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The Impact of Foreign Aid on Economic Growth in Tanzania

Sangawe Careen Godwin

Master's of Business Management, School of Business, Nanjing University of Information Science & Technology, Nanjing, China.

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Corresponding Author:
Sangawe Careen Godwin

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ABSTRACT

The study analyzes the impact of foreign aid on Tanzania's economic growth from 1988 to 2022, contributing to debates on external financial assistance in developing economies. Using augmented Dickey-Fuller (ADF) tests, autoregressive distributed lag (ARDL) bounds test, and vector autoregression (VAR), it examines the relationship between GDP growth, foreign aid, inflation, exchange rates, and external debt. The findings confirm cointegration and a long-term relationship among these variables. Regression analysis shows that all variables, including foreign aid, positively influence GDP and foster economic growth. However, the study reveals that while foreign aid supports short-term GDP growth, its long-term effectiveness depends on macroeconomic stability, especially managing exchange rates and inflation. It challenges simplistic views of foreign aid's benefits and stresses the need for strategic policies for sustainable development in Tanzania. The research advocates for government measures to encourage foreign aid and foreign direct investment (FDI) while maintaining openness to international markets. These strategies can boost the economy, create jobs, reduce poverty, and control inflation. Although limited by historical data and its focus on Tanzania, the study opens pathways for further research, including comparative studies with similar economies. Overall, it highlights the constructive role of foreign aid and FDI in economic growth and the importance of supportive policies for sustained expansion.

INTRODUCTION

Research on foreign aid's impact on developing countries has expanded significantly over the past 40 years. Various studies have produced mixed results: some, like Arndt et al. (2010) and Solow (1956), find foreign aid positively influences economic growth, while others, including Rajan and Subramanian (2008), report no significant effect. Recent developmental economics research consistently links foreign aid to economic progress, examining its effects on growth, infrastructure, and human capital (Momoh et al., 2025; El Hebabi & Hossain, 2025). Foreign aid is recognized as crucial for meeting immediate financial needs and laying the groundwork for sustainable development and economic self-sufficiency. Clemens et al. (2012) and Arndt et al. (2010) show foreign assistance can boost GDP and development potential in poorer nations. Historical data analyses, such as by Juselius et al. (2014), confirm foreign aid's significant but sometimes limited impact on growth. The research underscores the complex relationship between aid and economic development, highlighting the need for careful assessment of foreign aid's effectiveness in supporting sustainable growth. Understanding both the benefits and limitations of aid can help policymakers optimize its advantages for recipient countries. The Marshall Plan, launched by the US in the 1940s, marked early efforts to aid Western Europe's post-war recovery, sparking broader attention to foreign aid's role in developing economies (Lensink & Morrissey, 2010). Foreign aid, focused on poverty reduction and global economic progress, often comes with conditions that developing countries must meet, influencing donor nations' political and economic power (Jiffar, 2015; World Bank, 2015). In the 1940s and 1950s, institutions like the World Bank and IMF collaborated with donors to support economic growth through foreign aid. Aid allocation varies by need, often tied to natural disasters or conditional on reforms. During the early 1980s, much aid was conditional on democratic and economic reforms, enforced through Structural Adjustment Programs (SAPs) aimed at economic liberalization and privatization

(World Bank, 2015). SAPs sought to reduce state control over key economic sectors and stabilize macroeconomic indicators like inflation, debt, and trade balances. By the 21st century, foreign aid shifted focus towards poverty alleviation and social programs, targeting healthcare, agriculture, and education (World Bank, 2015). Overall, foreign aid has evolved from post-war recovery to complex programs balancing economic reforms with social development goals.

1.1 Foreign Aid in Tanzania

Historical records show Tanzania has received foreign aid from multiple countries over a long period, significantly impacting its economic growth. Foreign aid, mainly grants and loans, has amounted to about 20% of Tanzania's GDP, mostly from bilateral European donors who provide around 70% of the aid. This aid supplies foreign currency needed to finance investments and imports, helping balance fiscal and foreign exchange deficits and supporting infrastructure and development projects. Since independence in the 1960s, Tanzania has remained one of the poorest nations, relying heavily on foreign aid to fund development, despite aid inflows not fully meeting goals like poverty reduction or rapid economic growth (Wohlgemuth, 2016). Foreign aid accounts for 80% of Tanzania's development budget and 40% of its total budget (Elikana & Mapunjo, 2014). In 2018–19, Tanzania received significant grants and concessional loans totaling billions of shillings, allocated across budget support, basket funds, and project funds (MoFP Budget Implementation Report 2018–19). Global initiatives like the Paris Declaration call for better mechanisms to ensure aid reaches developing countries effectively and is used responsibly (Mutalemwa, 2013; Hossain & Nur, 2024). Despite reforms aiming to increase recipient control over development aid, Tanzania remains dependent on foreign assistance from over 30 donors and multiple funding mechanisms since the 1960s, similar to other African countries.

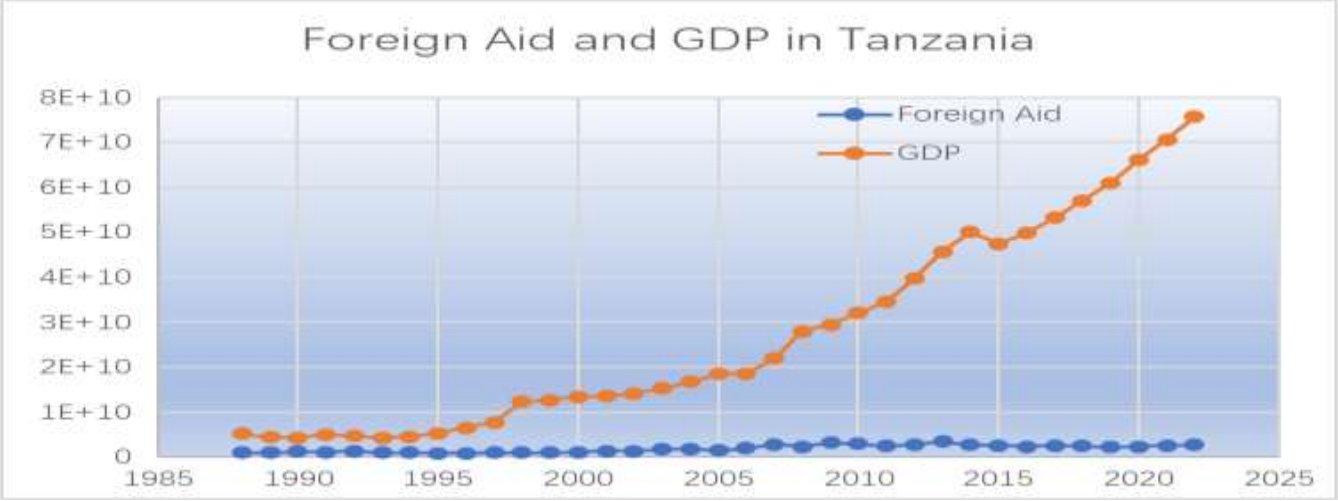

Figure1: Trends on Foreign Aid and GDP in Tanzania from 1988 to 2022
(*Source: researchers computed with data from the World Bank 2022)*

Between 1988 and 2022, Tanzania's GDP showed steady and significant growth, rising from about $10 billion in the early 2000s to over $75 billion by 2022. Foreign aid, represented by a fluctuating blue line, mostly stayed below $2 billion until the early 2000s, peaked above $3 billion in 2009, and then gradually declined to around $2.5 billion in recent years. Early aid fluctuations likely reflect changes in global economic conditions, donor policies, and Tanzania's own policies, with the 2009 peak linked to increased donor support during the global financial crisis. Since 2010, foreign aid has stabilized, suggesting a need for Tanzania to focus on strategic aid use or boost economic self-reliance. The consistent GDP growth is attributed to structural reforms, investments in infrastructure, and favorable global economic trends. The graph shows a complex relationship between foreign aid and GDP, indicating that while aid contributes, Tanzania's robust economic growth is primarily driven by local reforms and global factors, despite fluctuations in aid levels.

Research on the impact of international aid on Tanzania's economic growth has produced mixed results. Some studies (Boone, 1996; Mosley et al., 1987; Ranjan & Subramanian, 2008) found no relationship or a negative effect of foreign aid on economic development, while others (Monoiu and Sanjay, 2009; Clement et al., 2012; Arndt and Jones, 2015) reported a significant positive association. Methodological differences likely explain these divergent findings, though cross-national studies show some consensus. Choong et al. (2010) analyzed Tanzania's aid effectiveness from 1970 to 2002 using autoregressive distributed lag (ARDL) models, a period extended by more recent research to 2018. Between 2002 and 2013, Tanzania received over three times more development assistance, with GDP growth stable at above 7%. However, Kabete (2008) and Conchesta (2008) highlight conflicting conclusions about aid's impact on Tanzania's economy, noting that foreign aid and debt repayment can harm GDP growth. Conversely, increases in exports and national savings positively contributed to investment capacity. Despite substantial foreign aid inflows, Tanzania's economy remains slow-growing, with high poverty and persistent budget deficits (Albiman, 2016).

This research aims to analyze thoroughly how foreign aid influences the economic growth of Tanzania. This analysis seeks to illuminate the significant impact that foreign assistance has had on the economic landscape of Tanzania. The study specifically set out to achieve the following objectives: (1) Investigate how exchange rates influence Tanzania's economic expansion. (2) To ascertain how Tanzania's economic growth is influenced by the rate of inflation (4). The objective is to investigate the impact of exchange rate fluctuations on Tanzania's economic growth. (3) Trade and investment promotion: foreign aid may focus on enhancing trade and attracting investment by improving trade policies, reducing barriers, and promoting Tanzania as an investment destination. This helps integrate the country into the global economy. (4) For private sector development, foreign aid can support private sector growth by providing access to finance and technical assistance and fostering a favorable business environment. A vibrant private sector is a key driver of economic growth.

LITERATURE REVIEW

This section provides an overview of current research on the relationship between foreign aid and economic growth. It includes key term definitions, a conceptual framework, and both theoretical and empirical reviews. Foreign aid from industrialized countries aims to support economic growth and address social and economic challenges in developing nations, as noted by Alesina and Dollar (2015) and the OECD (2019). Official Development Assistance (ODA) refers to financial aid given to governments in developing countries to promote growth and improve citizens' welfare, excluding military-related loans, and can be provided bilaterally or through multilateral organizations like the World Bank or UN. The study focuses on types of aid given to Tanzania to support its economy through budgetary and development project financing. Economic growth is defined as an increase in national income per capita, measured here by GDP (Haller, 2012; Nafziger, 2006). Foreign Direct Investment (FDI) is also examined as a driver of domestic technological progress and capital formation, involving foreign investors holding control or influence in local firms (OECD, 1996). Development expenditures funded by foreign aid target infrastructure projects such as roads, communication, electricity, and irrigation, acting as an external factor that boosts aggregate output and economic growth (Anor, 2007; Sampa & Hossain, 2024).

2.1 The theoretical framework

This theory links foreign direct investment (FDI) and official development assistance (ODA) with economic growth. The Solow Growth Model emphasizes skills and technology to boost domestic capital and overall capital stock (Findlay, 1978), while Romer's endogenous growth theory highlights internal factors like innovation, capital accumulation, and technical knowledge as key drivers of growth (Romer, 1986; Barro, 1990). The theory explains how foreign aid and FDI can foster growth by investing in infrastructure, human capital, technology transfer, and addressing issues like trade deficits and fiscal gaps (Harrod-Domar model, Chenery and Strout's two-gap model, Bacha and Taylor's three-gap model). However, aid's impact varies depending on aid efficiency, governance, institutions, and policy environments (Hossain et al., 2024). While foreign aid has helped Tanzania's development and humanitarian needs, its role in sustaining long-term economic growth is mixed. Challenges include aid dependence, weak governance, misalignment with development goals, and limited private sector growth. Ultimately, foreign aid's success in Tanzania hinges on effective use and alignment with local policies focused on sustainability and poverty reduction.

2.2 Hypothesis on Economic growth

The review of foreign empirical studies reveals a global research interest in how foreign aid affects developing economies. Most scholars advocate using foreign aid to reduce poverty and stimulate economic growth, as argued by Sachs (2005a, 2005b). However, others like Rajan & Subramanian (2008), Easterly (2007), and Boone (1996) question aid's effectiveness, suggesting it has not significantly boosted recipient economies. Burnside & Dollar (2000) emphasize that strong macroeconomic policies enhance aid's impact, while Arndt and Jones (2009) and others argue aid can promote growth without conditions. Ranjan and Subramanian (2008) found limited evidence supporting aid's positive effect on growth, aligning with Boone (1996) and Mosley et al. (1987), who reported little or negative impact. Dollar and Burnside (2000) introduced the "assistance strategy" concept, highlighting the need for efficient aid programs alongside macroeconomic policies such as low inflation and sustainable fiscal measures. Later studies by Easterly et al. (2004), Arndt and Jones (2015), Clemens et al. (2012), Hansen and Tarp (2001), and Juselius et al. (2014) generally found positive long-term effects of aid on growth and investment, though with diminishing returns. Minoiu and Sanjay (2009) distinguished developmental aid as growth-promoting, while non-developmental aid had neutral or negative effects. Overall, the literature shows a nuanced and mixed understanding of foreign aid's role in economic growth.

2.3 Local Empirical Studies

Nyoni's 1998 study investigated foreign aid's effects on Tanzania's economy, finding that while increased government spending hurt the economy, aid revenues, economic openness, and currency devaluation improved its real value. Importantly, the study concluded that foreign aid did not cause the Dutch disease in Tanzania, using cointegration and error correction models. It also suggested that strategic, profitable investments could foster positive economic responses. Conchesta's study (1990–2004) used regression and descriptive statistics to analyze Tanzania's economic development and foreign aid relationship. Chong et al. (2010), examining 1970–2002, found a reverse correlation but confirmed foreign aid's significant role in supporting growth through

regression analysis. Ramadhan's 2016 study (1992–2014) used vector autoregression (VAR) and Granger causality to assess aid's short- and long-term impact, finding a long-term association between aid and economic development but emphasizing that short-term growth depends on more than just aid. Overall, these studies highlight that foreign aid, when paired with sound policies, can support Tanzania's economic growth, though sustainable progress requires exploring additional growth avenues.

2.4 Identifying Research Gap

Despite extensive research on foreign aid's impact on economic growth, there is no clear consensus, especially regarding Tanzania. Some studies find a positive link between aid inflows and growth, while others report no effect or negative impacts. This divergence reveals a key research gap: the limited examination of how specific policies, governance quality, sectoral allocation of aid, and contextual factors influence aid's effectiveness in Tanzania. Past research often produced mixed results due to differences in methods, neglecting institutional quality and local conditions. This study aims to fill that gap by analyzing the role of governance, policy, sectoral aid distribution, and other contextual elements, using both qualitative and quantitative data to clarify when and how aid supports Tanzania's economic growth. Additionally, given the substantial rise in aid over recent decades, an updated and holistic assessment is needed. This research will offer a current perspective on the evolving relationship between foreign aid and economic progress in Tanzania, considering changes in aid flows and policies. Its findings will enrich the discourse on aid effectiveness and guide policymakers and development practitioners in optimizing aid's impact. Prior studies by Jones (2015), Conchesta (2008), Chong et al. (2010), and Ramadhan (2016) provide varied views, underscoring the necessity for a comprehensive evaluation amid growing aid inflows.

2.5 The theoretical conceptual framework.

The impact of Foreign Aid on Economic Growth in Tanzania. This research's theoretical foundation is grounded in both theoretical and empirical reviews, emphasizing the relationship between economic growth and foreign aid. In this context, economic growth is considered the dependent variable, influenced by a variety of factors, with foreign aid as the independent variable. The framework also accounts for other control variables that impact economic growth. This analytical approach implies that the effectiveness of foreign aid on a country's economic expansion is significantly influenced by the recipient country's characteristics and policy intentions. It is critical to consider potential endogenous connections between economic growth and foreign aid, as these two factors could influence each other, necessitating a rigorous approach to ensure valid and reliable conclusions. A key theoretical foundation is growth theory, which underscores the importance of increased efficiency, productivity, and technological advancement as drivers of economic growth. This theory provides a perspective for understanding how foreign aid can contribute to economic growth by facilitating improvements in these areas, as posited by Lim (2001).

(1) Economic indicators' theoretical significance- Economic growth is a multidimensional concept that is influenced by a variety of factors. To comprehensively assess the impact of foreign aid, this study examines key economic indicators beyond just GDP growth rates. Some critical indicators include: (i) Investment Rates Foreign aid can potentially increase domestic investment by supplementing domestic savings and easing foreign exchange constraints. Analyzing investment rates sheds light on aid's role in capital accumulation and its subsequent effect on economic growth. (ii)Aid inflows can influence a country's trade balance by allowing increased imports of capital goods and other resources necessary for development projects. Examining trade dynamics reveals aid's impact on reducing foreign exchange gaps. (iii)Government Spending, Foreign aid, particularly program aid, can directly support government budgets and expenditures. Analyzing government spending patterns uncovers how aid contributes to public investment in growth-enhancing sectors like infrastructure, education, and healthcare. (iv)Employment and Productivity, Economic growth is intrinsically linked to labor market dynamics. Assessing indicators like employment rates, sectoral productivity, and wage growth provides insights into aid's role in promoting inclusive and sustainable economic development. This study acknowledges the potential endogenous relationship between economic growth and foreign aid, where aid can influence growth and growth can also impact aid inflows.

To address this endogeneity concern, the research methodology employs the following strategies. (i)Dynamic Panel Data Models by utilizing panel data spanning multiple years, dynamic panel data models like the Arellano-Bond estimator are employed. These models account for potential reverse causality by including lagged values of the dependent variable (economic growth) as regressors. (ii)Instrumental Variable (IV) Approach: In two-stage least squares (2SLS) regressions, appropriate instrumental variables that are correlated with foreign aid but not directly with economic growth are identified and used. Factors such as donor countries' economic conditions, political relationships, or historical ties with Tanzania can be used as potential instruments. (iii)Robustness checks are conducted using alternative measures of foreign aid (e.g., aid per capita, aid as a percentage of GDP), different periods, and sub-samples based on aid modalities or sectoral allocation.

This ensures the consistency and reliability of the findings. The impact of foreign aid on economic growth may vary depending on the specific circumstances of the recipient country. Factors such as inflation, external debt, and exchange rates can affect a nation's capital stock, technological progress, and overall economic performance, aligning with traditional economic theories like Keynesian economics. This study aims to give a thorough and accurate look at the complicated link between foreign aid and economic growth in Tanzania by focusing on the theoretical importance of key economic indicators, explaining how to deal with endogeneity, and looking at the role of macroeconomic factors.

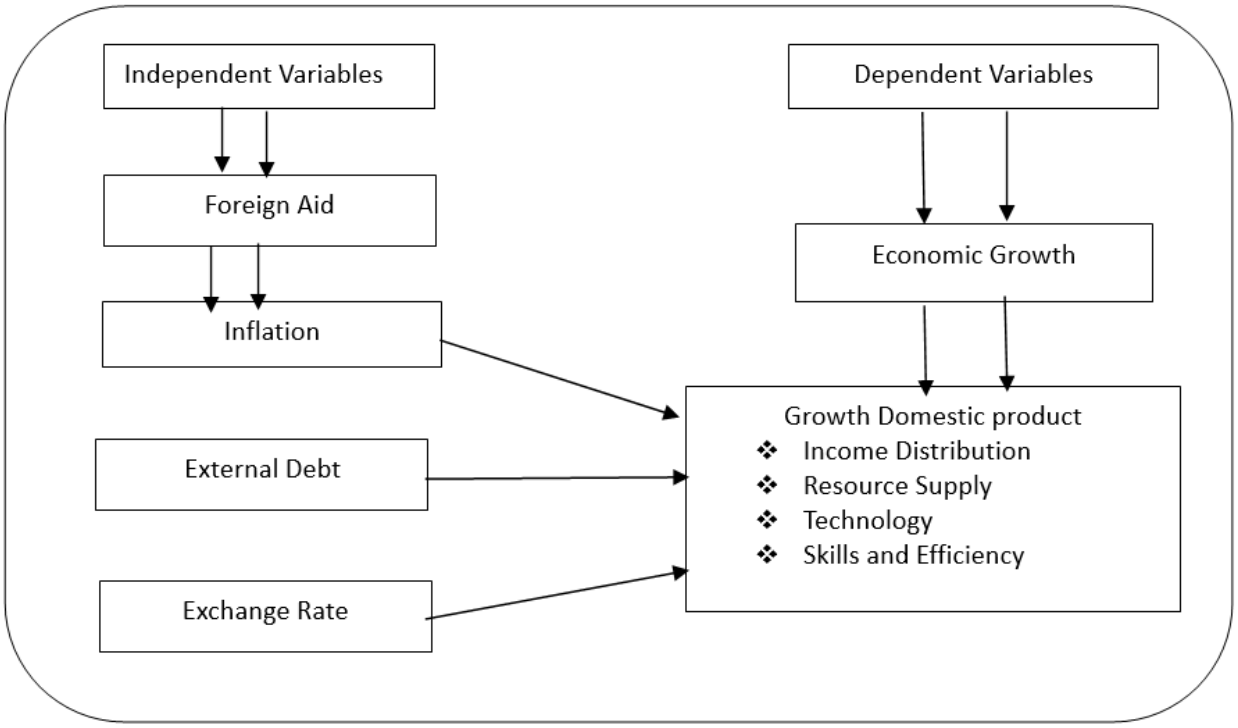

Figure 2: Conceptual Framework

The composition of commodity demand, income distribution, population size and composition, social interaction patterns, and religious beliefs, concepts, and organizations all influence each other, as well as consumption patterns and living standards, are all implied to have changed accordingly. To put it succinctly, economic development is the result of a prolonged sequence of interconnected changes to the fundamental elements of supply and demand that, eventually, increase a country's gross national product.

2.6 Research Hypothesis Development

Based on the theoretical foundations and empirical evidence discussed in the preceding sections, the following hypotheses are formulated to investigate the impact of foreign aid on key economic indicators in Tanzania:

Hypothesis H1: Foreign aid has a positive impact on the GDP growth rate in Tanzania. This hypothesis is grounded in the Two-Gap Model (Chenery & Strout, 1966) and empirical evidence from previous studies (Burnside & Dollar, 2000; Hansen & Tarp, 2001). The two-gap model suggests that economic growth in developing countries is constrained by the savings gap and the foreign exchange gap. Foreign aid can help bridge these gaps by providing additional investment resources and facilitating the importation of capital goods and technology (Chenery & Strout, 1966). Empirical studies have found that foreign aid can stimulate economic activity by funding infrastructure projects, enhancing productive capacity, and promoting technological transfer (Burnside & Dollar, 2000; Hansen & Tarp, 2001).

Hypothesis H2: Foreign aid contributes to Tanzania's inflation rate stabilization. This hypothesis is based on endogenous growth theory (Romer, 1986; Lucas, 1988) as well as the findings of Guillaumont and Chauvet (2001) and Gomanee et al. (2005). Endogenous Growth Theory posits that economic growth is driven by factors such as technological progress, human capital accumulation, and efficient allocation of resources (Romer, 1986; Lucas, 1988). Foreign aid can enhance economic stability by supporting sound monetary policies, improving institutional quality, and increasing the supply of goods and services (Guillaumont & Chauvet,2001). Gomanee et al. (2005) found that aid allocated towards economic infrastructure and productive sectors can effectively control inflation in recipient countries.

Hypothesis H3: Foreign aid has a positive influence on Tanzania's external debt management. This hypothesis is grounded in public choice theory (Buchanan & Tullock, 1962) and the empirical evidence from Cordella et al. (2005) and Clements et al. (2004). Public Choice Theory suggests that well-managed foreign aid can improve governance and institutional quality by incentivizing policymakers to adopt sound economic policies and practices (Buchanan & Tullock, 1962). Cordella et al. (2005) found that aid inflows can reduce the risk of debt distress by providing concessional loans and grants, thereby lowering the cost of borrowing. Clements et al. (2004) also demonstrated that aid can support sustainable debt management practices by promoting economic growth and improving fiscal policies.

2.7 Previous Studies' weaknesses

Previous studies on the relationship between foreign aid and economic growth in Tanzania have faced several limitations. Many have focused on other developing regions rather than Tanzania specifically, and often rely on outdated data that do not reflect recent

economic changes, policy shifts, or evolving aid flows. Methodological weaknesses and narrow scopes have overlooked aid's broader effects on economic growth and human capital development. This study addresses these gaps by conducting a comprehensive econometric analysis tailored to Tanzania, extending the data range from 1988 to 2022. It adopts a multidimensional approach, examining foreign aid's impact on economic growth and human capital aspects such as education, health, infrastructure, and sector productivity. The study also considers policy implications and may include comparative analysis with similar countries to identify best practices. To overcome issues like endogeneity and reverse causality between aid and growth, it employs robust econometric techniques such as instrumental variables and dynamic panel data models. The analysis will also explore non-linear effects and diminishing returns, recognizing that excessive aid might reduce its effectiveness if a country cannot absorb it efficiently. This holistic and updated approach aims to provide nuanced insights into optimizing foreign aid for Tanzania's sustainable development.

FOREIGN AID ON TANZANIA ECONOMIC GROWTH

3.1 An overview of Tanzania's Economic growth

This analysis provides a detailed overview of Tanzania's economic performance from independence in 1961, highlighting four key policy phases: the early market economy (1961–1966), the Ujamaa socialist era (1967–1985), neoliberal reforms (1986–2005), and poverty reduction efforts since 2000. Initially reliant on agriculture, which accounted for 59% of GDP in 1961, Tanzania sought industrialization through foreign investment and development plans, although challenges like market failures and rising poverty persisted. Recent decades have seen robust economic growth, with real GDP averaging 5.5% annually from 2012 to 2021, making Tanzania one of Africa's fastest-growing economies despite a COVID-19-induced slowdown. The economy is diversified across agriculture (27%), industry (31%), and services (42%), with key sectors like mining and tourism showing recovery signs. Inflation has remained moderate and is expected to stabilize further. Per capita income and poverty rates improved significantly between 2004 and 2017, though growth slowed after 2015, with projections indicating a slight decline in 2022. Economic growth is forecasted to continue rising, reaching its potential rate of around 6% by 2025, supported by ongoing reforms, investment, and improved competitiveness.

Tanzania's 2022 economic growth was $75.71 billion, a 7.15% increase from 2021. In 2021, growth was $70.66 billion, up 6.94% from 2020. In 2020, growth was $66.07 billion, up 8.26% from 2019. In 2019, growth was $61.03 billion, up 7.06% from 2018. GDP growth rate (2022): 4.56%; Tanzania's nominal (current) Gross Domestic Product (GDP) is $75,709,289,056 (USD) as of 2022. Tanzania's GDP per capita was $1,025 in 2022. It has a population of 65,497,748. This is up $15 from $1,009 in 2021, a 1.5% rise. In 2022, the GDP growth rate was 4.56%, representing a change of 2,925,277,807 US dollars over 2021, when real GDP was $64,178,592,830. When adjusted for inflation, Tanzania's real GDP will be $54,061,415,302 in 2022.

Table 1: Tanzania GDP (Nominal, USD, GDP change (%)) from 2018-2022 (Source: World Bank, United Nations)

Year	GDP Nominal (Current USD)	GDP Real (Inflation)	GDP Change	GDP per capita	Pop Change	Population
2018	$57,003,686,049	$57,011,861,861	5.46%	$981	3.24 %	58,090,443
2019	$61,026,765,850	$60,318,549,849	5.80%	$1,007	3.07 %	59,872,579
2020	$66,068,737,757	$61,520,074,013	1.99%	$997	3.06 %	61,704,518
2021	$70,655,628,141	$64,178,592,830	4.32%	$1,009	3.05 %	63,588,334
2022	$75,709,289,056	$67103,870,637	4.56%	$1,025	3.00 %	65,497,748

The figure showing Tanzania's GDP trends from 1988 to 2022 highlights fluctuations with an initial dip in the early 1990s, followed by steady growth until around 2015, and volatility thereafter, including a decline around 2020 before recovery signs. Between 1985 and 2000, Tanzania heavily depended on foreign aid amid economic challenges and debt crises, with Structural Adjustment Programs aiming for liberalization but limited growth due to weak governance. From 2000 to 2010, economic reforms and debt relief under the HIPC Initiative improved stability and growth, supported by aid in health, education, and infrastructure. Between 2010 and 2020, increased domestic revenue and economic diversification lessened aid dependence, shifting aid toward capacity-building and industrialization. From 2020 to 2025, Tanzania has embraced economic self-reliance with major infrastructure projects fueling growth, further reducing foreign aid reliance while strengthening trade and attracting foreign investment. Overall, foreign aid was

crucial in Tanzania's early development, but the country is increasingly focusing on sustainable growth through improved governance, local investment, and regional trade.

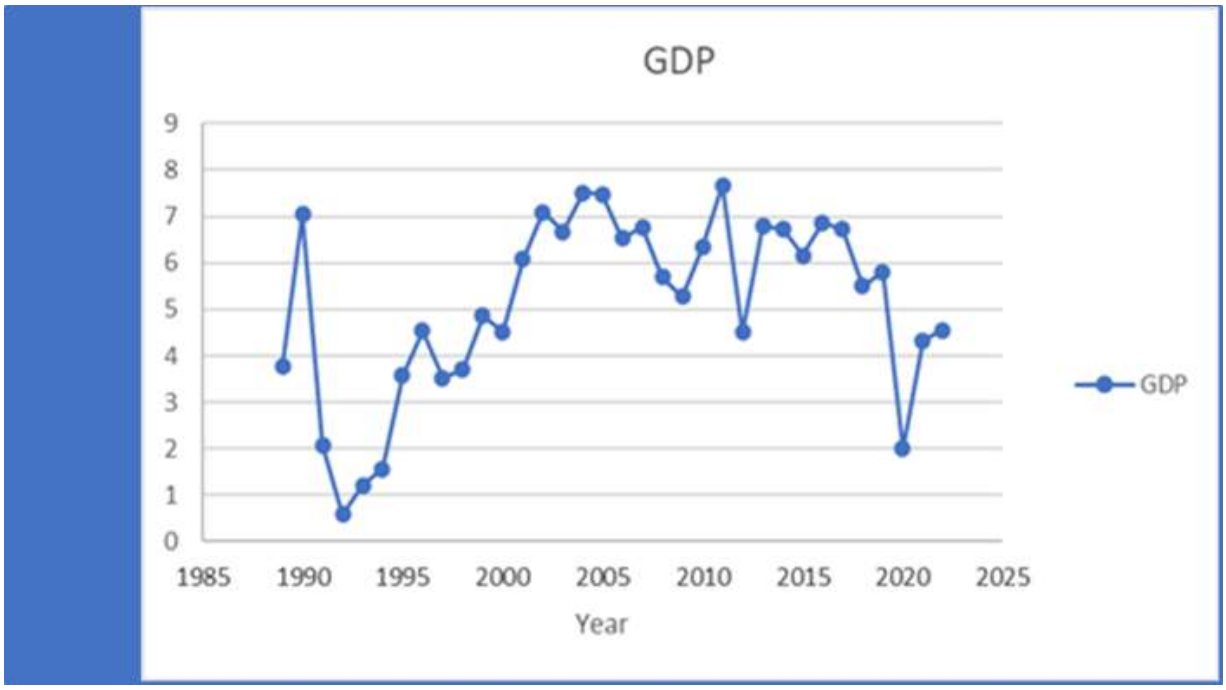

Figure 3: Trends in GDP for the period 1988-2022 in Tanzania

RESEARCH METHODOLOGY

This study employs a time series research design to collect, measure, and analyze consistent variables over the period 1988 to 2022 in Tanzania, focusing on the impact of foreign aid on economic growth. Using a positivist research paradigm, the study applies deductive reasoning to develop and test hypotheses through empirical data analysis. Time series analysis allows researchers to observe social behavior patterns and fluctuations in key factors such as exchange rates, foreign debt, and inflation over time. This approach is essential due to the large number of data points required to track trends and establish relationships between foreign aid and economic development, providing a rigorous and systematic scientific examination of the variables involved.

4.1 Models

The ARDL model

The ARDL model is a type of least-squares regression. It uses regressors based on lagged study variables. This analysis will employ the methodology described by Greene (2008). ARDL is a key technique in cointegration analysis. It examines how dependent and independent variables relate over time in equilibrium. Emeka and Kelvin (2016) noted this. In econometrics, cointegration represents a long-term equilibrium among economic variables over time. Scholars such as Engle-Granger (1987) and Johansen (1988) provided ARDL examples. Johansen-Juselius (1990), Saikkonen and Lutkepohl (2000), and Pesaran et al. (2001) were also involved. In a cointegrating relationship, the examples show non-stationary, integrated variables. We analyze the effect of foreign aid on a nation's economy. We use two independent variables: foreign exchange and foreign debt. We include these variables in a theoretical regression model. This model also includes the two-gap and three-gap models. Theoretical. Barro (1990) proposed the theoretical hypothesis. This theoretical hypothesis serves as the foundation for the model used in our investigation. People depict foreign aid as a transfer of money. It comes from other nations and goes to recipient countries. According to Barro's theory, productive investments can be private or government-funded. Both types contribute to production and growth. This is further expressed in Equation 1 below.

$y=f$ (x, y) ……..……...……. (1)

In the equation, x denotes private capital. Y is a function that includes all productive public spending in the domestic economy. Government taxes and some foreign aid cover this public expense. This can be expressed in the following manner:

$y=\rho f$ (x, y) ……...……..… (2)

The study examines the link between foreign aid and economic growth. It focuses on Tanzania. It looks at an ideal fiscal policy framework. This study has one goal. Its purpose is to investigate how foreign aid affects Tanzania's economic growth. It examines the context of an ideal fiscal policy. The study also aims to look at other elements that impact both growth and the flow of international aid. Both policy and aid have an impact on growth at different times. Dalgaard, Hansen, and Tarp (2003) stressed that they matter in very nonlinear ways. They interconnect. So, long-term production growth depends on foreign aid.

$$GDP_t = \sum_{i=1}^{n} \alpha_i FAID_{t-i} + \sum_{j=1}^{n} \beta_j FAID_{t-j} + \mu_{1t} \text{---------- (4-7)}$$

$$FAID_t = \sum_{i=1}^{n} \lambda_i FAID_{t-i} + \sum_{j=1}^{n} \beta_j GDP_{t-j} + \mu_{2t} \text{---------- (4-8)}$$

The above equation will test the null hypothesis. It says that there is no causal link between foreign aid and gross capital per person. Assume that there is no correlation between disturbances u1 and u2. We are discussing bilateral causation. This is because two variables are involved. We will cover this in the chapters on time series econometrics (VAR). We will use the vector autoregression approach to study multivariate causation. The estimated coefficients on the lagged M in equations (4–7) may not be zero. If so, it means that the relationship between FAID and GDP is one-way. The GDP in equations (4–8) is not different from zero. The lagged FAID coefficients in equations 4–7 are not different from zero (αi = 0). Then, GDP causes FAID. The same is true if the lagged GDP coefficients in equations 4–8 are not zero. And so on.

Pearson's Correlation Model

The Pearson Correlation Coefficient is the statistical measure used in the analysis. It was developed by Karl Pearson in the late 19th century. The analysis found many important linear relationships. It used Pearson's correlation coefficients on logged economic data. Foreign aid (LNFAID) and gross domestic product (LNGDP) have a notable, positive correlation. This suggests that countries that provide more aid have higher GDPs. This correlation might show how foreign aid affects a country's economy. It impacts its size. Also, GDP and the exchange rate (LNEXR) correlate. This means that the exchange rate rises. It often happens with strong economies. GDP also has a strong link with population (LNPOP). Larger populations may offer bigger markets or more labor. They are correlated with higher GDPs. In contrast, the exchange rate and inflation rate (LNEXR and LNINFR) exhibit a negative correlation, where a higher exchange rate tends to coincide with lower inflation rates, possibly reflecting the impact of a strengthening currency. Lastly, the inflation rate and debt (LNINFR and LNDebt)also show a negative relationship, suggesting higher debt levels might correlate with lower inflation, an insight thatcan have various economic implications, including the effects of fiscal policies on inflation rates. While these correlations indicate strong linear associations, it's important to note that connection does not imply causation. These insights provide a basis for further exploration and in-depth analyses to understand the underlying economic dynamics.

4.2 Empirical Tests

To analyze the impact of foreign aid on Tanzania's economic growth, various researchers, such as Burnside and Dollar (2000), Clemens et al. (2002), Juselius et al. (2014), Conchesta (2008), Chong et al. (2010), Arndt and Jones (2015), and Ramadhan (2016), conducted empirical studies that influenced the development of an appropriate economic model. Inflation, exchange rates, and external debt were selected as variables, with the availability of reliable data playing a crucial role in their selection. The baseline model is as follows: When estimating the foreign aid attributes from the time series of cross-country data using equation (1), there are some technical difficulties. The most problematic methodological situation arises when there is a connection between the factors impacting foreign aid and disturbances unique to a particular nation. To overcome the challenge, one can eliminate the time-variant disturbance by differencing the equation. However, the process as a whole might run into more problems. These could be fixed by creating a new OLS estimator that combines the level and first difference specifications by using the variables' lagged levels as tools for the first difference specification.

Unit Root Test

In this study, the unit root test is used to see if the variables in the model are stationary. This means that the mean, variance, and covariance of each variable used in the model should stay the same over time. This is important because the variables are time series variables, which are created by a stochastic process. The Augmented Dickey-Fuller (ADF) unit root test is used. If the absolute ADF value is greater than any of the absolute McKinnon critical values, a variable is stationary.

H1: δ = 0(unit root; the time series under consideration is not stationary).

H2: δ < 0((The time series under consideration is stationary.) H2:

The level of significance (α) is 5%. Rules for making decisions: If the absolute value of the ADF statistics is higher than any of the McKinnon critical values in absolute terms, then hypothesis H1 should be rejected. Otherwise, we do not reject the proposal.

Testing for Co-Integration

Co-integration evaluates how variables move toward each other. When examining time series data, independent variables can move in the same direction, even if the dependent variable moves independently. When independent variables move in sync, multiple regressions become less valuable because they may have the same impact on the dependent variable. However, if the independent variables and the dependent variables co-integrate, multiple regressions can still be useful. Therefore, it was important to first measure the co-integration of the variables before carrying out multiple regressions while the research was being conducted. The results of the co-integration test shed light on whether or not the time series data are in equilibrium in the long run. These are the

findings. The results of the co-integration test indicate whether the time series data are in long-term balance. These results suggest that a combination of non-stationary individual variables could still be stable. By demonstrating a co-integration between several important variables, the results of the research provided evidence in favor of the rejection of the null hypothesis. The GDP, the exchange rate, the inflation rate, and the foreign debt logs were all included. Two conditions must be met for co-integration to occur: either all of the series must have a deterministic trend or all of the variables must be integrated in the same order (at first difference) (Granger, 1986). Co-integration is the statistical result of a long-term relationship between variables that are not stationary when looked at on their own but become stationary when differences are taken into account (Gujarati, 1995). Therefore, the co-integration test is important to determine if the variables have a long-term relationship. Following that, the Johansen test for co-integration was performed to determine whether the variables under consideration were co-integrated or not (Johansen, 1988).

$$\Delta Y_t = \beta_0 + \Delta\beta_{1t} + \Sigma_{i=1}^{n}\beta_i \Delta Y_{t-i} + \varepsilon_t \text{---------- (4-9)}$$

$$\Delta\mu_t = \beta_0 + \Delta\beta_{2t} + \Sigma_{i=1}^{n}\beta_i \Delta\mu_{t-i} + \varepsilon_t \text{---------- (4-10)}$$

where:
μ = error term
Δ = change
E = model residual term
The decision rule states that if the error term is co-integrated at level form only using augmented Dickey-Fuller, a long-run relationship exists.

Model justification
Given the wide range of regression models available, this study will employ the ordinary least squares (OLS) approach, as it is the most suitable for this type of analysis. The ordinary least squares technique is used in regression analysis, mainly because it is technically a lot easier to understand and intuitively more attractive than any other econometric method (Gujarati and Porter, 2013). Due to its favorable statistical qualities of linearity, unbiasedness, and efficiency in the class of unbiased estimators, this approach, which is attributed to Carl Gauss, is favored. This has made it one of the most effective and well-liked estimating strategies (Gujarati and Porter, 2013). Gujarati and Porter (2013) listed the assumptions guiding the classical linear regression model as follows: The regression model has linear parameters, fixed x values in repeated samples, a zero-mean value of stochastic disturbances, homoscedasticity or constant variance, and no autocorrelation between the disturbances.

The augmented Dickey-Fuller (ADF) test
The Augmented Dickey-Fuller (ADF) test is used to determine whether a variable follows a unit-root process. This method can also determine that the variable was produced by a stationary process, thereby rejecting the null hypothesis of a unit root. Including lagged values in the regression, along with the choice of adding a trend term or excluding a constant, can be an option. Dickey and Fuller (1979) developed a technique to identify a random walk or a unit root. Hamilton (1994) outlines four scenarios covered by the ADF test. The null hypothesis is that a variable has a unit root. According to the null hypothesis, the inclusion of a drift factor, along with a constant term and temporal trend in the regression, causes divergence. Becketti (2013) presents additional examples of conducting these tests. We believe that this model is the most accurate. The first equation represents a random walk without drift. The second equation depicts a random walk that may incorporate a drift. It must be independently and identically distributed, with a mean of 0and a variance of 0. The t-statistic is the test statistic used to test the unit root hypothesis.
If the calculated t-value of the coefficient is greater than the critical value, then the null hypothesis that there is a unit root is accepted, implying that it is non-stationary. But if the computed t-value is less than the critical value, we strongly reject the null hypothesis and accept the alternative hypothesis that there are no unit roots, implying that the series is stationary (Dickey, 1981). In Equation (9), the OLS t-statistic is equivalent to the ADF statistic, testing α as an unknown coefficient. It is possible to ascertain the lag duration by using either the BIC or the AIC. According to Stock and Watson (2007), the ADF statistic does not adhere to a normal distribution, even though it encompasses larger sample sizes.

Variables
This study examines key economic variables impacting Tanzania's growth, focusing on foreign aid (Official Development Assistance, ODA), inflation rate, exchange rate, and external debt. ODA, as defined by the OECD, represents concessional public-sector assistance aimed at promoting economic growth. Inflation reflects rising prices that reduce money value and negatively affect productivity, investment, and growth. The exchange rate's proper management is crucial for maintaining economic stability, with evidence linking balanced currency valuation to positive growth outcomes. External debt can either stimulate growth when invested productively or impose long-term burdens through increased interest rates and reduced private capital, as noted by economists like Modigliani and Meade. The study investigates how foreign aid influences these variables and their combined effect on GDP growth,

emphasizing the complex interplay between resource availability, capital formation, technology, and institutional factors in shaping Tanzania's economic development.

Table 2: Definition of Variables, Expected sign, and Data source

S/N	Variables Names	Parameter	Explanation	Data Source	Expected sign
1	LNFAID	β1 ODA	Log of ODA is a form of foreign development aid-financed solely by grants and concessional loans from both bilateral and multilateral institutions.	The Organization for Economic Co-operation and Development (OEC).	+
2	LNGDP	β2 GDP	Log of GDP. Itis calculated at a fixed rate of the nation.	Bank of Tanzania (BOT)	+
3	LNEXR	β3 EXR	Log of exchange rate. It measures the macroeconomic stability of the country.	World Bank	+
4	LNINFR	β4 INFRA	Log the inflation rate. It assesses the country's economic stability by determining the general price level of goods and services in the economy.	Bank of Tanzania (BOT)	+
5	LNDEBT	B5 DEBT	Log of external debt. Record of foreign debts, which encompasses internal debts and the overall government debt.	World Development Indicators	+

EMPIRICAL RESULTS AND DISCUSSIONS

This section discusses the results obtained and how they relate to each specific goal. Data gathered from 1988 to 2022 was examined using Stata Version IC15. We used Stata Version IC15 to generate descriptive statistics and perform multiple regressions. This analysis provided insights into the relationship between the independent variables (inflation, external debt, and exchange rate) and the dependent variable (economic growth). The DF and ADF tests' outcomes were obtained. We conducted the tests with the intercept and without the trend. The ARDL test was also used to compare co-integration with and without the intercept and trend. The chapter discusses error correction estimation, Granger causality, and diagnostic and parameter stability findings.

5.1 Data

The study used publicly available secondary annual time series data for Tanzania from 1988 to 2022. The data was sourced from the World Bank, the Development Indicator (WDI), and the United Nations Data Base. The lack of data prevented the time frame from being extended beyond 2022. In this chapter, the research outcomes are outlined, examined, and evaluated to align with the study's objectives. For validation purposes, the corresponding hypotheses are also tested using economic, statistical, and econometric methods. Foreign aid (FAID), external debt (DEBT), inflation (IFNR), real growth domestic product (GDP), and exchange rate (EXR) are the variables analyzed in this study, with only the natural logarithm of real GDP (GRPC) being transformed. The graph illustrates the trends in Tanzania's foreign aid (in millions of USD) and GDP (in billions of USD) from 1988 to 2022, showing significant fluctuations in foreign aid and a steady upward trend in GDP. Notable peaks in foreign aid, particularly in the early 2000s, 2007, 2009, and 2013, coincide with international initiatives like the Millennium Development Goals and major donor-funded projects, while declines reflect changing global aid dynamics. In contrast, Tanzania's GDP grew consistently from approximately 5.1 billion USD in 1988 to 75.7 billion USD in 2022, driven by economic reforms, investment in key sectors, and a stable political environment. This relationship suggests that while foreign aid plays a role in economic development, domestic policies, investments, and reforms are crucial for sustained economic growth. The trends highlight that, despite fluctuations in aid, Tanzania's economy continued to expand, underscoring the importance of a diversified approach to economic development. This analysis supports the thesis by demonstrating that foreign aid, though significant, is one of many factors influencing Tanzania's economic growth, necessitating comprehensive policies that leverage assistance effectively while promoting self-sustained growth.

Figure 4: Trends in foreign aid and GDP in Tanzania ***(Source: Foreign Aid and GDP in Tanzania (1988-2022)***

5.2 Descriptive Statistics

Descriptive statistics from 35 observations between 1988 and 2022 reveal varying trends in foreign aid, inflation, external debt, exchange rates, and GDP in Tanzania. Studies primarily used GDP and GDP per capita to measure economic growth, analyzing key factors such as net official development assistance (ODA) per capita, foreign direct investment (FDI), and trade balance. Results generally show a positive and significant relationship between net ODA and economic growth, with FDI also contributing beneficially. However, high debt service levels negatively impacted growth and national savings. Aid effectiveness varied over time, being stronger during infrastructure-focused periods from the mid-1970s to early 1990s and improving further with sound macroeconomic policies and budget support in the mid-1990s. Foreign aid fluctuated widely, influenced by global economic trends and policy changes. While some researchers found foreign aid had minimal impact or even hindered growth due to poor management, others argued it could promote growth without prerequisites. Structural adjustment programs and government initiatives aimed to stabilize the economy but often fell short in reducing poverty. Overall, the literature suggests that foreign aid benefits Tanzania's economy most when combined with good governance, high domestic savings, investments, and effective policy implementation.

Table 2: Descriptive Statistics

variable	No of observation	mean	min	max	Sd	Skewnesss	KUrtosis	Sd.Error
LNFAID	35	21.239	.20.580	21.957	.459	0.554	0.000	0.129
LNGDP	35	23.619	22.172	25.050	.975	0.066	0.239	30.669
LNEXR	35	6.818	4.598	7.753	.841	0.524	0.021	55.938
LNINFR	35	2.240	1.190	3.578	.759	0.011	0.906	28.921
LNDEBT	35	19.338	18.088	21.408	.902	0.000	0.003	1.164

5.3 Correlation Coefficients

The analysis examined the pairwise correlations among key variables, revealing several notable relationships. The log of net foreign aid (LNFAID) shows a strong positive correlation (0.879) with the log of GDP (LNGDP), indicating that higher foreign aid levels are associated with greater economic growth in Tanzania. LNFAID also correlates moderately with the log of exchange rate (LNEXR) at 0.488 and the log of debt (LNDebt) at 0.309, suggesting aid inflows relate to exchange rate fluctuations and debt levels. LNGDP positively correlates with both LNEXR (0.511) and LNDebt (0.554), implying GDP growth aligns with exchange rate movements and debt. In contrast, the log of inflation rate (LNINFR) has a strong negative correlation with LNGDP (-0.821) and LNEXR (-0.829), highlighting inflation's detrimental effect on growth and exchange rates. Interestingly, LNINFR negatively correlates with LNDebt (-0.418), suggesting high inflation periods coincide with lower debt levels. The exchange rate and debt levels rise together, emphasizing their intertwined dynamics, while inflation negatively correlates with most economic indicators and time, potentially reflecting effective policies countering inflation as the economy grows. Debt's moderate positive correlation with GDP and weaker correlation with foreign aid indicates a complex relationship. Overall, these correlations illustrate the multifaceted interactions among foreign aid, economic growth, inflation, exchange rates, and debt in Tanzania, though causality should not be inferred solely from these associations.

Table 3: Pairwise correlation coefficient

VARIABLES	LNFAID	LNGDP	LNEXR	LNINFR	LNDebt
LNFAID	1.000				
LNGDP	0.879	1.000			
LNEXR	0.488	0.511	1.000		
LNINFR	-0.611	-0.821	-0.829	1.000	
LNDebt	0.309	0554	0.447	-0.418	1.000

5.3 Estimation Results

The study utilized inferential statistics, including unit root tests, to analyze data from 1988 to 2022 on inflation, external debt, foreign exchange, and economic growth in Tanzania, testing hypotheses on the impact of each variable. The data showed non-normal distribution, with external debt and inflation exhibiting negative skewness. Studies revealed that net Official Development Assistance (ODA) per capita positively and significantly correlates with GDP growth, with foreign direct investment (FDI) also benefiting economic expansion. Aid effectiveness varied over time, improving in the mid-1990s following sound macroeconomic policies and the shift to General Budget Support, while high debt service and inefficient public spending hindered growth. Descriptive statistics from 1990–2004 showed mean net ODA at 21.24% of GNI, mean GDP growth at 23.62%, mean inflation at 2.24%, and mean debt at 19.34% of GNI, framing the macroeconomic context. Unit root tests indicated that variables like LNGDP became stationary after differencing, while LNEXR showed stationarity at level. The study used ARDL modeling to capture dynamic relationships among logarithmic transformations of economic indicators, selecting optimal lag orders based on information criteria (AIC, HQIC, SBIC) and forecasting accuracy (FPE), with lower criterion values indicating better model fit and predictive power.

Table 4: Augmented Dickey-fuller Test

variable	T-statistic (level)	P-Value (level)	T-statistic first Difference	P_value first difference	Order of integration
LNFAID	-1.133	0.701	-4.922	0.000***	I (1)
LNGDP	0.067	0.963	-3.833	0.002**	I (1)
LNEXR	-7.573	0.000	-3.199	0.020*	I (0)
LNINFR	-1.497	0.534	-4.945	0.000***	I (1)
LNDebt	0.639	0.988	-4.234	0.000***	I (1)

This table presents the statistical performance of each variable in the model, including log-likelihood (LL), likelihood ratio (LR), degrees of freedom (df), p-value, final prediction error (FPE), Akaike information criterion (AIC), Hannan-Quinn information criterion (HQIC), and Schwarz Bayesian information criterion (SBIC). The optimal lag reflects the number of significant past values used to predict the current value. LNFAID (Log of Foreign Aid) has an optimal lag of 1, with a high LR of 60.537 and a p-value of zero, indicating a statistically significant effect on the economy; its negative AIC, HQIC, and SBIC values suggest it improves model fit. LNGDP (Log of GDP) shows an even higher LR of 135.99 and a zero p-value, also with negative information criteria, underscoring its strong explanatory power. LNEXR (Log of Exchange Rate) has a lower LR of 3.5858 and a p-value of 0.058, just shy of significance, with an optimal lag of 2; it has the most negative information criteria values, showing high model confidence. The first difference of LNEXR (D. LNEXR) has an LR of 17.678 and zero p-value, a lag of 1, and the lowest FPE, indicating strong predictive ability. LNINFR (Log of Inflation Rate) and LNDebt (Log of Debt) differ by having positive AIC, HQIC, and SBIC values but maintain zero p-values, meaning they remain important in the analysis. Overall, foreign aid and GDP stand out as key variables, with exchange rate and its changes playing vital roles, while inflation and debt contribute uniquely to Tanzania's complex economic story.

Table 5: Lag length selection

Variable	LL	LR	Df	p-value	FPE	AIC	HQIC	SBIC
LNFAID	11.482	60.537	1	0.000	0.031	-0.611	-0.581	-0.519
LNGDP	27.969	135.99	1	0.000	0.010	-1.675	-1.645	-1.582
LNEXR	46.362	3.5858	1	0.0580	0.003	-2.797	-2.752	-2.658
D.LNEXR	44.987	17.678	1	0.000	0.003	-2.865	-2.835	-2.772
LNINFR	-5.1461	51.728	1	0.000	0.092	0.461	0.491	0.553
LNDebt	-4.7050	74.487	1	0.000	0.090	0.432	0.462	0.525

The graph visually presents the Likelihood Ratio (LR) values for key economic variables, illustrating their predictive power on the country's economy. LNFAID, representing the natural logarithm of foreign aid received, shows a strong LR of about 60.54,

indicating significant influence. LNGDP, the natural logarithm of GDP, stands out with the highest LR of 135.99, making it the most significant predictor. LNEXR, the natural logarithm of the exchange rate, has a modest LR of 3.59, while its first difference, D_LNEXR, is higher at 17.68, reflecting changes in exchange rate impact. LNIMFR, possibly relating to International Monetary Fund resources or relations, has an LR of 51.73, indicating considerable importance. Lastly, LNdebt, the natural logarithm of national debt, shows a strong LR of 74.49, highlighting its substantial role. The varying heights of the bars correspond directly to each variable's influence on Tanzania's economic outcomes, with GDP and debt being among the most impactful factors.

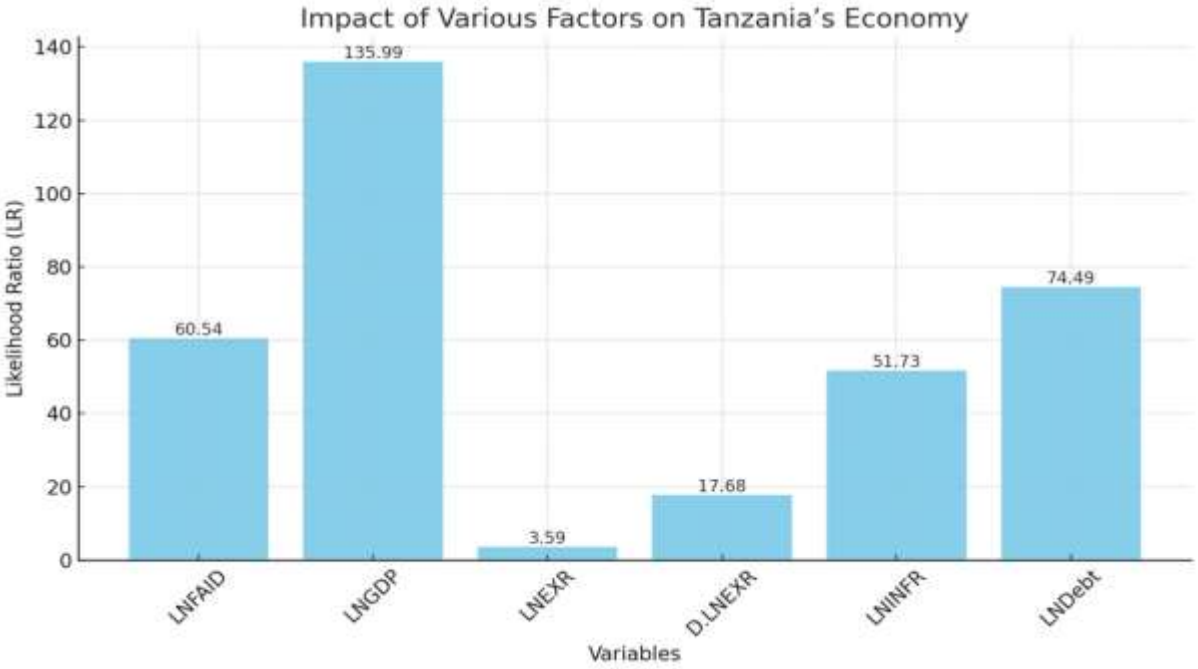

Figure 5: Impact of Various Factors on Tanzania's Economy

The table reveals a significant negative short-term relationship between inflation and GDP growth, indicating that high inflation erodes purchasing power and hampers economic expansion. Conversely, debt from previous periods shows a positive impact on current GDP growth, with coefficients of 0.140757 (p=0.023) and 0.1996535 (p=0.005) for debt lagged one and two periods respectively, both significant at the 5% level. This suggests that borrowing may be effectively used to finance growth-enhancing investments. While foreign aid did not show a significant effect on GDP growth in this study, other factors like past GDP performance, exchange rate fluctuations, inflation, and debt levels are important. Negative coefficients for exchange rates and inflation highlight the critical role of macroeconomic stability in fostering growth. The positive influence of debt underscores the importance of its productive utilization for economic development. Overall, the findings emphasize that beyond foreign aid, sound management of macroeconomic variables is vital for Tanzania's economic progress.

Table 6: ARDL (4,1,4) Model Analysis for Tanzania's Economic Growth

REGRESSOR	COEFFICIENT	STDERROR	T-RATIO	PROB.	SIGNIFICANCE
LNGDP L1	0.022	0.129	0.17	0.864	
LNFAID	6.245	30.669	0.20	0.842	
LNEXR	10.668	55.938	0.19	0.852	
LNINFR	-5.230	28.921	-0.18	0.859	
LNDEBT	0.041	1.164	0.04	0.972	
LNGDP LD	-0.327	0.203	-1.61	0.131	**
LNGDP L2D	-0.626	0.214	-2.92	0.012	
LNGDP L3D	-0.311	0.146	-2.12	0.054	*
LNFAID D1	-0.105	0.079	-1.32	0.210	
LNEXR D1	-1.305	0.228	-5.71	0.000	***
LNEXR LD	-0.524	0.250	-2.09	0.057	*
LNEXR L2D	-0.795	0.241	-3.30	0.006	**
LNEXR L3D	-1.009	0.250	-4.02	0.001	***
LNDEBT LD1	-0.168	0.050	-3.30	0.006	**
LNINFR D1	0.140	0.054	2.57	0.023	**

LNDEBT LD	-0.095	0.049	-1.94	0.074	*
LNDEBT L2D	0.199	0.058	3.40	0.005	**
_CONSTANT	4.437	1.391	3.19	0.007	**
TREND • R-SQUARED: 0.919 • ADJ R-SQUARED: 0.813 • LOG-LIKELIHOOD: 66.710 • ROOT MSE: 0.043					

5.4 Causality Test

The Granger causality analysis reveals several key relationships influencing Tanzania's economic growth (LNGDP). Past values of the exchange rate (LNEXR) and foreign debt (LNDebt) exhibit strong unidirectional causality toward GDP, indicating they significantly predict economic growth. Foreign aid also shows a significant causal impact on GDP, suggesting that past aid inflows contribute to economic expansion. Infrastructure (LNINFR), while showing some unidirectional causality, lacks statistical significance, making its influence inconclusive. Combined analysis of all variables confirms a significant joint effect on GDP growth. Notably, the inflation rate does not display a significant causal link with GDP, implying inflation fluctuations may not reliably forecast economic growth in Tanzania. The findings highlight foreign aid, exchange rates, and debt as crucial drivers of economic trends, whereas inflation appears less influential in this context. These insights provide valuable guidance for policymakers aiming to design strategies that foster sustainable long-term growth by focusing on stabilizing exchange rates, managing debt effectively, and optimizing foreign aid utilization.

Table 7: Causality Test

CAUSE	EFFECT	TYPE OF CAUSALITY	SIGNIFICANCE
LNGDP	LNEXR	Unidirectional	***
LNGDP	LNINFR	No Significant Causality	
LNGDP	LNDebt	Unidirectional	***
FOREIGN AID	LNGDP	Unidirectional	***
FOREIGN AID	LNEXR	Unidirectional	***
FOREIGN AID	LNINFR	Unidirectional	***
FOREIGN AID	LNDebt	Unidirectional	***
LNEXR	LNGDP	Unidirectional	***
LNEXR	LNINFR	Unidirectional	***
LNEXR	LNDebt	Unidirectional	***
LNINFR	LNGDP	Unidirectional	***
LNINFR	LNEXR	No Significant Causality	
LNINFR	LNDebt	Unidirectional	***
LNDEBT	LNGDP	No Significant Causality	
LNDEBT	LNEXR	Unidirectional	**
LNDEBT	LNINFR	Unidirectional	***

5.5 Vector Autoregression

Vector autoregression (VAR) is a flexible, data-driven model that captures the dynamic interdependencies among multiple time series variables, generalizing the single-variable autoregressive model to a multivariate context. The regression analysis table provides insights into the optimal lag lengths, model fit, and statistical significance of key variables affecting Tanzania's economy. For LNGDP (log of GDP), the optimal lag is 1, with a very low RMSE of 0.068 and an exceptionally high R-squared of 0.998, indicating the model explains 99.8% of the variance in GDP. The Chi-squared value of 3742.127 (p=0.000) confirms strong significance. Foreign Aid has an optimal lag of 2, a higher RMSE (1.5e+08), but a strong R-squared of 0.988, with a significant Chi-squared of 3.5858 (p=0.000), showing it as an important predictor. LNEXR (exchange rate) with lag 1 has a RMSE of 0.030 and significant Chi-squared of 17.678, though the R-squared seems typographically misstated but suggests good fit. LNINFR (inflation rate) and LNDebt (debt) each have optimal lag 1, with RMSEs of 0.199 and 0.269, and R-squared values of 0.970 and 0.973 respectively, both highly significant with Chi-squared values 51.728 and 74.487 (p=0.000). Overall, all variables show strong, statistically significant relationships within the VAR framework, supporting their roles in explaining Tanzania's economic dynamics.

Table 8: Vector Autoregression

Variable Optimal Lag	RMSE	R-sq	Chi2	p>chi2
LNGDP 1	.068	0.998	3742.127	0.000
Foreign Aid 2	1.5e+08	0.988	3.5858	0.000
LNEXR 1	.030	07.999	17.678	0.000
LNINFR 1	.199	0.970	51.728	0.000
LNDebt 1	.269	0.973	74.487	0.000

CONCLUSION AND POLICY IMPLICATIONS

6.1 Conclusion

This study offers a thorough analysis of how foreign aid, inflation rate, exchange rate, and external debt influence economic growth in Tanzania from 1988 to 2022 using robust time series econometric methods. The results confirm a significant positive relationship between foreign aid and Tanzania's economic growth, highlighting foreign assistance as a key driver of development. Additionally, inflation, exchange rates, and external debt also positively impact growth, emphasizing the need for policymakers to adopt integrated economic policies that consider the interplay among these factors. The study suggests that for foreign aid to maximize its growth potential, it should be aligned with national development priorities, supported by stable macroeconomic policies to control inflation and exchange rates, and that external debt should finance productive investments. Foreign aid can also aid in inflation control by boosting supply or backing monetary stability, while concessional loans reduce borrowing costs, facilitating growth-oriented projects. This research advances understanding of the complex aid-growth relationship in Tanzania and offers practical policy guidance for optimizing aid effectiveness, providing valuable lessons for Tanzania and other developing countries aiming for sustainable economic progress.

6.2 Policy implication

The study analyzing the impact of foreign aid, inflation, exchange rates, and external debt on Tanzania's economic growth from 1988 to 2022 highlights foreign aid as a vital growth driver, though its overall economic impact remains somewhat ambiguous. The relationship between national debt and growth is nuanced: moderate debt can fund productive investments, while excessive debt increases financial burdens through interest payments. Macroeconomic factors like exchange rate stability and inflation significantly influence growth, emphasizing the need for consistent policy frameworks. The study's policy recommendations urge improving the efficiency and long-term benefits of foreign aid by aligning it with national priorities and enhancing governance. It also calls for macroeconomic policies that stabilize exchange rates, inflation, and debt to foster a conducive growth environment. Additionally, prudent fiscal management, particularly regarding government spending on foreign aid, is essential to ensure resources are effectively allocated and deliver maximum developmental value.

6.3 Recommendation

The extensive research on foreign aid's impact on Tanzania's economic growth offers vital recommendations for researchers, policymakers, and development practitioners. Researchers are encouraged to replicate the study in comparable developing economies to validate findings and deepen insights into how foreign aid affects growth. They should also incorporate factors like governance quality, institutional capacity, and political stability to better understand aid's mechanisms and explore the varied effects of different aid types (project aid, budget support, technical assistance) for more effective allocation. Policymakers should prioritize macroeconomic stability by managing inflation and exchange rates and carefully evaluate borrowing to ensure debt-financed investments align with national development goals. Strengthening domestic resource mobilization, such as improving tax systems, can reduce aid dependency and promote sustainability. Development practitioners must ensure aid aligns with recipient countries' priorities rather than donor interests, focus on building local institutional capacity, and foster public-private partnerships to enhance aid's impact. Together, these strategies highlight the importance of integrating foreign aid with domestic revenue generation and private sector growth to achieve sustainable, long-term development in Tanzania and similar countries.

List of abbreviation

ARDL: Autoregressive Distributed Lag
BOT: Bank of Tanzania
ADF; Augmented Dickey-Fuller

OLS: Ordinary Least Square
AU: African Union
ODA: Official Development Assistance
SADC: Southern Africa Development Cooperation
OECD: Organization for Economic Cooperation and Development
NEPAD: New Partnership for Africa`s Development
SAP: Structural Adjustment Programs
NBS : National Bureau of Statistics
NORAD : Norwegian Agency for Development
USA : United States of America
UNDP : United Nations Development Program
WDI : World Development Indicators
WB : World Bank
GBS : Government Budget Support
MOFP : Ministry of Finance and Planning
SAP : Structural Adjustment programs
SADC : Southern Africa Development Cooperation
MDG : Millennium Development Goals
GDP : Gross Domestic Product
NBS : National Bureau of Statistics
FDI : Foreign Direct Investments
DFID : Department for International Development

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