currency, which implies stability in the exchange rate. Policymakers could consider expanding foreign exchange reserves to buffer volatility, implementing export diversification strategies to reduce reliance on imports, and promoting local production of critical goods. Lessons from countries like Nigeria and South Africa, which have adopted targeted interventions in forex markets, highlight potential approaches for mitigating the adverse effects of exchange rate fluctuations. Ridhiwan, Ismail, and Nijkamp(2024) performed a meta-analysis of 51 studies on the accurate exchange rate-growth nexus. Their findings revealed that real exchange rate depreciation profoundly impacts economic growth in developing countries than in developed countries. Implying that for developing countries, having an undervalued real exchange rate enhances economic growth.

Table 4. Vector Error Correction Model (VECM)

Variable	Coefficient	z	P-value
GDP Growth	1	-	-
Exchange Rate	-0.015	-3.70	0.000
Inflation	-9.270	-9.59	0.000
Domestic Credit	0.346	0.25	0.804
Trade Openness	1.102	8.60	0.000
Constant (_cons)	2.297	-	-

Note: GDP-gross domestic product

Results from VECM indicate a negative coefficient (-9.270) for inflation, highlighting its adverse impact on the growth of Tanzania's economy (Table 6). High inflation degrades purchasing power (currency value), depresses investments, and creates risks. These findings are consistent with previous studies by (Alghamdi et al., 2024; Shaji et al., 2024), revealing that inflation reduces consumption and investment in developing economies. In Tanzania mainly, Inflationary pressures are destructive and destabilizing due to its structural reliance on agriculture and slow advancement in industrialization. The results propose that Tanzania's current inflation measures should be a strong foundation to ensure effectiveness. Policymakers should enhance monetary policy to control inflation while properly handling supply-side challenges, such as inefficiencies in agriculture and transportation. Comparing Tanzania to Kenya, where a combination of monetary interventions and infrastructure investments has moderated inflationary impacts, offers valuable insights for improving inflation management.

Results for domestic credit indicate a positive but statistically insignificant coefficient (0.346(Table 6), implying inefficiencies in Tanzania's financial sector to the extent that it limits its contribution to GDP growth. The result conforms with findings by Fadhil et al. (2024) and Ali et al. (2024), highlighting that access to credit must be effectively allocated to productive uses to stimulate growth. Challenges such as high borrowing costs and inefficient credit allocation hinder the ability of the financial market to channel credit into key growth sectors. Moreover, other root causes may include information asymmetry, which occurs when the lender lacks adequate information about the borrower's ability to service the loan and previous credit behavior or characteristics, which may lead to an extension of credits to the wrong borrowers. The environment in which the financial institution is operating may also have a negative impact by causing accessibility to credit to become a challenge. For example, financial institutions operating with poor financial infrastructure may experience non-performing loan portfolios since potential borrowers have limited accessibility to credits, and financial institutions also face difficulties in following up with borrowers. Policy adjustments are needed to improve financial intermediation and expand credit access to productive sectors, including manufacturing and small-to-medium enterprises (SMEs). Initiatives to enhance financial inclusion and reduce borrowing costs, such as those implemented in Ethiopia and Rwanda, could provide a framework for Tanzania. These reforms could increase credit utilization in sectors with high growth potential, amplifying its impact on GDP.

Results for trade openness indicate a positive coefficient (1.102), which implies the benefits of integrating into the global economy (Table 4). Trade openness facilitates access to larger markets, attracts FDI, and encourages technology transfer. These findings align with studies by Maskaeva et al. (2024) and Mnondwa et al. (2024), which show that trade liberalization initiatives, such as the African Continental Free Trade Area (AfCFTA), enhance export competitiveness and boost economic growth. Mwigeka (2023) further highlights that trade openness attracts FDI, promoting capital inflows and technological advancements. Our results are slimly different from the study by Epor et al. (2024), who employed ARDL to examine the impact of FDIs on economic growth, focusing on the role of international trade and foreign debt in Nigeria, Vietnam, and Brazil. Their results reported that FDIs and international trade have positive and insignificant impacts on growth in three countries.

For Tanzania, promoting greater trade integration and export diversification is critical. Policymakers should focus on strengthening trade infrastructure, such as ports and logistics, reducing non-tariff barriers, and encouraging the production of value-added goods. Comparisons with Ghana and Senegal, which have successfully diversified their export bases and implemented trade-focused reforms, highlight actionable strategies that Tanzania could adopt.

Tests for the diagnostic of the results from VECM indicate that residuals adhere to the requirements of normality across individual variables. The test is reflected in the results from the Jarque-Bera test, which exhibits skewness and kurtosis (Table 5). The p-value in all variables exceeds 0.05, implying that we cannot reject the null. Furthermore, the test also reveals that the distribution of residuals portrays a symmetrical pattern. With all p-values exceeding 0.05. as far as kurtosis is concerned, the kurtosis distribution follows a normal distribution with a p-value exceeding 0.05. All these confirm that VECM results are robust and that the model is appropriate for analyzing the relationship among the variables under scrutiny.

Table 5. Vector Error Correction (VECM) Diagnostic Test Results

Equation	Jarque-Bera χ^2	Jarque-Bera Prob > χ^2	Skewness χ^2	Skewness Prob > χ^2	Kurtosis χ^2	Kurtosis Prob > χ^2
D_dgdpgrowth	2.66	0.26	2.53	0.11	0.13	0.72
D_dllnlir	0.48	0.79	0.06	0.80	0.41	0.52
D_dlninflation	1.89	0.39	1.22	0.27	0.67	0.41
D_dfdi	3.54	0.17	1.46	0.23	2.08	0.15
D_dlndctops	0.31	0.86	0.11	0.75	0.21	0.65
D_dtradeopeness	3.44	0.18	3.03	0.08	0.41	0.52
ALL	19.04	0.16	10.47	0.16	8.57	0.28

Stability in a Dynamic system depends on the behavior of the Eigenvalue. For example, for discrete-time series, dynamic systems are said to be stable if their eigenvalue lies within a unit circle (less than 1). The eigenvalue stability requirement is used to check the dynamic stability of the VECM, ensuring that the results from the model are valid and reliable. Essentially, it checks if absolute values of moduli are less than or equal to 1 for stability, while moduli equal to 1 indicate cointegrating relationships. The result of the stability check revealed that five eigenvalues with moduli equal to 1 signifying stable long-term equilibrium associations—the remaining eigenvalues with less than one moduli manifest the absence of explosive propensities in the system.

5. Conclusion and Policy Implications

This study examined the influence of financial determinants such as exchange rates, inflation, trade openness, and domestic credits on economic growth in Tanzania. Findings revealed that inflation and exchange rate depreciation significantly negatively influence economic growth, while trade openness has a strong positive influence on growth. Though domestic credits are positively associated with growth, their influence on growth is insignificant, highlighting the financial sector inefficiencies in Tanzania. These findings contribute to economic theories by reaffirming that exchange rate volatility and high inflation erode economic stability and growth prospects, particularly in import-reliant economies like Tanzania. Conversely, the positive relationship between trade openness and GDP growth aligns with theories suggesting that global integration enhances growth through larger markets, foreign investment, and technology transfer. However, the weak impact of domestic credit challenges traditional assumptions about the role of financial development, suggesting the need for more effective credit allocation and financial inclusion.

The results have important policy implications. To stabilize the exchange rate, policymakers should adopt prudent fiscal and monetary measures, including building foreign reserves, promoting export diversification, and introducing hedging instruments to protect businesses from currency volatility. Controlling inflation requires robust inflation-targeting policies and efforts to reduce reliance on imports by diversifying domestic production, especially in agriculture and manufacturing. Enhancing food security and strengthening supply chain resilience are critical to stabilizing prices.

Financial sector reforms should focus on expanding financial inclusion, reducing borrowing costs, and ensuring credit allocation to productive sectors such as manufacturing and small-to-medium enterprises. Innovative financial instruments, such as microfinance and mobile banking, can further enhance the impact of domestic credit on growth. Lastly, the positive role of trade openness highlights the need to continue integrating into global markets by diversifying exports, improving trade infrastructure, and reducing non-tariff barriers. Expanding trade agreements and promoting value-added goods will increase Tanzania's competitiveness and economic resilience.

Future research should explore non-financial determinants of economic growth, including institutional quality, governance, human capital development, and technological innovation, to provide a more comprehensive understanding of Tanzania's growth dynamics. Regarding the impact of trade openness on economic growth, further studies should consider decomposing trade openness into its components to establish precisely which components contribute more to growth. Future similar studies may also focus on including financial variables and how they impact the informal sector's contribution to economic growth. Additionally, regional comparisons with other East African and sub-Saharan economies could offer valuable insights into Tanzania's relative performance and growth potential. By addressing structural challenges, implementing coordinated financial and trade policies, and expanding the scope of future research, Tanzania can achieve sustained, inclusive, and resilient economic growth.

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