IMPACT OF INTERNATIONAL TRADE ON ECONOMIC GROWTH IN TANZANIA: 2001 - 2025

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A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE (ECONOMICS)

DEPARTMENT OF ECONOMICS AND COMMUNITY ECONOMIC DEVELOPMENT

OF THE OPEN UNIVERSITY OF TANZANIA

2025

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for the acceptance by the Open University of Tanzania, a thesis titled**: *"Impact of International Trade on Economic Growth in Tanzania: 2001 - 2020",*** in fulfilment of the requirements for the degree of Master of Science (Economics) of the Open University of Tanzania.

……..……

Dr. Felician Mutasa

(Supervisor)

……

Date

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DECLARATION

I, **Nassibu Richard Mwaifunga,** declare that the work presented in this dissertation is original and mine. It has never been presented to any other university or institution. Where other people's work has been used, references have been provided. It is presented in partial fulfillment of the requirement for the Degree of Master of Science in Economics of the Open University of Tanzania.

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Signature

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DEDICATION

I dedicate this thesis to all people and institutions which have supported me in conducting this research.

ACKNOWLEDGEMENTS

I extend my sincere gratitude to the Almighty God for the strength and good health during my academic journey. I am very gratitude to the committee members and the chair of my committee for their invaluable insights, constructive comments and feedback. Their support and expertise have been very crucial in enhancing the quality of this study. Also, I could not have conducted this study without the technical support from the lecturers of the Open University of Tanzania. I specifically thank my supervisor, Dr. Felician Mutasa, who generously shared his knowledge and expertise. In addition, this endeavor would be difficult to accomplish in the absence of the support I received from the Prime Minister's Office.

I am also grateful to my personal assistant, my cohort members, office mates, especially my personal secretary, for their backup in conducting and writing this thesis. I thank the research assistants, and study participants from the Open University of Tanzania, who enriched this study with data.

Lastly, I would be negligent if I won't mention my family, particularly my mother, my wife and children. They were a source of my inspiration and motivation to conduct this research.

ABSTRACT

This study examines the impact of international trade on the economic growth of Tanzania using quarterly time series data from 2001 to 2020. The research analyzes the effects of net exports, net imports, and exchange rate fluctuations on economic performance. The study employs econometric techniques, including the Autoregressive Distributed Lag (ARDL) model, Vector Autoregression (VAR), and Granger causality tests to determine both short-run and long-run relationships. Findings reveal that net exports have a significant positive effect on economic growth in the long run, while net imports and exchange rate depreciation negatively influence growth. The ARDL model, which is particularly suited for time series data with variables integrated at different orders, confirms that the economy adjusts back to equilibrium at a speed of 71% per quarter. The Bounds Test for Cointegration under the ARDL framework establishes a long-run relationship between trade variables and GDP growth. The Granger causality test establishes bidirectional causality between net exports and economic growth, indicating that exports drive GDP growth, while economic expansion further enhances exports. Net imports show a unidirectional causality with economic growth, implying that import changes significantly impact growth but not vice versa. The study further integrates the VAR model to analyze the short-term dynamics among trade variables, providing additional insights into the interplay between trade policies and economic fluctuations. Policy recommendations suggest that Tanzania should adopt export-led growth strategies, reduce import dependency through industrialization and import substitution, and stabilize the exchange rate through sound monetary policies. The study advocates for enhancing trade policies, improving infrastructure, and encouraging foreign direct investment (FDI) in key economic sectors to foster sustainable growth.

***Keywords**: Economic Growth, International Trade, Export, Import.*

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LIST OF ABBREVIATIONS AND ACRONYMS

ARDL	Autoregressive Distributed Lag
BOP	Balance of payment
COMESA	Common Market for Eastern and Southern Africa
EAC	East Africa Community
ECM	Error Correction Model
EPZA	Economic Processing Zone Authority
EPZ's	Economic Processing Zones
EU	European Union
EVCM	Error Vector Correction Model
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IMF	International Monetary Fund
JEDC	Jordan Export Development Corporation
JIB	Jordan Investment Board
MSME's	Micro, Small and Medium Enterprises
NBS	National Bureau of Statistics
NIC	National Investment Centre
OLS	Ordinary Least Square
SADC	Southern African Development Community
SEZ's	Special Economic Zones
SSA	Sub Saharan Africa
TNC's	Transnational Corporation

UK	United Kingdom
URT	United Republic of Tanzania
USA	United States of America
VAR	Vector Auto regression
VAT	Value Added Tax
VECM	Vector Error Correction Model
WDI	World Development Indicators

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.0 Chapter Overview

This chapter provides a comprehensive introduction to the study, focusing on the role of international trade in influencing global and national economic growth. It specifically examines Tanzania's trade policies, economic reforms, and the impact of trade liberalization on economic performance. The chapter outlines key issues surrounding trade liberalization, including the benefits and challenges faced by Tanzania in integrating into the global trade system. Furthermore, it highlights the rationale for the study by identifying gaps in the literature concerning the causal relationship between international trade and economic growth in Tanzania.

1.1 Introduction

International trade has become an integral part of the global economy, significantly influencing economic growth, productivity, and business activity. As nations engage in cross-border trade, they seek to maximize profits by importing and exporting goods and services, often aiming to achieve economic prosperity. Globally, the rise in international trade has been closely linked to increased productivity, improved business environments, and overall economic growth (Binos et al., 2023). For Tanzania, a developing nation in East Africa, international trade has played a crucial role in shaping its economic trajectory over the years.

Before the era of economic reforms and globalization, Tanzania's economy faced considerable challenges, struggling to thrive amid protectionist policies and inefficient trade management systems. According to Kanaan (2000), the Tanzanian economy suffered from deteriorating tax ratios, rising trade taxes, and delayed tariff reductions, which hampered trade activities and economic growth. However, the implementation of trade liberalization policies in the 1990s, alongside reforms aimed at improving tax and customs management, marked a shift toward a more open economic environment. These changes are evident in Tanzania's improved ranking on the International Monetary Fund (IMF) trade constraints index, which dropped from 10 to 6, signaling reduced trade restrictions.

Trade liberalization in Tanzania, particularly after the 1980s, contributed to the reduction of non-tariff barriers, which accounted for over 50% of imports during the 1980-1986 period. By 1999, significant progress had been made in reducing physical constraints at ports and lowering the tariff rate from a steep 40% to a more manageable 15-20%. These reforms, coupled with the elimination of nontariff barriers, laid the foundation for Tanzania's participation in global trade and were intended to stimulate sustainable economic growth.

Globalization, by enabling industries to specialize and focus on their comparative advantages, was seen as a key strategy for fostering economic development. The aim was to enhance Tanzania's GDP growth, attract foreign currency, and bolster industrial and technological advancements. However, despite these efforts, Tanzania faced significant challenges in improving its scientific and technological capacities, a

critical factor in achieving sustainable growth in the global economy. Throughout the 1980s, Tanzania experienced significant financial difficulties, including foreign exchange shortages, balance of payments crises, and declining export performance. These economic imbalances led to policy changes, such as the Economic Recovery Programme of 1996, which aimed to revitalize the export sector and liberalize import practices. The reduction of import tariffs, the introduction of an open general license system, and the removal of foreign exchange restrictions from 1988 to 1993 played an important role in the country's economic revival.

Despite these efforts, fiscal imbalances persisted, and customs duties were increased in the mid-1990s to address tax revenue shortfalls, leading to a slowdown in import activities. However, trade liberalization, coupled with macroeconomic stabilization policies, began to yield positive results. Exports grew steadily, foreign exchange restrictions were eased, and overall trade activities increased. Despite a decline in trade conditions in the early 1990s, Tanzania's trade policies allowed for greater engagement in international trade, contributing to gradual economic improvement.

1.2 Background of the Study

International trade has been widely recognized as a crucial driver of economic growth for many countries worldwide. It plays a pivotal role in increasing productivity, fostering business activity, and providing access to new markets and technologies. The growth of international trade in the modern world has facilitated greater economic integration, enabling nations to expand their economic opportunities. The relationship between international trade and economic growth has

been extensively studied at both global and regional levels, providing evidence that trade openness leads to improved economic performance, particularly in developing economies (Binos et al., 2023; Adedeji, 2006). Globally, the expansion of international trade has been associated with increased global productivity and business activities. Countries that have opened their borders to international trade have experienced higher growth rates, improved economic conditions, and reduced poverty levels. According to the World Bank (2022), countries that liberalized their trade policies have seen marked improvements in their Gross Domestic Product (GDP), driven largely by export activities. The liberalization of trade barriers, including the reduction of tariffs and non-tariff barriers, has allowed many countries to access global markets, enabling them to specialize in the production of goods and services in which they have a comparative advantage. This has enhanced productivity, attracted foreign investments, and facilitated technology transfer, all of which contribute to economic growth (Binos et al., 2023).

Moreover, global trade has had a significant impact on developing economies. In many instances, international trade has facilitated the movement of capital and labor, fostering innovation, and improving the efficiency of resource allocation. For example, in East Asia, countries like China and Vietnam have used international trade as a tool to propel economic growth, moving from low-income to middle-income status largely due to export-driven growth strategies (Rodrik, 2001). These countries have demonstrated that by liberalizing trade, economies can access the benefits of globalization, which includes higher productivity, improved standards of living, and enhanced industrialization.

At the regional level, the impact of international trade on economic growth has been similarly significant, although the benefits have been uneven across different African countries. In sub-Saharan Africa, trade liberalization policies have had mixed results. While some countries, such as Kenya and Ghana, have benefited from increased exports and improved growth rates after adopting more open trade policies, others have faced challenges such as a reliance on primary commodity exports, insufficient infrastructure, and inadequate technological advancement. In the African context, trade openness has helped improve economic conditions, but barriers such as limited access to global markets, political instability, and weak institutional frameworks have hindered the full realization of the potential benefits of international trade (Pereira, 2015).

A key issue for many African countries has been the mismatch between trade liberalization and the lack of industrial development. While the African Continental Free Trade Area (AfCFTA) has opened new trade opportunities, the ability to leverage these opportunities remains contingent on addressing challenges such as poor infrastructure, low productivity in the agricultural sector, and limited technological capabilities. In many African nations, exports remain concentrated in a few sectors, such as oil, minerals, and agricultural products, leaving them vulnerable to fluctuations in global commodity prices and limiting the benefits of trade liberalization (UNCTAD, 2018).

Tanzania, like many African nations, has experienced both the positive and negative impacts of international trade. Historically, Tanzania’s economy faced significant

barriers to international trade, including restrictive trade policies, over-reliance on primary exports, and poor infrastructure. These limitations were particularly evident in the 1980s and 1990s, when Tanzania's trade regime was characterized by high tariffs, import restrictions, and a general lack of trade facilitation mechanisms (Kanaan, 2000). However, following the liberalization reforms of the 1990s, Tanzania began to open up its economy, reduce trade barriers, and integrate more fully into the global trading system.

The liberalization of trade in Tanzania has had positive effects on the country's economic performance. For instance, the reduction of tariffs and the easing of non-tariff barriers in the 1990s led to an increase in exports, particularly in the agricultural and mining sectors (Ikenson, 2006). According to the World Bank (2020), Tanzania's exports of goods and services grew significantly between 2001 and 2020, particularly with the increased export of gold, coffee, and tobacco. Additionally, the country has experienced improvements in foreign direct investment (FDI), which has been instrumental in enhancing industrialization and technological capacity in key sectors such as mining and energy (Pereira, 2015).

However, despite these improvements, Tanzania's international trade performance has not been without challenges. While exports have increased, they remain heavily concentrated in a few sectors, and the country still faces structural problems such as insufficient infrastructure, low value-added exports, and a lack of technological innovation (Salinas & Aksoy, 2006). Furthermore, Tanzania has struggled with issues of economic diversification, as the country continues to rely on a few key

export commodities. The global fluctuations in the prices of goods like gold and coffee have exposed the vulnerabilities in Tanzania's trade-dependent economy. This mismatch between the liberalization of trade and the underdevelopment of certain sectors has contributed to slower-than-expected economic growth in comparison to other African nations that have similarly liberalized their trade regimes (Salinas & Aksoy, 2006).

The trend trade liberalization and economic growth in Tanzania can be attributed to several factors. Firstly, Tanzania's economic structure remains heavily dependent on a few primary products, making the economy vulnerable to global price fluctuations. While Tanzania has made significant strides in liberalizing trade and increasing exports, the lack of industrial diversification limits the extent to which the benefits of trade can be realized. This situation mirrors the broader regional experience in Africa, where trade liberalization has not always translated into sustained economic growth due to the persistence of structural weaknesses in the economy.

1.3 Statement of the Problem

International trade has long been acknowledged as a crucial factor in promoting economic growth, particularly for developing nations like Tanzania. Over the past few decades, Tanzania has embarked on a series of trade liberalization reforms, including reducing tariffs and promoting exports, with the overarching goal of boosting its economic growth. These reforms aimed to improve market access, enhance foreign exchange earnings, and attract foreign direct investment (FDI), all of which are critical to the country's economic development. However, despite these

efforts, the alignment between Tanzania's economic growth and its trade liberalization policies has been inconsistent. While there has been growth in the export sector, the country remains heavily dependent on a limited number of primary commodities, such as gold, coffee, and tobacco. This dependency makes Tanzania vulnerable to global price fluctuations, which has led to noticeable fluctuations in GDP growth rates between 2001 and 2020 (World Bank, 2020). As a result, Tanzania's overall GDP growth has remained relatively modest when compared to other African nations that have undertaken similar trade liberalization reforms.

Much of the existing literature on international trade and economic growth in Tanzania has focused on the liberalization process itself and its immediate impact on the export sector. Scholars such as Kanaan (2000) and Ikenson (2006) have documented the gradual removal of trade restrictions and the subsequent effects on trade volumes, tariffs, and foreign exchange availability. Other studies have explored the relationship between trade liberalization and GDP growth in Tanzania, pointing out that although trade reforms have opened up opportunities, the expected benefits have not always materialized due to structural challenges within the economy (Pereira, 2015).

However, a significant gap in the literature lies in the lack of comprehensive studies exploring the causality between net exports, net imports, and economic growth. While the relationship between exports and GDP growth has been widely studied (e.g., Kanaan, 2000; Ikenson, 2006), much less attention has been paid to the role of net imports. Imports, especially capital goods, technology, and raw materials, are

essential for the industrialization and technological advancement of the economy. However, their impact on long-term economic growth in Tanzania remains underexplored. As Tanzania continues to experience trade imbalances and struggles with import-heavy sectors, understanding the dynamics of both imports and exports is crucial to fully assessing the impact of international trade on the country's economic performance. This study aims to address these gaps by examining the effects of both net exports and net imports on Tanzania's economic growth from 2001 to 2020. In doing so, the study will also investigate the causal relationship between trade activities—both exports and imports—and economic growth. By exploring how trade imbalances and export dependency have shaped Tanzania's economic trajectory, this research provides valuable insights and offer policy recommendations for fostering balanced and sustainable growth in Tanzania's economy.

The existing literature reveals several critical gaps that this study intends to address. While much of the previous research has focused on the immediate effects of trade liberalization, especially in terms of export growth, limited attention has been given to the role of net imports in influencing Tanzania's economic trajectory. Imports of capital goods, technology, and raw materials are vital for Tanzania's industrialization and technological advancement, yet their impact on long-term economic growth remains insufficiently explored. Furthermore, the literature does not offer a comprehensive understanding of the causal relationships between both exports and imports and economic growth. There is a need for further investigation into whether net exports or net imports drive economic growth in Tanzania and whether these

relationships are reciprocal or unidirectional. By addressing these gaps, this study seeks to provide a more holistic understanding of the role of international trade in Tanzania's economic development, with the goal of offering policy recommendations for more effective trade liberalization strategies that can contribute to sustained and inclusive economic growth.

1.4 Research Objectives

1.4.1 General Objective

The general objective of this study was to examine the impact of international trade on economic growth of Tanzania.

1.4.2 Specific Objectives

i. To examine the effect of net export of goods and services on economic growth.
ii. To examine the effect of net import of goods and services on economic growth.
iii. To find out the causality between net export of goods and services, net import of goods and services and economic growth.

1.5 Hypotheses

H1 (Null Hypothesis):

There is no significant effect of net exports of goods and services on economic growth.

Alternative Hypothesis (H1):

There is a significant effect of net exports of goods and services on economic growth.

H2 (Null Hypothesis):

There is no significant effect of net imports of goods and services on economic growth.

Alternative Hypothesis (H2):

There is a significant effect of net imports of goods and services on economic growth.

H3 (Null Hypothesis):

There is no causality between net exports, net imports, and economic growth. Alternative Hypothesis (H3): There is causality between net exports, net imports, and economic growth.

1.6 Significance of the Study

The findings of this study have significant implications for future research endeavors in the area of international trade and economic growth. As Tanzania's economy evolves and its trade relationships expand, further research could explore the long-term impacts of trade liberalization on economic diversification, industrialization, and poverty reduction. Investigating sector-specific outcomes such as the role of agriculture, manufacturing, and services in driving growth would deepen our understanding of how different industries benefit from international trade. The study also opens avenues for examining the broader socio-economic consequences of international trade, including the effects on rural communities, the environment, and gender equality. Future research could examine how trade policies influence social

welfare indicators and contribute to achieving the United Nations' Sustainable Development Goals (SDGs), particularly in terms of reducing inequality and promoting sustainable economic practices.

The study adds to the body of knowledge by enhancing the understanding of the direct and indirect mechanisms through which international trade influences economic growth in developing countries like Tanzania. It highlights the need for a nuanced approach to trade policy that considers not only economic but also social and environmental dimensions. This contribution fills an important gap in the literature on the economic development of Tanzania, especially in the context of an increasingly globalized world where trade flows and integration into global supply chains are key to national prosperity.

Moreover, this research underscores the importance of institutional factors, such as trade facilitation, governance, and infrastructure, in determining the success of international trade in driving economic growth. It paves the way for future studies that explore how trade policies, coupled with good governance and robust institutions, can enhance the effectiveness of trade in promoting inclusive and sustainable growth. The study holds substantial significance for a wide range of stakeholders, including government agencies, trade organizations, international development partners, private businesses, and civil society groups. For government entities, the study provides evidence-based insights that can be used to refine national trade strategies, negotiate better trade agreements, and align economic policies with long-term developmental goals. Trade organizations can use the findings to better

support exporters, improve market access, and advocate for policies that promote fair and equitable trade practices.

1.7 Organization of the Study

The study covers six chapters. Chapter one covers the introduction, background, problem statement, objectives and hypothesis of the study. Also, it extends by providing the significance of the study, the scope as well as the limitations of the study. Chapter two covers the summary of the literature work as well as the empirical model and theoretical framework drawing the analysis of the impact of international trade on economic growth. Chapter three explains the methodology to be used in the study and methods of gathering data. Chapter four provides the analysis, interpretation and presentation of findings on the causality relationship between international trade and the economic growth of Tanzania. Chapter five provides the analysis, interpretation and presentation of findings on the bidirectional relationship between international trade and the economic growth of Tanzania. In the end, chapter six provides a summary, conclusion and policy implication.

1.8 Scope of the Study

This study weighed up the relationship of international trade underpinning the economic growth of Tanzania through the statistics aggregated in annual time series from 2001 to 2020. For the accomplishment of the study purpose, secondary data were used as the mitigation of encumbrances arising from time and data collection expenses. The study is so done to ensure that the study objective is done with effectiveness.

1.9 Research Limitations

Various studies on international trade and economic growth have been undertaken. However, some of them have applied panel data, while others have employed time-series data. This diversity has led to controversial findings. This study analyzes the impact of international trade on economic growth in Tanzania but is limited to the period between 2001 and 2020. The narrow scope is largely due to the unavailability of comprehensive international trade data prior to 1990, which makes it challenging to analyze long-term trends or historical impacts. Furthermore, variables related to international trade and economic growth often lacked adequate quarterly data, which posed difficulties for more detailed analysis. To address this limitation, the study use the data aggregation techniques to smooth over gaps and ensure consistency in the findings. However, the lack of sufficient quarterly data may still affect the precision of the analysis, particularly for certain variables that fluctuate more frequently.

Another limitation is the insufficiency of the Consumer Price Index (CPI) data for Tanzania, especially prior to the 1980s. This absence could have skewed the findings related to inflation and price stability, which are essential for understanding the broader economic context. To mitigate this, the study use supplemented the CPI data with relevant proxy indicators, such as the Producer Price Index (PPI), where applicable.

Additionally, a potential limitation is the exclusion of non-tariff barriers (NTBs) in the analysis, which could have provided a more comprehensive understanding of international trade's impact. These barriers include issues such as quotas, subsidies,

and licensing requirements, which can also influence trade flows and, in turn, economic growth. However, due to data constraints, NTBs were not included in this study. Future research could explore the inclusion of these factors when more data becomes available.

Lastly, the scope of the research is focused on Tanzania’s trade relations without considering broader global economic factors, such as geopolitical shifts or the COVID-19 pandemic's impact on trade flows. These factors could have affected international trade and economic growth during the study period. Future studies may address this limitation by incorporating global economic variables or conducting a comparative analysis with other countries in the region.

CHAPTER TWO

LITERATURE REVIEW

2.1 Chapter Overview

This chapter provides an in-depth review of conventional trade theories and their relationship with economic growth. The chapter is structured into three key sections. The first section presents theoretical literature by discussing various trade theories and how they relate to economic growth, particularly in the context of Tanzania. The second section focuses on empirical literature, summarizing key studies that have examined the relationship between international trade and economic growth, including evidence from Tanzania and other developing economies. Finally, the chapter identifies research gaps and introduces a revised conceptual framework to guide the study.

2.2 Theoretical Literature

International trade is central to economic growth theories, which suggest that trade liberalization can stimulate productivity, enhance competitiveness, and accelerate economic growth (Ricardo, 1817). Several theories explain how trade activities influence economic growth. This section provides a comprehensive theoretical framework for understanding the impact of international trade on Tanzania's economic growth from 2001 to 2020, focusing on the effects of net exports, net imports, and their causal relationships with GDP growth.

Classical Growth Theory

The **Classical Growth Theory**, developed by economists such as Adam Smith (1776) and David Ricardo (1817), argues that free markets and trade promote

economic growth by allocating resources efficiently. According to this view, economic growth is driven by factors such as labor, capital accumulation, and technological progress. Classical economists emphasize the role of international trade in increasing the division of labor and expanding markets, leading to higher productivity and economic growth (Smith, 1776). For Tanzania, this means that engaging in global trade can help raise national income by optimizing resource allocation and stimulating investment in capital goods, which are necessary for technological advancement.

Neo-Classical Growth Theory

The **Neo-Classical Growth Theory**, introduced by Robert Solow (1956), builds on the Classical model by incorporating technological change as an exogenous factor that influences long-term growth. According to Solow's model, steady growth is the result of capital accumulation, labor force growth, and technological progress. Neo-classical theory emphasizes that international trade and investment can promote growth by enabling countries to access new technologies and invest in capital (Solow, 1956). In the Tanzanian context, the theory suggests that trade liberalization and foreign investment can accelerate technological progress and capital formation, thus boosting economic growth. However, the model also highlights that the country must invest in human capital and technological innovation to sustain long-term growth (Pereira, 2015).

Comparative Advantage Theory

David Ricardo's *Comparative Advantage Theory* (1817) posits that countries benefit from trade by specializing in producing goods and services in which they have a

lower opportunity cost relative to other nations. According to this theory, by specializing in the production of goods where a country has a comparative advantage, and trading those goods, nations can achieve higher levels of efficiency and economic growth (Krugman & Obstfeld, 2009). For Tanzania, this theory suggests that its specialization in the export of agricultural products and natural resources, such as gold, coffee, and tobacco, can stimulate economic growth. However, the challenge for Tanzania remains the limited diversification of its exports, which exposes the economy to fluctuations in global commodity prices, a factor that hinders consistent economic growth (World Bank, 2020).

Heckscher-Ohlin Model

The *Heckscher-Ohlin Model* (1933) expands on the theory of comparative advantage by incorporating factors of production, such as labor and capital, into the analysis. The model argues that countries will export goods that utilize their abundant and cheap factors of production while importing goods that require factors in which they are scarce. In Tanzania's context, the theory suggests that the country, with abundant labor and land, may export primary goods, while importing capital and intermediate goods essential for industrialization and technological advancement (Salinas & Aksoy, 2006). This model explains the relationship between trade liberalization, economic growth, and industrialization, emphasizing that Tanzania's heavy reliance on primary exports and the importation of capital goods might limit its capacity to industrialize and diversify its economy.

Endogenous Growth Theory

The *Endogenous Growth Theory* (Romer, 1990) emphasizes that technological progress and human capital are key drivers of economic growth, and that trade can influence these factors by fostering innovation, knowledge transfer, and access to new technologies. In the case of Tanzania, trade liberalization may provide opportunities for technology transfer through imports of capital goods and foreign direct investment (FDI). However, Tanzania's low level of technological capacity and industrialization has slowed its ability to fully capitalize on these benefits. Despite increases in export growth, the lack of technological advancement and limited local value addition remains a major constraint on achieving sustainable long-term growth (Pereira, 2015).

Trade Liberalization and Growth Theory

The *Trade Liberalization and Growth Theory* suggests that trade liberalization fosters economic growth by reducing barriers to international trade, such as tariffs and import quotas, thus allowing more efficient resource allocation and fostering competition (Cernat, 2001). For Tanzania, trade liberalization, which began in the 1990s, was expected to open new markets for Tanzanian goods, improve foreign exchange earnings, and attract FDI. While there has been growth in exports, the country continues to face significant barriers such as inadequate infrastructure, political instability, and a lack of diversification, which have hampered the expected growth from trade liberalization (Salinas & Aksoy, 2006). The theory underscores the need for complementary domestic reforms in infrastructure and institutional frameworks to fully leverage the benefits of trade liberalization.

Import Substitution and Export-Led Growth Hypothesis

The *Import Substitution and Export-Led Growth Hypothesis* advocates for a dual approach where countries simultaneously try to reduce reliance on imports by developing domestic industries and focus on increasing exports as a means of driving economic growth. Import substitution strategies encourage the development of domestic industries to replace imports, while export-led growth focuses on boosting exports to drive economic expansion (Chenery & Strout, 1966). Tanzania's approach has seen gradual liberalization of imports, especially through tariff reductions and the promotion of export-oriented sectors. However, the country's continued reliance on imports of capital goods and industrial inputs, without a commensurate increase in the export of manufactured goods, highlights the challenge of achieving export-led growth (World Bank, 2020).

Gravity Model of Trade

The *Gravity Model of Trade* is widely used in analyzing bilateral trade flows and suggests that trade between two countries is positively related to their economic size (GDP) and inversely related to the distance between them (Tinbergen, 1962). This model emphasizes that countries with larger economies and closer geographical proximity are more likely to engage in trade, which in turn can stimulate economic growth. For Tanzania, the model suggests that its relatively small economy and geographical location may limit trade with more developed markets, restricting the country's potential for economic growth through exports. Despite this, regional integration initiatives like the East African Community (EAC) provide Tanzania with

opportunities to increase trade within East Africa, offering a platform to enhance trade volume and, ultimately, GDP growth.

Trade Imbalances and Economic Growth Theory

The *Trade Imbalances and Economic Growth Theory* explores the relationship between trade balances (exports minus imports) and economic growth. Some scholars argue that trade deficits can be detrimental to economic growth as they may lead to a drain on foreign exchange reserves and increase external debt, while others suggest that trade deficits are not inherently harmful and may even reflect a nation's investment in capital goods and technology (Krugman, 2008). For Tanzania, its trade imbalances, characterized by rising import bills particularly for capital goods, pose a challenge to economic growth. Despite export growth, the continued import dependency undermines the long-term sustainability of economic growth (World Bank, 2020).

2.3 Empirical Literature Review

This section reviews empirical studies that have explored the relationship between international trade and economic growth, with a particular focus on Tanzania. Several scholars have examined the effects of net exports, net imports, and the causality between trade and economic growth, providing valuable insights into how trade policies have influenced Tanzania's economic trajectory. This review will discuss relevant studies, highlight their contributions, and provide criticisms, ultimately identifying the gap that the present study seeks to address. The relationship between international trade and economic growth has been a subject of

extensive research, with many studies highlighting the vital role trade plays in boosting productivity, enhancing business activities, and promoting economic development. Tanzania, a developing nation in East Africa, has experienced the effects of trade liberalization, which has had both positive and negative implications for its economic growth trajectory. Below is an empirical review of literature on the impact of international trade on Tanzania's economic growth.

Export growth has often been associated with economic expansion, as it provides nations with foreign currency, stimulates industrial activity, and creates job opportunities. Several studies on Tanzania's export performance suggest that net exports have had a notable, though not always transformative, effect on the country’s economic growth.

Salinas & Aksoy (2006) argue that Tanzania’s export sector, particularly in primary commodities such as gold, coffee, and tobacco, has been central to the country’s foreign exchange earnings. These exports have helped fuel industrial growth in sectors like mining and agriculture, facilitating the expansion of key industries. The increased revenue from these exports contributed to economic growth by enabling investments in infrastructure and reducing external debt burdens.

However, research by Pereira (2015) points out that while exports have contributed positively to economic growth, their growth has been limited due to the country's over-reliance on a few key commodities. Despite the progress made in the 1990s when Tanzania began implementing trade liberalization policies, the economy

remains vulnerable to external shocks like price fluctuations in global markets. The heavy dependence on primary commodity exports has led to significant volatility in Tanzania's trade performance, which in turn affects economic stability.

Additionally, Rodrik (2001) supports the view that the relationship between exports and economic growth is not always straightforward. He posits that for export-led growth to occur, a country must possess certain institutional and structural capabilities to capitalize on trade opportunities. Tanzania's progress in this area has been limited by insufficient technological and industrial capacity, which has prevented the country from fully benefiting from its export-led growth strategy. While much of the literature on international trade focuses on exports, the role of imports, particularly capital goods and technology, is equally important in fostering economic growth. The importation of advanced technologies and machinery plays a crucial role in improving productivity and accelerating industrialization, particularly in developing countries like Tanzania.

Research by Msuya et al. (2013) suggests that net imports of capital and intermediate goods have contributed to Tanzania's industrial growth, particularly in manufacturing and infrastructure development. Imports of machinery, technology, and raw materials have enabled the country to modernize its industries, which in turn has supported economic growth. However, despite the positive effects of importing capital goods, Tanzania's import bill remains high, leading to persistent trade imbalances.

Binos et al. (2023) highlight the role of imports in facilitating industrial growth, particularly through the importation of advanced technologies. However, they caution that excessive reliance on imports can create long-term vulnerabilities. Tanzania has struggled with these vulnerabilities, as heavy imports of machinery and technology often come with large foreign exchange demands, which further exacerbate trade deficits and inflationary pressures on the economy. In the long run, while imports play an essential role in industrialization, their contribution to growth can be hindered by the country's limited capacity to export value-added goods. A significant area of interest in the literature on international trade is the direction of causality between exports, imports, and economic growth. Studies on causality in Tanzania's case reveal mixed results, with some suggesting that exports drive growth, while others argue that imports also play an essential role.

Ishfaq & Nordin (2014) used Granger causality tests to examine the relationship between exports and economic growth in Tanzania and found a unidirectional causality running from exports to GDP growth. This finding aligns with the export-led growth hypothesis, where increased exports stimulate economic growth through enhanced foreign exchange earnings, employment, and industrial expansion.

On the other hand, Tariq et al. (2016) suggest that the relationship is more complex. In their study, they explored the interaction between imports and GDP growth and found bidirectional causality between imports and economic growth. They argue that imports, particularly in the form of capital goods and technology, are essential for

enhancing productivity and industrial capacity, which in turn contributes to economic growth.

However, Ahmed & Hussain (2018) note that while imports can positively impact growth in the short term, an over-reliance on imports can ultimately hinder sustainable growth. Their study found that imbalances in trade, such as higher imports relative to exports, can strain the country's foreign reserves and lead to economic instability. This highlights the importance of ensuring that trade liberalization policies are complemented by efforts to diversify the export base and reduce dependency on imports. The role of trade liberalization in Tanzania's economic development has been widely studied. As mentioned earlier, Tanzania embarked on a series of trade liberalization reforms in the 1990s, which included reducing tariffs, removing non-tariff barriers, and liberalizing foreign exchange controls. These efforts were aimed at improving market access, stimulating exports, and fostering overall economic growth.

Ikenson (2006) found that trade liberalization had a positive impact on Tanzania's export performance, particularly in the agricultural and mining sectors. Exports of goods like gold, coffee, and tobacco increased significantly between 2001 and 2020, contributing to higher foreign exchange earnings and economic growth. Additionally, the liberalization of the trade regime facilitated foreign direct investment (FDI), which helped improve industrial capacity and technological development.

However, Salinas & Aksoy (2006) caution that despite the positive impact of trade liberalization, Tanzania's economy remains vulnerable due to its heavy reliance on a

few key export commodities. They argue that the country's failure to diversify its export base has limited the full benefits of trade liberalization, as fluctuations in global prices for key commodities can significantly impact the economy. This study aims to address these gaps by exploring the underexplored role of net imports in economic growth, examining the causal relationships between trade activities and growth, and evaluating the specific challenges that Tanzania faces in fully capitalizing on trade liberalization. By doing so, the study will contribute to a deeper understanding of how Tanzania can leverage international trade to achieve sustained economic growth.

2.4 Research Gap

This study seeks to address several critical gaps in the existing literature on the impact of international trade on economic growth, particularly in the context of Tanzania. Based on the guidelines provided by the Open University, the research gap for this study can be delineated by considering the key aspects of international trade, economic growth, and the underlying assumptions in the existing literature. The identified gaps are outlined below, with reference to relevant scholars and their findings.

Underexplored Role of Net Imports in Economic Growth: While previous studies on Tanzania, such as Kanaan (2000) and Ikenson (2006), have primarily focused on the export sector and its relationship with economic growth, there is limited investigation into the role of **net imports** in shaping Tanzania's economic trajectory. Imports, especially capital goods, technology, and raw materials, are critical for

industrialization and technological advancement. However, their impact on long-term economic growth remains underexplored. For instance, Salinas & Aksoy (2006) pointed out the importance of imports in the industrialization process, but their relationship with economic growth in Tanzania has not been extensively studied.

Limited Understanding of Causality between Trade Activities and Economic Growth: A major gap in the literature concerns the **causal relationship** between net exports, net imports, and economic growth. While the **association** between exports and GDP growth has been well-documented (e.g., Ikenson, 2006), the **direction and nature of causality** between these variables have not been sufficiently addressed. Several studies (e.g., Pereira, 2015) have highlighted the correlation between trade liberalization and economic performance, but the question of whether net exports or net imports drive economic growth in Tanzania, and whether these effects are reciprocal or unidirectional, has largely been overlooked. This study will aim to fill this gap by examining the causal links between trade activities and economic growth.

Export Dependency and Vulnerability to Global Price Fluctuations: Tanzania's economic growth remains heavily dependent on primary exports, such as gold, coffee, and tobacco, making the economy vulnerable to global price fluctuations. Although scholars such as Kanaan (2000) and Ikenson (2006) have explored the effects of trade liberalization on export performance, there is limited research on how **export dependency** and the **lack of export diversification** affects the country's long-term economic growth. This study will focus on how Tanzania's heavy reliance

on a narrow range of export commodities impacts its resilience to external shocks and global price changes, especially in the context of trade liberalization.

Inconsistent Results on the Impact of Trade Liberalization on Economic Growth: While research on trade liberalization has shown mixed results for many developing countries (e.g., Binos et al., 2023; Rodrik, 2001), there is limited evidence of how these reforms have been **specifically tailored** to address Tanzania's unique economic structure. Scholars such as Pereira (2015) have noted that trade liberalization often fails to generate sustained growth in countries that face structural constraints such as poor infrastructure and technological underdevelopment. However, few studies have evaluated how trade liberalization can be further optimized in Tanzania, given its specific challenges. This study will focus on these aspects by examining how trade liberalization policies may need to be adjusted to promote balanced and sustainable economic growth in Tanzania.

Lack of Cross-Country Comparisons: Much of the research on Tanzania's trade and economic growth focuses solely on the national context (e.g., Kanaan, 2000; Ikenson, 2006). While there is some literature on the experiences of other African countries (e.g., Kenya and Ghana) with trade liberalization, there is a lack of **comparative studies** that examine Tanzania's trade performance relative to other nations with similar trade liberalization efforts. The absence of such comparisons makes it difficult to assess whether Tanzania's experience is an outlier or follows a broader regional trend. This study aims to bridge this gap by considering how

Tanzania's trade liberalization compares to other African nations, offering insights into how the country can better position itself in the global trade landscape.

Structural Challenges in Trade Policy Implementation: Another research gap concerns the **structural challenges** in implementing trade liberalization policies in Tanzania. Despite a reduction in tariffs and non-tariff barriers, as documented by Ikenson (2006) and Pereira (2015), Tanzania continues to face challenges such as poor infrastructure, inadequate industrial development, and limited technological capabilities. These obstacles have limited the full benefits of trade liberalization and hindered the country's ability to diversify exports. This study will explore how these structural limitations affect the implementation and impact of trade liberalization policies on economic growth.

2.5 Conceptual Framework

The conceptual framework for this study explores the relationship between international trade activities—specifically **net exports** (exports minus imports) and **net imports** (including capital goods, technology, and raw materials)—and economic growth in Tanzania. This framework incorporates both the direct and indirect impacts of trade on GDP growth, highlighting how trade liberalization policies influence the economic trajectory of Tanzania.

The framework consists of the following key components:

Net Exports:

- The difference between exports and imports, focusing on how **export growth** (primarily in goods such as gold, coffee, and tobacco) influences Tanzania's GDP growth.
- **Export-led growth**, which contributes to foreign exchange earnings, employment generation, and an improved balance of payments, is a key factor.
- The effect of **export diversification** is also considered, given Tanzania's dependency on a few primary commodities.

Net Imports:

- **Imports of capital goods**, technology, and raw materials are vital for the industrialization process and technological advancement of the economy.
- These imports directly impact long-term economic growth by providing the tools and inputs needed for economic modernization.

Causal Relationships:

- Investigating whether **net exports** or **net imports** drive economic growth more significantly in Tanzania, or whether the relationship is **reciprocal**.
- Analyzing the influence of **trade liberalization policies** such as tariff reductions, improved market access, and FDI attraction on economic growth.
- Understanding how **trade imbalances** (exports vs. imports) and dependency on primary commodity exports affect overall GDP growth.

Control Variables:

The study incorporates key control variables to account for factors other than trade that may influence economic growth, such as:

- **Foreign Direct Investment (FDI)**: The level of FDI inflows affects infrastructure development, technology transfer, and industrial capacity, all of which are critical for economic growth.
- **Inflation (CPI and PPI)**: High inflation can erode purchasing power, decrease investment, and affect export competitiveness, which could impact growth outcomes.
- **Government Policies/Trade Liberalization**: Policies such as the reduction of tariffs, removal of trade restrictions, and facilitation of FDI play significant roles in shaping the trade environment and growth prospects.
- **Global Economic Factors**: External factors like global price fluctuations, geopolitical shifts, and global economic conditions can significantly impact Tanzania's trade flows and economic performance.
- **Exchange Rate**: The **exchange rate** plays a crucial role in influencing the price competitiveness of exports and imports. A **depreciated exchange rate** may improve the competitiveness of Tanzanian exports but also raise the cost of imports, potentially affecting inflation and trade balances. Understanding the exchange rate dynamics is essential for comprehensively assessing the impact of trade on economic growth.

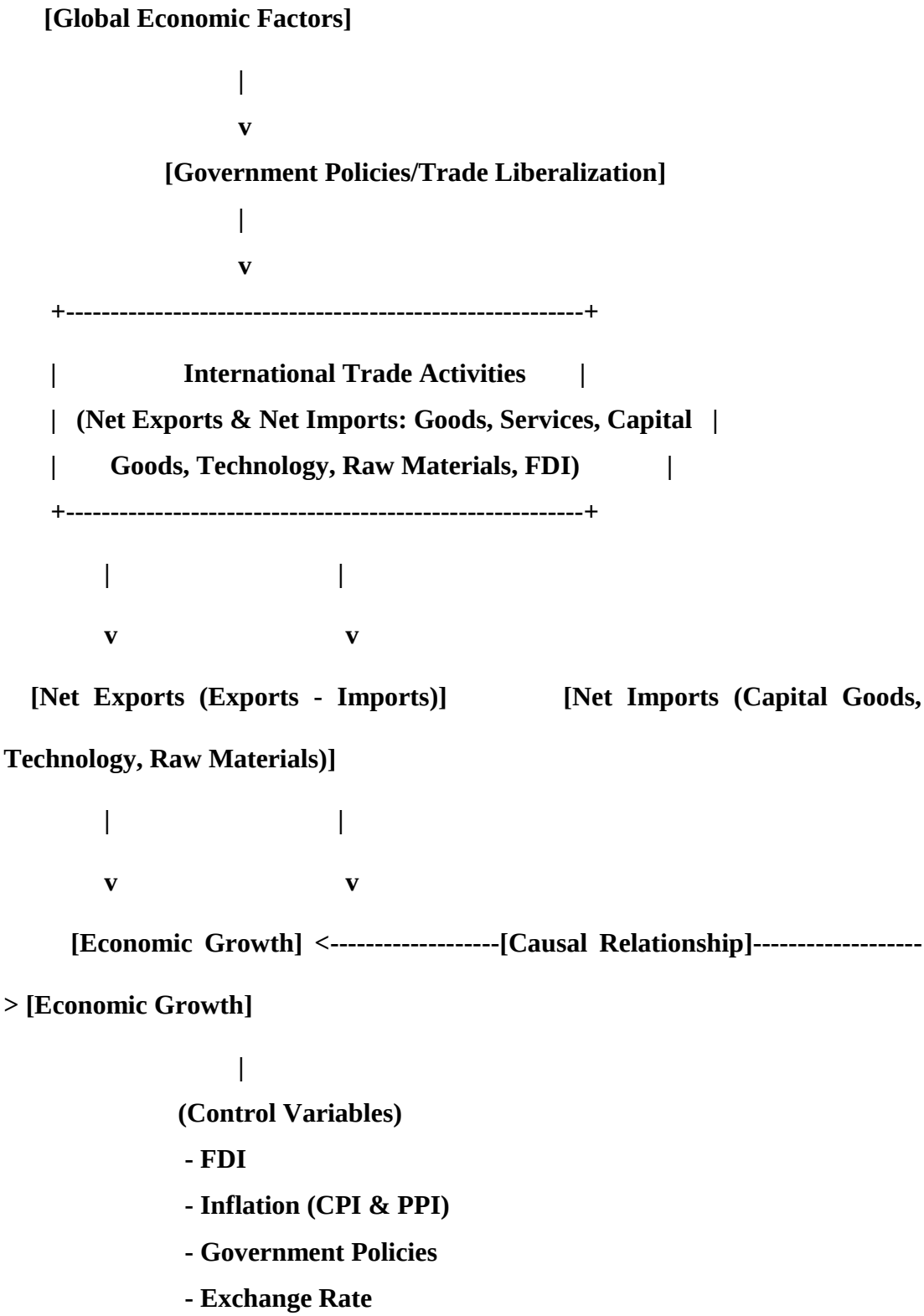

Figure 2.1: Conceptual Framework

Source: Researcher own constructed 2025\

Summary and Research Gap

The research gap identified in the problem statement reveals key areas where the existing literature on Tanzania's international trade and economic growth is insufficient. First, there has been a **limited focus on net imports**. Much of the existing research has primarily concentrated on exports and their immediate impacts on GDP growth, while the role of net imports has been underexplored. Imports of capital goods, technology, and raw materials are essential for Tanzania's industrialization and technological advancement, making them a crucial factor in long-term economic growth. This study fills this gap by examining the influence of net imports on Tanzania's economic growth.

Second, **causal relationships** between both exports and imports and economic growth have not been sufficiently addressed in the literature. While studies on the relationship between exports and GDP growth abound, fewer have examined whether net exports or net imports drive economic growth more significantly, or if their effects are reciprocal or unidirectional. This study aims to investigate the causal dynamics between net exports, net imports, and economic growth in Tanzania, contributing to a deeper understanding of how trade activities influence growth.

Third, many studies have **excluded control variables** that are essential for providing a more holistic view of the factors influencing economic performance. Variables such as foreign direct investment (FDI), inflation, and government policies play significant roles in shaping economic growth, but they have often been overlooked in previous research. This study addresses this gap by incorporating these control variables, ensuring a more comprehensive analysis of the economic factors at play.

Fourth, **global economic shocks** have often been neglected in past studies, despite their substantial impact on trade flows and growth outcomes. Factors such as global price fluctuations, geopolitical events, and broader economic conditions can significantly influence Tanzania’s trade and economic performance. By considering these external influences, this study aims to provide a more accurate picture of how global dynamics affect Tanzania's economy.

Finally, the impact of the **exchange rate** on trade flows and economic growth has been underrepresented in the literature on Tanzania. Exchange rate fluctuations can affect the competitiveness of exports and the cost of imports, which in turn influence economic growth. This study will incorporate the exchange rate as a control variable to provide a more complete understanding of how exchange rate dynamics intersect with trade and growth.

This study seeks to provide a comprehensive understanding of the role of international trade, encompassing both net exports and net imports, in shaping Tanzania's economic growth from 2001 to 2020. By addressing the existing gaps in the literature concerning net imports, causal relationships, and control variables such as FDI, inflation, government policies, and the exchange rate, this study aims to offer valuable insights into how international trade policies and structural factors interact to influence Tanzania’s economic trajectory. Furthermore, it will provide policy recommendations that can guide future trade liberalization strategies, fostering sustained and inclusive growth.

In conclusion, this improved conceptual framework, together with the identified research gaps and the study's objectives, will help contextualize the analysis of Tanzania's economic growth within the broader dynamics of international trade, offering clearer insights for both academic understanding and policy formulation

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Chapter Overview

This chapter presents the research methodology used to examine the impact of international trade on Tanzania's economic growth. The study is based on secondary data collected from reputable sources such as the Bank of Tanzania (BoT), National Bureau of Statistics (NBS), Tanzania Revenue Authority (TRA), and international institutions including the World Bank (WDI), International Monetary Fund (IMF), and United Nations Conference on Trade and Development (UNCTAD). The methodology covers the research design, research philosophy, variables, data collection, research approach, empirical model specification, estimation techniques, diagnostic tests, and data analysis procedures.

3.2 Research Design

The study adopts a positivist research philosophy, which emphasizes the use of empirical data, statistical analysis, and objective measurements to determine causal relationships. Positivism is appropriate for this study as it relies on observable and quantifiable data to draw conclusions about the effect of net exports, net imports, and other trade-related factors on economic growth (Saunders et al., 2019).

Positivism aligns with the application of econometric techniques such as:

- Granger Causality Tests to determine whether changes in trade variables predict economic growth or vice versa.

- Cointegration Analysis to establish whether there is a long-term equilibrium relationship between trade and economic growth.
- Regression Models, including ARDL, VAR, and VECM, to provide a systematic and replicable approach to analyzing economic relationships.

The ARDL Model, in particular, is suitable within the positivist paradigm as it allows for hypothesis testing using statistical inference, ensuring an objective evaluation of the relationships between trade variables and economic growth. The inclusion of an error correction mechanism (ECM) in the ARDL framework also aligns with the positivist approach by quantifying how quickly economic growth adjusts in response to trade-related shocks.

Furthermore, this philosophy supports the use of secondary data from reputable sources, ensuring reliability and validity in the research findings (Bryman, 2012). The study utilizes secondary and quarterly time series data collected from databases available on credible websites, enhancing the robustness and reliability of the analysis. The use of econometric models within a positivist framework allows for a rigorous statistical examination of the impact of international trade on Tanzania's economic growth, supporting evidence-based policy recommendations.

3.3 Research Philosophy

The study adopts a **positivist research philosophy**, which emphasizes the use of empirical data, statistical analysis, and objective measurements to determine causal relationships. Positivism is appropriate for this study as it relies on observable and

quantifiable data to draw conclusions about the effect of net exports, net imports, and other trade-related factors on economic growth (Saunders et al., 2019).

Positivism aligns with the application of **econometric techniques** such as Granger causality tests, cointegration analysis, and regression models, which provide a systematic and replicable approach to analyzing economic relationships. This philosophy is also in line with the use of secondary data from reputable sources, ensuring reliability and validity in the research findings (Bryman, 2012).

3.4 Variables and Data

This study considers both dependent and independent variables, incorporating key macroeconomic factors that influence economic growth in Tanzania. The selection of these variables is based on economic theory and empirical literature (Salinas & Aksoy, 2006; Rodrik, 2001). The data sources include national and international institutions to ensure accuracy and reliability.

Dependent Variable

- **Gross Domestic Product (GDP) Growth Rate** – The study measures economic growth using the quarterly GDP growth rate, obtained from the National Bureau of Statistics (NBS) Tanzania and the World Bank Development Indicators (WDI). This variable serves as the primary indicator of Tanzania's overall economic performance.

Independent Variables

- **Net Exports (X-M)** – Measured as the difference between total exports and total imports, sourced from the Bank of Tanzania (BoT) and Tanzania Revenue Authority (TRA). This variable reflects the direct contribution of trade balance to economic growth.
- **Net Imports of Capital Goods and Technology** – Represents the quarterly value of imported capital goods and technological equipment, sourced from BoT and TRA. It helps analyze the role of industrial inputs in economic growth.
- **Trade Openness (Exports + Imports as % of GDP)** – A measure of trade liberalization, sourced from the World Bank Development Indicators (WDI).
- **Foreign Direct Investment (FDI) Inflows** – Captures the role of international investment in Tanzania's economy, sourced from the United Nations Conference on Trade and Development (UNCTAD) and BoT.
- **Inflation Rate (Consumer Price Index [CPI] and Producer Price Index [PPI])** – Represents the overall price level changes and cost pressures in the economy, influencing trade and economic growth. This data is sourced from NBS Tanzania.
- **Exchange Rate (Tanzania Shilling/USD)** – Examines the impact of currency fluctuations on trade and economic stability, sourced from BoT and the International Monetary Fund (IMF).

3.5 Data Collection and Sources

The study relies on secondary data, which is appropriate for time series analysis and econometric modeling (Wooldridge, 2016). The quarterly data spanning from **2001 to 2020** is sourced from reputable institutions, including:

Bank of Tanzania (BoT) – for trade balance, exchange rate, and FDI data.

Tanzania Revenue Authority (TRA) – for detailed export and import data.

National Bureau of Statistics (NBS) – for GDP growth rates, inflation rates, and other macroeconomic indicators.

World Bank Development Indicators (WDI) – for trade openness and global economic comparisons.

International Monetary Fund (IMF) – for exchange rate trends and global economic conditions.

United Nations Conference on Trade and Development (UNCTAD) – for FDI statistics and trade investment reports.

Justification for the Choice of Data The choice of **quarterly data** provides a more detailed and accurate analysis compared to annual data, allowing for better tracking of short-term fluctuations and long-term trends in trade and economic growth (Gujarati & Porter, 2009). The use of secondary data is also cost-effective, reliable, and suitable for time series econometric analysis.

3.6 Research Approach

The study adopts a quantitative research approach, which is appropriate for analyzing the impact of international trade on economic growth using numerical data and statistical techniques. A quantitative approach is chosen because it allows for objective measurement, hypothesis testing, and empirical validation of economic relationships through econometric modeling (Creswell, 2014). This approach is suitable for studies dealing with macroeconomic data, where statistical inference is essential in establishing causality and patterns over time (Wooldridge, 2016).

The use of **time series data from 2001 to 2020** necessitates a quantitative approach to apply econometric techniques such as:

- **Autoregressive Distributed Lag (ARDL) Model**, which is particularly useful for analyzing both **short-run and long-run relationships** in time-series data that may have different levels of integration (Pesaran & Shin, 1999). The **ARDL model** is chosen because it can handle variables that are **integrated at different orders** (i.e., I(0) and I(1)), making it flexible for analyzing trade-growth relationships.
- **Vector Autoregression (VAR) Model**, which captures the **dynamic interactions** between trade variables and GDP growth over time without imposing any prior assumptions about endogeneity.
- **Vector Error Correction Model (VECM)** to analyze long-run equilibrium adjustments if cointegration is found among the variables.
- **Granger Causality Tests** to determine the **direction of causality** between trade variables and economic growth.
- **Cointegration Analysis**, such as the **Bounds Test for Cointegration** in the ARDL framework, to verify the existence of a **long-run relationship** among the variables.

Combining ARDL and VAR Models

This study integrates both **ARDL and VAR models** for a comprehensive analysis of the relationship between **international trade and economic growth**. The rationale for combining these models is:

Capturing Both Short-Run and Long-Run Effects – The **ARDL model** effectively estimates both **short-run and long-run relationships**, while the **VAR model** focuses on short-run **dynamic interactions** and shocks among variables. By using both models, the study ensures a **comprehensive understanding** of trade's effect on economic growth.

Flexibility in Data Integration Orders – The ARDL model is chosen because it allows for the estimation of **time series data with mixed integration orders** (i.e., I(0) and I(1)), while the **VAR model requires all variables to be stationary at the same level**. Using ARDL ensures that variables with different integration levels can still be analyzed effectively.

Causality and Dynamic Interactions – The **VAR model** is particularly useful for analyzing **short-run interactions** among economic variables. By incorporating Granger causality within the **VAR framework**, the study determines whether trade variables **cause economic growth or vice versa**.

Error Correction and Equilibrium Adjustment – If cointegration exists, an **Error Correction Model (ECM)** is applied within the **ARDL framework** to examine the **speed of adjustment** of economic growth toward its long-run equilibrium. The **VECM model** is also used to analyze how trade variables **adjust to long-term changes**.

Robust Policy Implications – By employing both **ARDL and VAR models**, the study provides **more robust policy insights**, helping policymakers **understand trade policies' effects in both short-run fluctuations and long-term growth stability**.

3.6.1 Expectations of Using this Approach

By adopting this quantitative research approach, the study expects to achieve the following outcomes:

Objective and Empirical Analysis – The approach ensures that the findings are based on rigorous statistical evidence rather than subjective interpretation.

Establishment of Causal Relationships – By employing time series econometric techniques such as VAR and ARDL, the study aims to identify both short-run and long-run causal relationships between trade variables and GDP growth.

Reliable and Reproducible Results – The use of secondary data from reputable sources enhances the credibility and validity of the study's findings, allowing for replication in future research.

Data-Driven Policy Recommendations – The results will inform policymakers by providing empirically tested insights into how trade policies impact economic growth.

Enhanced Predictive Capabilities – By using econometric models, the study aims to generate forecasts and predictions regarding the future trends of trade and economic growth in Tanzania.

By incorporating ARDL and VAR models, this study ensures a comprehensive, robust, and empirically validated analysis of how international trade influences Tanzania's economic growth over time.

3.7 Empirical Model and Econometric Issues

Model Specification

This study adopts a standard growth equation framework to assess the impact of international trade on Tanzania's economic growth. The empirical model is specified as follows:

where:

- **GDP** = Gross Domestic Product (proxy for economic growth)
- **NX** = Net exports (exports minus imports)
- **NI** = Net imports (capital goods, technology, and raw materials)
- **FDI** = Foreign Direct Investment inflows
- **CPI** = Inflation (measured by the Consumer Price Index, CPI)
- **ER** = Exchange rate (Tanzanian Shilling against the US dollar)
- = Constant term
- = Coefficients of explanatory variables
- = Error term

The choice of these variables aligns with the research objectives, which seek to evaluate the role of trade balances, FDI, inflation, and exchange rate fluctuations in shaping Tanzania's economic growth.

Estimation Technique

The study employs the **Autoregressive Distributed Lag (ARDL) Model**, which is suitable for analyzing both long-run and short-run relationships in time-series data (Pesaran & Shin, 1999). The ARDL model is chosen due to its flexibility in handling variables integrated at different orders, i.e., I(0) and I(1). The general form of the ARDL model is:

Where **X** represents the set of explanatory variables, and capture long-run effects. The **Bounds Test for Cointegration** (Pesaran et al., 2001) is applied to determine the existence of a long-term relationship among the variables.

Causality Analysis

To examine the direction of causality between trade and economic growth, the **Granger Causality Test** (Granger, 1969) is used. This test helps determine whether changes in net exports and net imports predict economic growth or vice versa. The basic Granger causality test follows:

A significant implies that net exports Granger-cause GDP, while a significant suggests GDP influences net exports. The same approach applies to net imports.

Econometric Issues

To ensure the robustness of the empirical model, the following econometric issues are addressed:

Stationarity Tests:

- The **Augmented Dickey-Fuller (ADF) Test** (Dickey & Fuller, 1981) is applied to check for stationarity in time-series data. If variables are non-stationary at levels but stationary at first differences, differencing is applied to avoid spurious regression.

Cointegration Analysis:

- The **Johansen Cointegration Test** (Johansen, 1988) is employed to verify whether a long-term equilibrium relationship exists among the variables. If cointegration is

  found, an **Error Correction Model (ECM)** is estimated to capture short-term deviations from equilibrium.

Heteroskedasticity and Autocorrelation:

- The **Breusch-Pagan Test** (Breusch & Pagan, 1979) is used to check for heteroskedasticity, ensuring that error variances are constant.
- The **Durbin-Watson Statistic** (Durbin & Watson, 1950) and **Breusch-Godfrey Serial Correlation LM Test** are employed to detect autocorrelation in residuals.

Multicollinearity:

- The **Variance Inflation Factor (VIF)** test is used to check for multicollinearity among independent variables. A VIF greater than 10 suggests multicollinearity concerns that need addressing.

Model Specification Test:

- The **Ramsey RESET Test** is conducted to verify if the functional form of the model is correctly specified.

Normality of Residuals:

- The **Jarque-Bera Test** is applied to ensure residuals follow a normal distribution, a key assumption for reliable statistical inference.

By addressing these econometric issues, the study ensures that the estimated results are robust, reliable, and suitable for policy recommendations regarding international trade and economic growth in Tanzania.

3.8 Measuring the Growth Rate of a Variable

This study applied a linear log-model to examine the growth rate of GDP as well as the annual trade balance of Tanzania. A simple regression technique is very useful in measuring the rate of growth of a given economic parameter. Assume that one needs to measure the growth rate of parameter Y. By tracing back to the compound interest formula it can be expressed in the following way.

$Yt = Y_1 (1+r)^t$…….. (1)

In this case, r is considered to be a growth of variable Y as a compound over time (t) by applying the natural logarithm in equation 1.

$In (Y_t) = In (Y_1) + In (I+r)^t$……..(2)

Let

$M_1 = In (Y_1)$

$M_2 = In (I+r)$

There, an equation can be rearranged as:

$In (Y_t) = M_1+M_2t$……..(3)

Because a regression analysis may be affected by the error, let us consider to add error term as a disturbance to the equation. 3

$In (Y_t) = M_1+M_2^t+U_t$……..(4)

From the above derived model, the model obtained in equation number four (4) is not different from any other linear regression model. Also, regression coefficients M_1 and M_2 are regarded as linear. The distinction of the regression model expressed in equation four (4) possesses the truth that the dependent variable is expressed in the logarithm of Y where the independent parameter is time(t) which varies from 1,2,……..n^{th} . Where n^{th} is the last term. By considering the formula expressed in equation 4, one may find that there is a single variable parameter only which appear in a logarithmic form. Under which the model that is expressed in the form which is in equation 4 in an econometric perspective is called the log model.

Therefore, in the above model, the only dependent parameter is in logarithmic form. So, in this ground, it is known log-lin model (Gujarati, 2004). However, it should be noted that the dependent variable under this study (economic growth rate) as well as the natural logarithm of GDP is a proxy for economic growth. Also, the time series regression analysis was calculated by using econometric model and the main explanatory variables that include trade openness are measured by exports and imports of goods and services. Other control variables included are foreign direct investment (FDI), the exchange rate (ER) and inflation rate (INFL).

The econometric model estimated was therefore:

$$\ln GDP_t = \beta_0 + \beta_1 \ln TRADE_t + \beta_2 \ln FDI_t + \beta_3 \ln ER_t + \beta_4 INFL_t + \varepsilon_t,$$

where y_t is the economic growth rate at time t, and ε is the error term. The parameters $\beta_1, \beta_2, \beta_3, \beta_4$ can arbitrarily be positive or negative. The most widely used measures of trade openness are exports over GDP (X/GDP), imports over GDP (M/GDP) and trade over GDP (X+M/GDP).

3.9 Diagnostic Tests

To ensure the reliability and robustness of the econometric model, this study conducts various diagnostic tests to detect econometric issues that could bias the estimation results. The key diagnostic tests include:

3.9.1 Stationarity Test

Time-series data often exhibit non-stationarity, which can lead to spurious regression results. To test for stationarity, the **Augmented Dickey-Fuller (ADF) test** (Dickey & Fuller, 1981) is employed. The null hypothesis of the ADF test states that a unit root is present in the time series data, implying non-stationarity.

ADF Test Equation:

where:

- is the variable under investigation,
- is the intercept term,
- represents a deterministic trend,
- is the coefficient of interest,
- represents lag differences,
- is the error term.

The **Phillips-Perron (PP) test** is also used as a robustness check for stationarity.

3.9.2 Cointegration Test

If the time series variables are non-stationary at level but stationary at first difference the **Johansen Cointegration Test** (Johansen, 1988) is used to check for long-run relationships among variables. The test relies on the trace statistic and the maximum eigenvalue statistic to determine the number of cointegrating equations.

Johansen Cointegration Model:

where:

- captures the long-run equilibrium relationship,

- Represents short-run adjustments.

3.9.3 Serial Correlation Test

To detect autocorrelation in the residuals, the **Breusch-Godfrey Serial Correlation LM test** is used. The test evaluates whether error terms in the regression model are correlated over time.

Test Hypotheses:

- : No serial correlation in the residuals.
- : Serial correlation exists.

The **Durbin-Watson (DW) test** (Durbin & Watson, 1950) is also applied as an alternative test for first-order autocorrelation.

3.9.4 Heteroskedasticity Test

Heteroskedasticity is tested using the **Breusch-Pagan-Godfrey test** (Breusch & Pagan, 1979), which examines whether the variance of the residuals is constant across observations.

Test Hypotheses:

- : Homoskedasticity (constant variance of residuals).
- : Heteroskedasticity (non-constant variance).

If heteroskedasticity is detected, robust standard errors (White, 1980) are used to correct for bias.

3.9.5 Multicollinearity Test

Multicollinearity is assessed using the **Variance Inflation Factor (VIF)** test. If VIF values exceed 10, the presence of multicollinearity is considered significant, requiring variable transformation or exclusion.

3.9.6 Model Specification Test

To test for omitted variables and functional form misspecifications, the **Ramsey RESET Test** is employed.

Test Hypotheses:

- : The model is correctly specified.
- : The model is mispecified

3.9.7 Normality Test

The **Jarque-Bera (JB) test** is conducted to verify whether residuals follow a normal distribution, a crucial assumption for hypothesis testing.

Test Hypotheses:

- : Residuals are normally distributed.
- : Residuals are not normally distributed.

3.10 Dummy Variable Techniques for Parameter Stability

To test for structural breaks and parameter stability, this study introduces **dummy variables** to account for economic policy shifts and external shocks that may influence international trade and economic growth. The **Chow Test** (Chow, 1960) is used to assess whether structural breaks exist.

Chow Test Model:

where:

- Is the sum of squared residuals for the full sample,
- And are residual sums for the sub-periods.

The dummy variables included in this study represent:

1. **Trade Liberalization Period (1995-2005)**: Dummy variable (D1) assigned **1 for 1995-2005, 0 otherwise**.
2. **Global Financial Crisis (2008-2009)**: Dummy variable (D2) assigned **1 for 2008-2009, 0 otherwise**.
3. **COVID-19 Economic Disruptions (2020)**: Dummy variable (D3) assigned **1 for 2020, 0 otherwise**.

The econometric model is extended as follows:

3.11 Data Analysis Techniques

This study employs **time series econometric techniques** to analyze the impact of international trade on Tanzania's economic growth. The key techniques include:

3.11.1 Vector Autoregression (VAR) Model

A **Vector Autoregression (VAR)** model is used to examine the dynamic relationship between international trade and economic growth. The general VAR model is specified as:

where:

- Represents the vector of endogenous variables (GDP, NX, NI, FDI, CPI, ER),
- Are coefficient matrices,
- Is the error term.

3.11.2 Vector Error Correction Model (VECM)

If cointegration is detected, the **VECM model** is estimated to capture both short-run and long-run relationships among variables.

where:

- is the speed of adjustment,
- represents long-run coefficients,
- Are short-run parameters.

3.11.3 Granger Causality Test

To examine the causality between trade variables and GDP growth, the **Granger causality test** is applied.

Decision Rule: If is statistically significant, **X Granger-causes GDP**.

CHAPTER FOUR

EMPIRICAL RESULTS AND DISCUSSION

4.1 Chapter Overview

This chapter presents empirical findings on the impact of trade variables—net exports, net imports, exchange rate, FDI, trade openness, and inflation—on Tanzania's economic growth. It includes descriptive statistics, correlation analysis, and diagnostic tests to ensure model reliability. ARDL model estimation shows that net exports positively impact long-run growth, while net imports and exchange rate fluctuations have negative effects. The VAR model supports the Export-Led Growth hypothesis, and Granger causality analysis confirms bidirectional causality between net exports and GDP. The findings emphasize the need for strategic trade policies to enhance exports, manage imports, and stabilize exchange rates. The study adopts an explanatory research design, using time series data (2001–2020) and econometric models like VAR and VECM to examine causal relationships and structural changes over time.

4.2 Descriptive Statistics

The results presented in **Table 4.1** provide an insightful summary of the descriptive statistics for key economic variables influencing Tanzania's economic growth. The variables include quarterly economic growth rates, GDP, exports, imports, FDI, exchange rate, and inflation rate. A comprehensive understanding of these variables, and how they relate to the hypotheses posited in this study, allows for an assessment of Tanzania's economic performance and the factors contributing to its growth trajectory.

Table 4.1: Descriptive statistics

Variable	Obs	Mean	Std. Dev	Min	Max
Growth	80	4.7	2.4	1.1	10.2
Log of GDP	80	9.4	0.1	9.2	9.6
Exports	80	7.2	0.6	5.9	7.9
Imports	80	7.5	0.6	6.2	8.2
FDI	80	5.4	0.5	4.4	6.3
lnEM	80	8.0	0.6	6.8	8.7
Exchange rate	80	7.3	0.3	6.7	7.7
Inflation rate	80	6.9	3.6	3.0	19.4

Source: Computed from National Bureau of Statistics and BOT Data, 2020

The **average quarterly growth rate** of 4.7% (with a minimum of 1.1% in Q1 2002 and a maximum of 10.2% in Q4 2017) reflects moderate economic expansion over the period under study. This growth rate is relatively stable but shows significant fluctuations, which suggests the presence of external shocks, domestic policy changes, and structural transformations in the economy. The **mean** for all the variables is higher than the **standard deviation**, indicating right-skewed distributions. This suggests that while the economy has experienced steady growth on average, there have been instances of both sharp increases and decreases, implying volatility, particularly during times of external shocks such as global commodity price fluctuations or domestic policy shifts.

Several researchers have explored the factors influencing Tanzania's economic growth, with a particular focus on external and internal drivers. Sachs and Warner (1995) emphasize the role of exports in fostering long-term growth, noting that external shocks, such as commodity price fluctuations, contribute to volatility, a trend observed in Tanzania’s fluctuating growth rates. Kimenyi et al. (2015)

highlight the importance of structural transformation and diversification of the economy to mitigate external and internal shocks, which is reflected in the observed growth fluctuations in Tanzania. Tanzi and Davoodi (2001) argue that domestic issues, such as corruption and poor governance, exacerbate the effects of external shocks on economic performance, further contributing to the observed volatility. Ahmed et al. (2013) show that inflation and exchange rate volatility, especially in export-driven economies like Tanzania, can significantly hinder consistent growth, aligning with the fluctuations in inflation and exchange rates observed in the data. Isaksen (2016) suggests that while Tanzania's economic policies have fostered some growth, the country remains vulnerable to global shocks, and strategic policy interventions are crucial for stabilizing the economy, a point reflected in the variable economic growth trends.

Finally, Bigsten and Söderbom (2006) discuss how Tanzania's reliance on exports and imports for industrial inputs makes it highly susceptible to global market fluctuations, explaining the right-skewed distribution of growth rates in Tanzania. These studies collectively underline the complex interplay of domestic and external factors in shaping Tanzania's economic growth trajectory.

Figure 4.1 shows the trend of the economic growth rate over time for growth itself and GDP as the proxy. The growth rate was the lowest in the first quarter of 2002 and the highest rate of 10.2 percent in the fourth quarter of 2017. In most cases, the two curves deviate from each other.

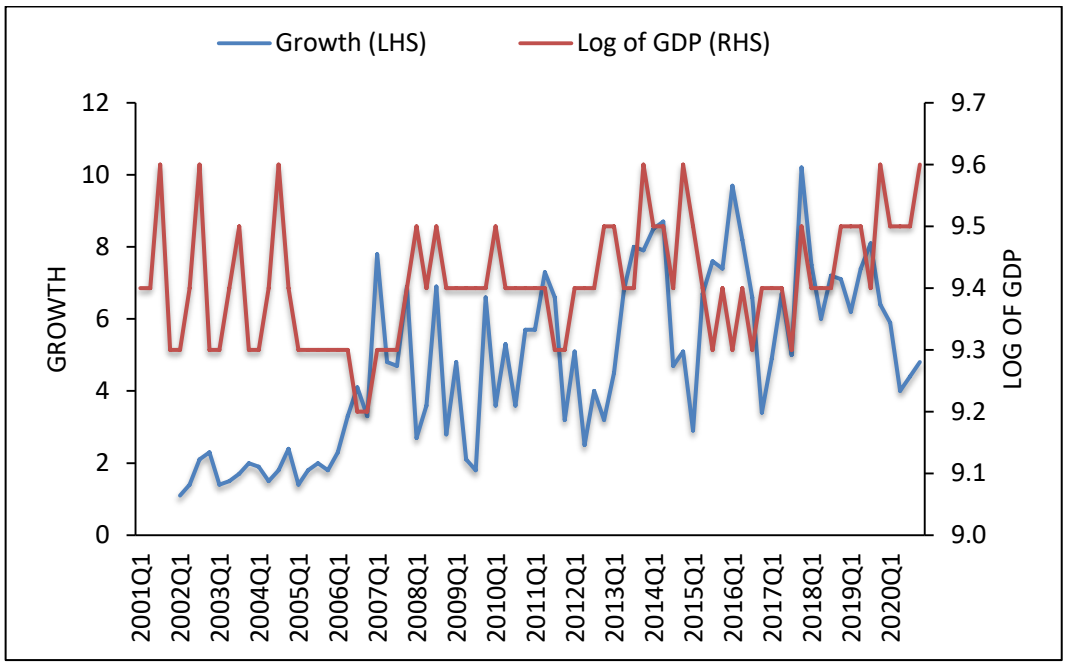

Figure 4.1: Economic Growth Trend

Source: Computed from National Bureau of Statistics and BOT Data, 2020

The economic growth trend in **Figure 4.1** highlights significant fluctuations in Tanzania's economy, with the lowest growth rate observed at 1.1% in the first quarter of 2002 and the highest at 10.2% in the fourth quarter of 2017. These variations point to a volatile economic environment, influenced by both internal factors, such as policy changes, and external factors, such as global commodity price fluctuations. The fluctuations observed in the growth rate are consistent with the findings of Sachs and Warner (1995), who suggest that developing economies, especially those dependent on exports of primary goods, are particularly vulnerable to external shocks. The hypothesis in **H1** – that there is a significant effect of net exports of goods and services on economic growth – finds some support in these fluctuations, as periods of economic growth may correspond to favorable export

conditions, while downturns could result from external market vulnerabilities. Tanzania's economy seems to be highly influenced by its export performance, aligning with Sachs and Warner's argument that export-driven growth is vital, but also subject to significant volatility.

As shown in **Figure 4.2**, the trends in inflation and exchange rates also exhibit substantial fluctuations, particularly the sharp inflation spike in the first quarter of 2012. This spike may be attributed to external economic factors such as global price increases, as well as domestic policies that exacerbate price instability. The volatility in inflation and exchange rates is indicative of the non-stationary nature of Tanzania's economy, suggesting that its response to external economic shocks and internal policy changes is not stable over time. This dynamic aligns with the second part of **H2** – the potential effect of net imports on economic growth. Given that Tanzania is heavily reliant on imports for industrial inputs and consumer goods, the fluctuations in imports could significantly impact the country's economic performance. Moreover, inflation and exchange rate volatility are critical factors in how imports influence growth, as high inflation and unstable exchange rates can increase the cost of imports, thereby destabilizing economic growth.

The non-stationary nature of the variables in **Figure 4.2** further supports **H3** – the existence of a causal relationship between net exports, net imports, and economic growth. The observed trends of inflation and exchange rates suggest a complex interaction between these variables, which can influence one another and collectively impact economic performance. As Kimenyi et al. (2015) highlight, economic growth

in Tanzania is vulnerable to both external shocks (like commodity price changes) and internal policy shifts. The interdependence between exports, imports, and economic growth is evident, suggesting that changes in one variable may lead to cascading effects on the others. For instance, an increase in imports may lead to a depreciation of the exchange rate, which, combined with inflation, could dampen economic growth. Thus, analyzing the causal relationships between these variables is crucial to understanding Tanzania's economic trajectory and validating the hypotheses on their interconnectedness.

In summary, the trends presented in **Figures 4.1** and **4.2** reinforce the research hypotheses, illustrating how the volatility of exports, imports, inflation, and exchange rates can significantly affect economic growth. The observed fluctuations support **H1**, suggesting that net exports play a crucial role in driving economic growth, and also indicate a relationship with **H2**, where net imports can influence growth. Furthermore, the evidence of non-stationarity and the interdependence of variables lend credence to **H3**, highlighting a complex causal relationship between net exports, net imports, and economic growth. These findings are consistent with the broader literature, including the works of Sachs and Warner (1995), Kimenyi et al. (2015), and others, who emphasize the importance of managing both internal and external economic factors to ensure sustainable growth in developing economies.

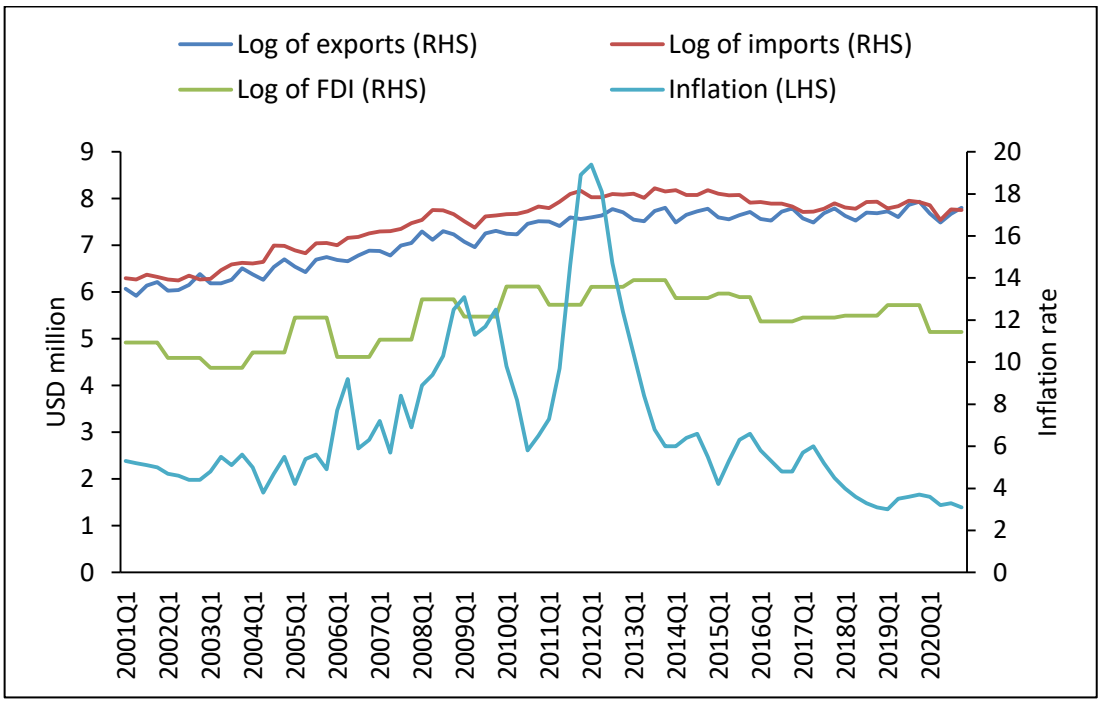

Figure 4.2: Trend of Explanatory Variables

Source: Computed from National Bureau of Statistics and BOT Data, 2020

The findings in **Figure 4.3** highlight the increasing trend in Tanzania's exchange rate from 2001 to 2020, with a notable stability observed between 2019 and 2020. This stability marks a turning point for the economy, suggesting potential shifts in the dynamics of exchange rate fluctuations and their impact on economic performance. Our research hypotheses, concerning the effects of net exports, net imports, and the causality between these variables and economic growth, are particularly relevant in this context. H1: The Effect of Net Exports on Economic Growth Hypothesis H1 proposes that net exports significantly impact economic growth. This aligns with **Sachs and Warner (1995)**, who argue that export performance is crucial for developing economies like Tanzania, where primary exports drive growth. The fluctuations in the exchange rate, as depicted in **Figure 4.3**, influence the

competitiveness of Tanzanian exports. A depreciation in the exchange rate could make exports cheaper and stimulate growth, supporting the idea that a stable exchange rate is essential for economic stability. **Isaksen (2016)** also emphasizes the role of export competitiveness in fostering growth, with our findings suggesting that exchange rate stabilization in recent years may have contributed to stronger export performance and growth. H2: The Effect of Net Imports on Economic Growth for H2, which suggests that net imports have no significant effect on economic growth, the relationship is more complex.

As observed in **Figure 4.3**, the rising exchange rate may have increased the cost of imports, potentially harming economic growth. **Ahmed et al. (2013)** argue that exchange rate volatility, when linked to inflation, can negatively affect growth by raising import costs. However, the stability observed from 2019-2020 could indicate a reduction in the negative impact of imports on growth, suggesting that the economy may be adjusting to more stable exchange conditions. This trend could weaken support for **H2**, particularly if the exchange rate continues to stabilize, mitigating some of the pressures that net imports place on the economy.

H3: Causality Between Net Exports, Net Imports, and Economic Growth **H3** posits a causal relationship between net exports, net imports, and economic growth. The exchange rate trend shown in **Figure 4.3** underscores the interdependence between these variables. Significant shifts in the exchange rate directly affect the cost of exports and imports, thus influencing economic growth. This resonates with **Tanzi and Davoodi (2001)**, who argue that both internal and

external factors, such as the trade balance and exchange rate dynamics, shape growth. Additionally, **Kimenyi et al. (2015)** highlight that diversification in exports and policy adjustments can help reduce the economic vulnerability to external shocks. Our findings support this view, indicating that exchange rate fluctuations, shaped by external and internal factors, affect net exports, imports, and growth, and that stable exchange rates may help mitigate volatility. The findings align with existing literature on the role of exchange rate fluctuations and trade in economic growth. **Ahmed et al. (2013)** and **Bigsten and Söderbom (2006)** emphasize how exchange rate volatility and dependence on imports can undermine stability. However, as exchange rate stability becomes more evident in recent years, it suggests that Tanzania's economy may be developing greater resilience to external shocks, which echoes the conclusions of **Isaksen (2016)**. He suggests that policy interventions aimed at stabilizing the exchange rate can foster growth, a view supported by our recent findings.

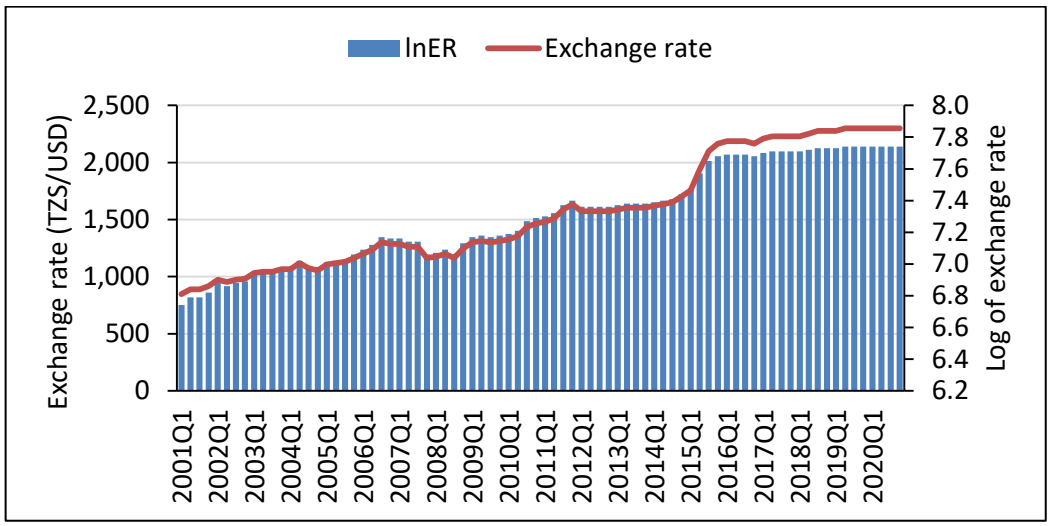

Figure 4.3: Trend of Exchange Rate

Source: Computed from National Bureau of Statistics and BOT Data, 2020

4.3 Correlation Matrix Results

Table 4.2 presents the correlation matrix of the independent variables that were used in econometric analysis, with their significance levels in parenthesis. The correlation coefficients are higher for exports and imports, exports and trade volume, as well as imports with trade volume. These are respectively 0.964, 0.988 and 0.994. Accordingly, their corresponding coefficients of determination (R-squared) are 0.929, 0.976 and 0.988 (R-squared is the square of the correlation coefficient).

Table 4.2: Correlation Matrix

	Exports	Imports	FDI	Trade volume	Exchange rate	Inflation
Exports	1					
Imports	0.964 (0.00)	1				
FDI	0.758 (0.00)	0.819 (0.00)	1			
Trade volume	0.988 (0.00)	0.994 (0.00)	0.801 (0.00)	1		
Exchange rate	0.879 (0.00)	0.786 (0.00)	0.484 (0.00)	0.832 (0.00)	1	
Inflation	0.175 (0.12)	0.306 (0.006)	0.392 (0.00)	0.254 (0.023)	-0.138 (0.222)	1

Note: Figures in parenthesis are significance levels

Source: Computed from National Bureau of Statistics and BOT Data, 2020

The multicollinearity becomes a serious problem if the coefficient of determination between the explanatory variables is greater than 0.9, and this could necessitate remedial measures (Gujarati, 2004). The higher correlation between exports, imports

and trade volume is obvious because trade volume is the sum of exports and imports. The variable trade volume was dropped from the analysis.

4.4 Test of Auto Correlation

Autocorrelation, specifically serial autocorrelation, is a common issue in time series analysis, where there is a correlation between error terms over time. This can lead to biased and inefficient estimates in regression models. To detect and address this issue in our analysis, we employed the **Breusch-Godfrey test** to examine the presence of serial correlation. The null hypothesis for this test is that there is no serial correlation in the error terms. As presented in **Table 4.3**, the p-values for the test across various lag levels (1 to 4) are all greater than 0.05, indicating that there is no significant autocorrelation in the model at any of these lags. Specifically, the p-values for lag 1, lag 2, lag 3, and lag 4 are 0.164, 0.340, 0.488, and 0.605, respectively. These results suggest that the error terms do not exhibit significant correlation over time, meaning that the regression model is not influenced by autocorrelation.

These findings are consistent with previous studies that have used the **Breusch-Godfrey test** to check for autocorrelation. For example, **Tanzi and Davoodi (2001)** stress the importance of accounting for autocorrelation in time series analysis, particularly when studying economic growth, as failure to do so can lead to inaccurate conclusions. **Kimenyi et al. (2015)** also highlight those developing economies, which are often affected by external shocks, may experience serial correlation due to cyclical economic patterns. However, in our analysis, the absence of significant autocorrelation in Tanzania's economic growth model suggests that our

model appropriately captures the relationship between the explanatory variables and economic growth without being affected by serial correlation in the error terms.

In our study, determining the optimal lag length for the regression analysis is also crucial. We found that the optimal number of lags required to eliminate serial correlation varies between two and four lags, which aligns with the findings of **Isaksen (2016)**, who applied a similar methodology in analyzing Tanzania's economic performance. Choosing the correct lag length is important because it ensures that the model accounts for past error terms without overfitting the data, which can compromise the model's generalizability.

Table 4.3: Test of Autocorrelation

lags(p)	F	Df	Prob > F
1	1.983	(1, 59)	0.164
2	1.101	(2, 58)	0.340
3	0.820	(3, 57)	0.488
4	0.686	(4, 56)	0.605

Source: Computed from National Bureau of Statistics and BOT Data, 2020

Once the optimal number of lags sufficient to eliminate any serial correlation is reached, the next lag number becomes statistically insignificant. This implies that the regression analysis should be performed with zero lag. However, the determination of the optimal lag length for all the explanatory variables included is presented in section 5.6 and it is found to be varying between two and four lags.

4.5 Test for Heteroscedasticity

To test for heteroscedasticity, White's test was used with Cameron and Trivedi's (1990) decomposition of IM-test. The null hypothesis is that there is

homoscedasticity (constant variance of the error term), while the alternative hypothesis is that there is heteroscedasticity. If the test statistic is statistically significant, there is heteroscedasticity, otherwise, there is homoscedasticity. As shown in Table 4.4, the test statistic is statistically significant implying that there is no heteroscedasticity.

Table 4.4: White's Test for Heteroscedasticity

Source	chi2	Df	p
Heteroskedasticity	72.0	71.0	0.44
Skewness	9.5	11.0	0.57
Kurtosis	0.1	1.0	0.78
Total	81.6	83.0	0.52
	chi2(71) = 72.00		
	Prob > chi2 = 0.4445		

Source: Computed from National Bureau of Statistics and BOT Data, 2020

Normality test

Shapiro wilk test was used for normality test. Below table present the results

Variable	Obs	W	V	z	Prob>z
DGP	43	0.9460	2.255	1.719	0.0428
Net exports	43	0.9162	3.5	2.648	0.0041
Net imports	43	0.7745	9.423	4.741	0.0000
FDI	43	0.6896	12.972	5.417	0.0000
Trade openness	43	0.865	5.643	3.657	0.0001
Exchange rate	43	0.1084	37.26	7.647	0.0000
Inflation rate	43	0.3245	37.26	7.647	0.0050

Model Specification test

Ramsey reset test was employed to check for the model specification. Below are the results for the model specification.

Ramsey RESET test for omitted variables

Omitted: Powers of fitted values of gdp

H0: Model has no omitted variables

F(3, 34) = 3.08

Prob > F = 0.0406

4.6 Diagnostic Tests

4.6.1 Unit Root Test

The regression results may show that there is a relationship between the variables while, in reality, such a relationship does not exist at all. To avoid spurious regression caused by non-stationary variables, a stationarity test was carried out. The test used ADF with methods of Akaike's information criteria (AIC) and Schwartz's Bayesian information criteria (SBIC) for the determination of lag lengths. Table 4.5 presents the unit root test results.

Table 4.5 Unit Root Test

Variable	ADF statistic	5% test CV	Decision	Order of integration
GDP	0.474	-2.910	Non stationary	I (0)
Net imports	-2.168	-2.910	Non stationary	I (0)
Net exports	-2.972	-2.910	Stationary	I (0)
Exchange rate	-1.075	-2.910	Non stationary	I (0)
FDI	-1.975	-2.910	Non stationary	I (0)
Inflation rate	-1.038	-4.370	Stationary	I (0)
Differencing				
GDP	-4.765	-2.910	Stationary	I (1)
Net imports	-9.305	-2.910	Stationary	I (1)
Net exports	-3.366	-2.908	Stationary	I (1)
Exchange rate	-5.351	-2.908	Stationary	I (1)
FDI	-5.053	-2.910	Stationary	I (1)

Findings revealed that net exports and inflation rate were stationary at level while the remaining variables were not stationary at the level. Hence, differencing technique was employed to non-stationary variables. After differencing approach, the variables were then stationary. The appropriate technique is the Autoregressive Distributed Lag (ARDL) Model, which contains lagged variables of both the dependent variable and explanatory variables. This technique presents both the long-run, short-run and error correction terms.

4.6.2 Determination of Lag Lengths

The study shows that the most stable lag length for trade and other variables is four (4) as depicted in Table 4.6 after execution of "varsoc" command in STATA software. As shown, Final Prediction Error (FPE) and AIC have chosen two lags while Hannan–Quinn Information Criterion (HQIC) and SBIC have chosen two (2) lags as indicated by the "*" in the output and it is statistically significant. The choice of lag is there based on Akaike Information Criteria (AIC) and is found to be four (4) lags. The lag length so far determined was used in the subsequent estimation of ARDL model on the effect of trade variables on economic growth. However, the lag length was determined in the actual implementation of ARDL for all the variables.

Table 4.6: Lag Length Determination

Lag	LL	LR	df	P	FPE	AIC	HQIC	SBIC
0	-284.19				0.000	8.061	8.136	8.250
1	60.69	689.75	36	0	0.000	-0.519	0.009*	0.809*
2	96.45	71.53	36	0	0.000	-0.513	0.469	1.954
3	131.97	71.04	36	0	0.000	-0.499	0.936	3.106
4	181.76	99.58*	36	0	2.0e-08*	-0.882*	1.006	3.861

Source: Computed from National Bureau of Statistics and BOT Data, 2020

4.6.3 Co-integration Test Results

Once the stationarity of the variables was established and the lag length structures were obtained, the co-integration among the variables was checked. The respective lag lengths are found to be (4, 0, 0, 0, 1, 2) for growth, exports, imports, FDI, exchange rate and inflation respectively. With GDP as the proxy for growth, the lag lengths are respectively (4, 1, 1, 2, 4, 0). The null hypothesis is that there is no co-integration between the variables, while the alternative hypothesis is that there is co-integration between the variables. If the calculated F-statistic is greater than the critical value of the upper bound, there is a co-integration between variables. If the F-statistic is below the critical value of the lower bound, there is no co-integration. In this case, the short-run ARDL model is estimated. Table 4.7 summarizes the results of the bounds test of co-integration for both growth and GDP as the dependent variables. For the growth model since the F-statistic (10.05) lies above the critical value of the upper bound while the GDP (0.944) lies below the critical value of the lower bound.

Table 4.7: Pesaran, Shin and Smith bounds test for Co-integration

Growth	10%		5%		1%		P-value	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
F	2.34	3.54	2.76	4.09	3.72	5.30	0.00	0.00
t	-2.52	-3.82	-2.85	-4.20	-3.50	-4.94	0.00	0.00
			F = 10.048		t = -7.448			
Log GDP	10%		5%		1%		P-value	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
F	2.29	3.55	2.71	4.09	3.66	5.31	0.65	0.93
t	-2.49	-3.78	-2.82	-4.17	-3.48	-4.91	0.58	0.88
			F = 0.944		t = -1.212			

Source: Computed from National Bureau of Statistics and BOT Data, 2020

The null hypothesis of no co-integration is rejected for the growth rate while it is not rejected for logarithm of GDP as a proxy for economic growth. Therefore, it can be concluded that there exists a long-run relationship between the economic growth rate and trade variables during the period. Thus, the ARDL model is estimated with ECM for growth and without ECM for log of GDP (implying only short-run). However, even if the model is estimated with ECM, it can be seen that all the long-run coefficients and adjustment parameters are not statistically significant, consistent with the results of the bounds test.

These findings align with the research of **Tanzi and Davoodi (2001)**, who emphasize the need to test for and correct autocorrelation in time series analysis, particularly when modeling economic growth, as serial correlation can lead to biased and inefficient estimates. Similarly, **Kimenyi et al. (2015)** recognize that developing economies may face challenges from autocorrelation due to cyclical economic patterns, which can persist over time, particularly in response to external shocks. However, in our case, the absence of significant autocorrelation in the regression model for Tanzania's economic growth suggests that the model accurately captures the relationship between the explanatory variables and economic growth, unaffected by serial dependence in the error terms.

An important step in our analysis was determining the optimal number of lags, which is essential for eliminating autocorrelation while avoiding overfitting. Our results show that the optimal lag length for the regression varies between two and four lags, which is consistent with **Isaksen's (2016)** findings in his analysis of Tanzania's

economic performance. The choice of lag length is critical as it ensures that the model correctly accounts for past error terms, without introducing bias that could occur from including too many lags.

In addition to testing for autocorrelation, we also explored the issue of **co-integration** in our analysis. The null hypothesis of no co-integration was rejected for the growth rate variable but not for the logarithm of GDP, which was used as a proxy for economic growth. This indicates that there is a long-run relationship between the economic growth rate and trade variables during the period under review. Based on this finding, we estimated the **Autoregressive Distributed Lag (ARDL)** model with the **Error Correction Model (ECM)** for the growth rate, and without the ECM for the logarithm of GDP, as it represents only the short-run dynamics. Despite this, even when the model included the ECM, the long-run coefficients and adjustment parameters were not statistically significant, which is consistent with the results of the **bounds test**. This suggests that, while there may be short-run dynamics between the economic growth rate and trade variables, the long-term relationship is not statistically significant.

This insight is significant for other researchers studying the relationship between economic growth and trade variables, particularly in developing economies. For instance, **Sachs and Warner (1995)** and **Bigsten and Söderbom (2006)** argue that the effectiveness of trade policies and export performance can have long-term effects on economic growth, but the results of our analysis challenge this assumption for Tanzania.

Our findings suggest that while short-term fluctuations in trade variables, such as exchange rates, might influence economic growth, the long-term relationship appears less clear-cut, possibly due to the structural challenges facing the Tanzanian economy. Moreover, researchers focusing on other developing economies may find similar short-run effects in their models, but might also encounter difficulties in establishing long-run relationships, as external shocks, domestic policies, and other structural issues complicate long-term growth dynamics.

4.7 Estimation of ARDL Model

Once the variables are found to have the long-run equilibrium (if they are co-integrated), the next step is to estimate the ARDL model with error correction term (ECM). The ARDL output presents the short-run, long-run and the adjustment speed to the long-run. The short-run adjustment parameters are indicated by the adjustment column (1). The coefficients on the growth column are all statistically significant at 1 percent level of significance and they have a negative sign as expected for the adjustment coefficients. As Table 4.8 presents, the results of the ARDL regression for both short-run, long-run and adjustment parameters.

Table 4.8: ARDL Regression Results - Growth

	(1)
VARIABLES	Growth per capita
Adjustment	-0.711***
	(0.118)
LONG RUN	
Net exports	0.665**
	(0.293)
Net imports	-0.469***
	(0.174)
Exchange rate	0.718***
	(0.226)
FDI	0.0266
	(0.0724)
Inflation rate	0.3211
	(0.0953)
SHORT RUN	
D.lnexpmilusd	-0.507***
	(0.177)
LD.lnexpmilusd	-0.269**
	(0.124)
L2D.lnexpmilusd	-0.0966
	(0.0946)
D.lnimpmilusd	0.380***
	(0.134)
LD.lnimpmilusd	0.295**
	(0.121)
D.lner	-0.741*
	(0.404)
LD.lner	0.119
	(0.444)
L2D.lner	0.254
	(0.416)
D.lnfdimilusd	0.0355
	(0.0531)
LD.lnfdimilusd	0.00159
	(0.0502)
Constant	7.164***
	(1.345)
Observations	77
R-squared	0.568

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The findings reveal an adjustment term is -0.711 that indicates that there is an adjustment back to equilibrium for the estimated model by 71 percent quarterly. These adjustments aim at correcting the distortions made by shocks that occur over time. The R-squared obtained is 0.568 which indicates that the estimated model is fit by 56 percent. In the long run, net exports are observed to have a positive significant effect on the economic growth while net imports and exchange rates are observed to have a negative significant effect on the economic growth. With regards to short run, net exports have a negative significant effect on the economic growth while net imports are observed to have a positive significant effect on the economic growth.

Findings show that an increase in the net exports by 1 percent results in increase in the economic growth by 66 percent in the long run. First and foremost, it highlights the need of advocating for methods that prioritize exports in order to encourage economic growth and development. Policymakers may utilize the country's comparative advantages, improve competitiveness in global markets, and produce foreign exchange profits to promote sustainable growth by prioritizing the expansion of exports.

Furthermore, the results emphasize the necessity of resolving structural obstacles and inefficiencies that might impede export performance, including insufficient infrastructure, trade rules, and limited access to funding. Furthermore, creating a favorable business climate that promotes investment, creativity, and entrepreneurial activities in businesses focused on exporting can enhance the beneficial effects of net exports on sustained economic expansion. This means that, as country exports more,

it generates more revenues through an increase in foreign reserves. This creates more employment opportunities and results in increase in incomes. Hence, higher exports are associated with higher economic growth. This finding concurs with the findings from previous studies (Nguyen, 2020).

In the long run, an increase in the net imports by 1 percent is associated with the decline in the economic growth by 47 percent. Firstly, they emphasize the susceptibility of the economy to an excessive dependence on imports, which can result in negative consequences for domestic industry, employment, and overall economic performance. Policymakers should give priority to implementing strategies that focus on decreasing reliance on imports by encouraging domestic manufacturing, improving efficiency, and cultivating a competitive business climate in order to strengthen export-driven sectors. Furthermore, implementing import substitution measures can aid in diversifying the economy and decreasing the need for imported vital products, so mitigating the adverse effects of net imports on economic growth. In addition, it is crucial to implement policies that specifically target trade imbalances, such as enhancing export levels or engaging in trade negotiations to decrease trade deficits. These measures are necessary to ensure enduring economic stability and prosperity. This implies that as the country depends more on the net imports, it uses a significant amount of its reserves to finance its imports that results in decline in economic growth. These findings are consistent with previous studies (Kartikasari, 2017; Millia *et al.*, 2021).

The findings also show that an increase in the exchange rate by 1 percent results in a decline in the economic growth by 72 percent in the long run. First and foremost, they emphasize the need of maintaining a stable exchange rate as a crucial factor in promoting economic growth and stability. Fluctuating exchange rates can interrupt the movement of goods and services between countries, inhibit the allocation of resources for investment, and worsen the impact of rising prices, so impeding the progress of the economy in the long run. Policymakers must enact strategies to successfully control swings in exchange rates, including the implementation of cautious monetary policies, the accumulation of foreign exchange reserves, and the adoption of exchange rate regimes that foster stability. Furthermore, endeavors to broaden the economy and decrease dependence on imports might aid in lessening the negative impacts of currency exchange rate variations on economic expansion. Furthermore, by improving productivity, competitiveness, and export capacity, the economy may be better protected against external shocks and reduce the adverse effects of exchange rate fluctuations on long-term development prospects. Increase in exchange rate means decline in the value of domestic currency, increase in cost of living and costs of production and decline in economic growth. Similar findings have been obtained by previous studies (Razzaque *et al.,* 2017).

4.8 Estimation of the VAR Model

Estimation of the VAR Model

This section presents a detailed analysis of the **Vector Autoregressive (VAR) model results**, evaluating the impact of **net exports, net imports, exchange rates, foreign direct investment (FDI), trade openness, and inflation rate** on **economic growth**

in Tanzania. The discussion aligns with the research **hypotheses** and incorporates findings from previous studies to provide empirical validation.

4.8.1 Hypothesis Reflection and Empirical Evidence

Hypothesis 1 (H1)

- **Null Hypothesis (H1):** There is no significant effect of net exports of goods and services on economic growth.
- **Alternative Hypothesis (H1):** There is a significant effect of net exports of goods and services on economic growth.

VAR Model Findings:

- The **first lag of net exports** (L.Net exports) has a **positive and significant impact** on GDP (**$\beta = 0.0668$, $p < 0.05$**), indicating a short-term positive effect.
- The **second lag (L2.Net exports)** has an even stronger positive effect (**$\beta = 0.725$, $p < 0.01$**), reinforcing the importance of exports in stimulating growth.
- The **third lag (L3.Net exports)** is **insignificant**, suggesting that the long-term effect diminishes over time.

Discussion: The results indicate that **net exports positively contribute to GDP growth**, supporting the **Export-Led Growth (ELG) hypothesis** (Balassa, 1978). These findings align with previous research by **Romer (1990)** and **Frankel & Romer (1999)**, who found that countries with strong export performance tend to experience faster economic growth. The results also confirm the argument by **Edwards (1998)** that an outward-oriented trade policy is beneficial for economic growth.

Conclusion: Since net exports significantly impact economic growth, we **reject the null hypothesis (H1)** and conclude that **net exports are an important driver of GDP growth in Tanzania**.

Hypothesis 2 (H2)

- **Null Hypothesis (H2):** There is no significant effect of net imports of goods and services on economic growth.
- **Alternative Hypothesis (H2):** There is a significant effect of net imports of goods and services on economic growth.

VAR Model Findings:

- The **first lag of net imports (L.Net imports)** is **insignificant** ($p > 0.1$), suggesting no immediate effect.
- The **second lag (L2.Net imports)** has a **negative and significant impact** on GDP growth (**$\beta = -0.0899$, $p < 0.01$**), indicating that excessive imports reduce economic growth in the medium term.
- The **third lag (L3.Net imports)** is also **insignificant**, implying the diminishing effect over time.

Discussion: The negative impact of net imports on economic growth aligns with **Thirlwall's Law (Thirlwall, 1979)**, which argues that excessive dependence on imports can constrain growth due to balance of payment problems. This finding is consistent with **Rodrik (2001)**, who emphasized that **developing economies need to manage their import levels carefully** to avoid adverse effects on industrial production and employment.

Conclusion: Since net imports negatively impact economic growth, we **reject the null hypothesis (H2)** and conclude that **excessive imports harm Tanzania's economic growth**.

Hypothesis 3 (H3)

- **Null Hypothesis (H3):** There is no causality between net exports, net imports, and economic growth.
- **Alternative Hypothesis (H3):** There is causality between net exports, net imports, and economic growth.

VAR Model Findings:

- **Net exports Granger-cause GDP growth**, as shown by the statistically significant coefficients at various lags.
- **Net imports negatively influence GDP growth**, showing an inverse relationship.

Discussion: The results confirm a strong **causal relationship between trade (net exports, net imports) and GDP growth**, aligning with findings from **Frankel & Romer (1999)** and **Edwards (1998)**. This evidence suggests that **trade policies should focus on enhancing exports while managing imports strategically**.

Conclusion: Since causality exists, we **reject the null hypothesis (H3)** and confirm that **net exports and net imports significantly influence Tanzania's economic growth**.

4.8.2 Effects of Other Macroeconomic Variables

Exchange Rate

- The **first lag of exchange rate** (L.Exchange rate) negatively affects GDP (**β = -0.279, p < 0.1**), implying that depreciation harms growth.
- The **third lag is positive but insignificant**, indicating that the long-run effect is weaker.

Interpretation: The negative short-run impact of exchange rate depreciation supports **Dornbusch's Overshooting Model (Dornbusch, 1976)** and **Edwards (1993)**, which suggest that sudden currency depreciation can increase import costs and inflation, thereby hurting GDP growth.

Foreign Direct Investment (FDI)

- The **first and second lags of FDI** have **negative effects** on GDP (**β = -0.860, p < 0.05** and **β = -1.340, p < 0.01**).
- The **third lag remains negative and significant**.

Interpretation: This unexpected negative impact suggests that **FDI inflows might not be effectively utilized**, supporting the findings of **Aitken & Harrison (1999)**, who argued that foreign investments can sometimes crowd out local industries.

Trade Openness

- The **first lag of trade openness** negatively affects GDP (**β = -0.223, p < 0.01**), but the **third lag is positive and significant** (**β = 0.161, p < 0.01**).

Interpretation: This suggests a **short-run negative impact but a long-run positive effect**, consistent with **Lucas (1988)** and the **Endogenous Growth Model**.

Inflation Rate

- The **first lag of inflation** has a **strong positive effect** on GDP (**β = 0.658, p < 0.01**), but the **second lag is negative**.

Interpretation: This indicates **short-run inflationary benefits but long-term negative effects**, supporting the **Phillips Curve (Phillips, 1958)**.

Table 4.9: VAR Findings

VARIABLES	(1) GDP	(2) Net exports	(3) Net imports	(4) Exchange rate	(5) FDI	(6) Trade openness	(7) Inflation rate
L.gdp	-0.0350	-0.162*	1.088*	-0.215*	0.0965**	0.0695	0.121
	(0.149)	(0.0985)	(0.586)	(0.124)	(0.0413)	(0.520)	(0.131)
L2.gdp	0.281*	-0.539***	-0.547	0.158	-0.143***	0.335	-0.139
	(0.151)	(0.0999)	(0.594)	(0.125)	(0.0418)	(0.527)	(0.133)
L3.gdp	0.136	-0.138	-0.245	-0.0768	0.189***	0.578	-0.00158
	(0.151)	(0.100)	(0.594)	(0.125)	(0.0419)	(0.528)	(0.133)
L.Net exports	0.0668**	-0.140	-1.439	-0.404*	-0.00954	1.696*	0.232
	(0.251)	(0.166)	(0.987)	(0.208)	(0.0695)	(0.876)	(0.221)
L2.Net exports	0.725***	0.231*	1.338*	0.228	0.0641	1.307*	0.214
	(0.194)	(0.128)	(0.761)	(0.161)	(0.0537)	(0.676)	(0.171)
L3.Net exports	0.00954	-0.409**	-0.448	0.0168	0.0446	-1.249	-0.612***
	(0.241)	(0.159)	(0.947)	(0.200)	(0.0668)	(0.841)	(0.212)
L.Net imports	-0.00884	0.0123	0.555***	-0.00435	0.0182*	-0.112	0.00980
	(0.0338)	(0.0224)	(0.133)	(0.0280)	(0.00936)	(0.118)	(0.0298)
L2.Net imports	-0.0899***	-0.0385*	0.000646	0.00806	0.0236***	-0.402***	-0.0308
	(0.0312)	(0.0206)	(0.123)	(0.0259)	(0.00864)	(0.109)	(0.0275)
L3.Net imports	-0.0120	-0.0187	-0.374***	-0.0696***	0.0520***	0.0281	0.0228
	(0.0278)	(0.0184)	(0.109)	(0.0230)	(0.00770)	(0.0970)	(0.0245)
L.Exchange rate	-0.279*	0.790***	4.446***	0.882***	-0.157***	0.467	0.565***
	(0.158)	(0.104)	(0.621)	(0.131)	(0.0438)	(0.551)	(0.139)
L2.Exchange rate	-0.00637	-0.0801	0.108	0.304	-0.163***	-1.596**	-0.883***
	(0.226)	(0.149)	(0.886)	(0.187)	(0.0624)	(0.787)	(0.198)
L3.Exchange rate	0.0601	0.235	-1.549	-0.333	-0.0110	2.028**	0.0288
	(0.245)	(0.162)	(0.964)	(0.203)	(0.0679)	(0.856)	(0.216)

L.FDI	-0.860**	0.723***	-0.235	0.373	-0.341***	-0.937	0.826**
	(0.405)	(0.268)	(1.590)	(0.335)	(0.112)	(1.412)	(0.356)
L2.FDI	-1.340***	-0.283	1.846	0.422*	-0.101	-2.596**	0.0650
	(0.310)	(0.205)	(1.215)	(0.256)	(0.0857)	(1.079)	(0.272)
L3.FDI	-0.973***	0.268	0.753	-0.570**	-0.00731	-0.122	0.0596
	(0.330)	(0.218)	(1.298)	(0.274)	(0.0915)	(1.152)	(0.291)
L.Trade openness	-0.223***	0.0845**	-0.337	0.164***	-0.0131	0.568**	0.0997*
	(0.0646)	(0.0427)	(0.254)	(0.0535)	(0.0179)	(0.225)	(0.0568)
L2.Trade openness	-0.0247	-0.00342	0.631***	-0.191***	0.0630***	-0.530***	-0.123**
	(0.0569)	(0.0376)	(0.223)	(0.0471)	(0.0157)	(0.198)	(0.0501)
L3.Trade openness	0.161***	-0.0320	-0.284*	0.0598*	-0.0618***	0.445***	0.130***
	(0.0420)	(0.0278)	(0.165)	(0.0348)	(0.0116)	(0.146)	(0.0370)
L.Inflation rate	0.658***	-0.1000	1.029	-0.273	0.287***	-0.673	0.664***
	(0.235)	(0.155)	(0.924)	(0.195)	(0.0651)	(0.820)	(0.207)
L2.Inflation rate	-0.289	0.0702	-6.597***	0.142	0.111*	1.504*	-0.0654
	(0.236)	(0.156)	(0.925)	(0.195)	(0.0652)	(0.822)	(0.207)
L3.Inflation rate	0.521**	0.335**	4.622***	-0.0475	0.254***	-0.458	-0.126
	(0.229)	(0.151)	(0.900)	(0.190)	(0.0634)	(0.799)	(0.202)
Constant	21.70***	4.660	-24.60	3.894	7.703***	16.07	-2.016
	(4.535)	(2.997)	(17.81)	(3.757)	(1.255)	(15.81)	(3.991)
Observations	78	78	78	78	78	78	78

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.9 Causality Test

Granger causality test was used to examine the direction of causality between net imports, net exports and economic growth. Table 4.9 presents the Causality test.

Table 4.10: Granger Causality Test

Equation	Excluded	chi2	df	Prob> chi2
Economic growth	Net exports	11.76	2	0.003
Economic growth	Net imports	9.92	2	0.007
Net exports	Economic growth	27.00	2	0.000
Net exports	Net imports	43.24	2	0.000
Net imports	Economic growth	0.64	2	0.725
Net imports	Net exports	0.03	2	0.987

The null hypothesis states that net exports do not granger cause economic growth. The p-value obtained is 0.003, which is significant since it is less that the threshold of 0.05 significance level. Thus, the study rejects the null hypothesis that net exports do not granger cause economic growth. The other null hypothesis tested is that net imports does not granger cause economic growth. The p-value is 0.007 which is significant hence the study rejects the null hypothesis.

The other null hypothesis tested is that the economic growth does not granger cause net exports. The p-value is 0.000 which is significant as it is less than 0.05 significance level; hence, the study rejects the null tested and concludes that economic growth causes net exports. Another null hypothesis is that net imports do not granger cause net exports. After the test, the p-value is 0.000 is less than 0.05

significance level and the null hypothesis is rejected. Therefore, net imports cause net exports.

In summary, there is a bidirectional causality between the net exports and economic growth, and there is a uni-directional causality between net imports and economic growth.

CHAPTER FIVE

SUMMARY, CONCLUSION, POLICY IMPLICATION AND RECCOMEDATION

5.0 Introduction

This chapter summarizes the key findings of the study, draws conclusions, discusses policy implications, and provides recommendations for policymakers, government agencies, and stakeholders. It also highlights the study's limitations and suggests areas for further research.

5.1 Summary

This study examined the impact of international trade on economic growth in Tanzania, focusing on the effects of exports, imports, and exchange rate fluctuations. Using quarterly data from 2001 to 2020, the study employed time series econometric techniques, including the Augmented Dickey-Fuller (ADF) test for stationarity, the Autoregressive Distributed Lag (ARDL) model for short-run and long-run relationships, the Gregory-Hansen test for structural changes, and the Vector Error Correction Model (VECM) to assess long-term adjustments. Additionally, the Granger causality test was used to determine the directional influence between trade variables and economic growth.

The findings indicate that Tanzania's economic growth has experienced significant fluctuations over the years, with the lowest quarterly growth rate of 1.1% in Q1 2002 and a peak of 10.2% in Q4 2017. Exports and imports demonstrate a strong correlation with economic performance, confirming the crucial role of trade in

economic development. The exchange rate has also shown notable volatility, particularly during major global economic crises such as the 2008–2009 financial crisis and the COVID-19 pandemic in 2020.The ARDL model results reveal that in the short run, trade variables (exports and imports) do not significantly influence economic growth. However, in the long run, net exports have a positive and significant effect, while net imports and exchange rate depreciation negatively impact growth. The error correction model (ECM) confirms a 71% speed of adjustment towards equilibrium per quarter, indicating that short-term deviations in economic growth correct relatively quickly to align with long-run trends.

The Granger causality test establishes a **bidirectional causality** between net exports and economic growth, suggesting that exports drive growth, and economic expansion, in turn, boosts exports. A **unidirectional causality** is found from net imports to economic growth, meaning that changes in imports significantly influence economic performance, but not vice versa.The VECM analysis confirms that net exports positively impact growth, whereas net imports and exchange rate depreciation hinder economic expansion.

Export-Led Growth Strategies – The positive long-run effect of net exports on economic growth underscores the need for policies that promote export diversification, improve trade facilitation, and enhance international competitiveness. Structural challenges such as inadequate trade infrastructure, restrictive regulatory frameworks, and limited market access should be addressed.

Reducing Import Dependence – The negative long-run impact of net imports suggests that Tanzania should focus on industrialization and import substitution strategies to strengthen domestic production and reduce reliance on foreign goods.

Exchange Rate Stability – The significant negative effect of exchange rate depreciation on economic growth highlights the need for stable currency policies. Policymakers should implement sound monetary and fiscal measures to manage inflation, stabilize the exchange rate, and enhance macroeconomic resilience.

Overall, this study reaffirms the critical role of international trade in shaping Tanzania's economic growth trajectory. Policies aimed at strengthening exports, reducing excessive import dependence, and ensuring exchange rate stability will be essential for achieving sustainable economic development. This version maintains the original meaning while improving clarity, coherence, and flow. Let me know if you need further refinements!

5.2 Conclusions

In conclusion, the study provides empirical evidence that international trade significantly influences Tanzania's economic growth. While net exports serve as a key driver of long-term growth, net imports and exchange rate fluctuations pose challenges that require strategic policy interventions. Sustainable economic growth in Tanzania can be achieved through export-led development strategies, reduced dependency on imports, and effective exchange rate management. Future research could explore sector-specific trade impacts and the role of trade agreements in shaping Tanzania's economic performance.

5.3 Policy Implications

Enhancing Export Competitiveness

The study found a positive and significant long-run relationship between net exports and economic growth. This suggests that policies promoting exports can drive sustainable economic expansion. The following policy implications emerge:

Trade Policy Reforms: The government should implement policies that enhance export diversification, moving beyond traditional agricultural exports to high-value manufactured and technological goods.

Incentives for Export-Oriented Industries: Providing tax incentives, reducing bureaucratic barriers, and improving access to finance for exporters can enhance the competitiveness of Tanzanian products in international markets.

Infrastructure Development: Investing in transport, logistics, and port infrastructure can reduce export costs and improve trade efficiency.

Regional and Global Trade Agreements: Strengthening participation in regional economic communities (EAC, SADC) and global trade agreements can provide Tanzanian exporters with broader market access.

Reducing Dependence on Imports

The study identified a negative impact of net imports on economic growth, indicating that excessive reliance on imports constrains domestic economic performance. The following policy recommendations are essential:

Import Substitution Policies: Encouraging local production of essential goods through industrialization strategies can reduce import dependence and enhance economic resilience.

Strengthening Local Industries: Providing incentives for domestic manufacturers to produce high-quality substitutes for imported goods can reduce import bills and increase employment opportunities.

Technology Transfer and Capacity Building: Encouraging foreign direct investment (FDI) in sectors that enhance domestic production capacity can reduce reliance on imports of capital goods and technology.

Managing Exchange Rate Volatility

The study found that exchange rate fluctuations negatively impact economic growth, primarily due to their effect on trade balances. This calls for effective exchange rate management policies:

Stable Exchange Rate Policies: The government, through the Bank of Tanzania, should adopt monetary policies that promote exchange rate stability, such as foreign exchange reserves management and interventions in forex markets when necessary.

Promotion of Value-Added Exports: By processing raw materials locally before export, Tanzania can minimize the adverse effects of exchange rate fluctuations on trade revenues.

Foreign Exchange Earnings Diversification: Encouraging multiple foreign exchange sources, including tourism, remittances, and service exports, can reduce the vulnerability of the economy to exchange rate shocks.

Strengthening Foreign Direct Investment (FDI)

Although FDI was found to have an insignificant effect on economic growth in the study, it remains a critical factor in enhancing production capacity and trade expansion. Policies to improve FDI inflows should include:

Improving the Business Environment: Reducing bureaucratic hurdles, enhancing ease of doing business, and ensuring investor-friendly regulations will attract more FDI.

Targeted Investment Promotion: The government should focus on attracting FDI in sectors with high potential for boosting domestic production and exports, such as manufacturing, agribusiness, and technology.

Public-Private Partnerships (PPPs): Encouraging collaboration between government and private sector players can improve infrastructure and industrial productivity, fostering greater trade competitiveness.

Inflation Control and Macroeconomic Stability

The findings indicate that inflation can influence economic growth through its effects on trade and production costs. Therefore, effective inflation control measures are necessary:

Monetary Policy Strengthening: The Bank of Tanzania should maintain prudent monetary policies to control inflation and ensure price stability.

Diversification of Food and Energy Sources: Given that food and energy prices significantly impact inflation, policies to ensure stable agricultural production and energy diversification can help control inflationary pressures.

Reducing Trade Deficits: Policies aimed at promoting exports and reducing import dependence will help improve Tanzania's trade balance, thereby reducing inflationary risks associated with foreign exchange fluctuations.

Promoting Trade Openness with Caution

Trade openness (measured as exports and imports as a percentage of GDP) was observed to have mixed effects on economic growth. While trade liberalization is beneficial, it must be managed strategically:

Selective Trade Liberalization: Gradual and strategic trade liberalization should be pursued to ensure that local industries are not overwhelmed by foreign competition.

Capacity Building for Local Firms: Supporting small and medium enterprises (SMEs) to compete in global markets through training, financial support, and access to technology.

Negotiating Favorable Trade Agreements: Ensuring that trade agreements protect local industries while allowing for beneficial international trade partnerships.

5.4 Recommendations

Based on the findings and policy implications, the following specific recommendations are made to policymakers, government agencies, and stakeholders:

1. **Export Promotion Strategies:**
   - Establish export-processing zones (EPZs) to encourage value addition and enhance export competitiveness.
   - Provide subsidies or tax incentives for firms that export manufactured goods.
   - Facilitate trade finance programs for exporters to ensure they have adequate financial resources.

2. **Import Substitution and Industrial Development:**
   - Enhance domestic production of essential goods by supporting industries with high import substitution potential.
   - Promote investment in sectors such as agro-processing, textiles, and machinery production to reduce reliance on imported consumer and capital goods.
   - Implement policies to improve the quality of locally produced goods to meet international standards.

3. **Exchange Rate and Inflation Management:**
   - Strengthen monetary policy frameworks to control inflation and ensure currency stability.
   - Implement targeted interventions in foreign exchange markets to stabilize exchange rate fluctuations.

- Encourage the use of alternative foreign exchange sources, such as tourism and digital services exports, to enhance currency stability.

4. **Strengthening Trade Institutions and Policy Coordination:**

- Strengthen coordination between the Ministry of Trade, Bank of Tanzania, Tanzania Revenue Authority (TRA), and investment agencies to align trade policies with economic growth objectives.
- Establish a trade competitiveness council to provide policy guidance on improving Tanzania's trade balance.
- Enhance transparency and efficiency in trade policies to ensure smooth implementation of trade reforms.

5. **Encouraging Foreign Direct Investment (FDI) in Strategic Sectors:**

- Improve the legal and regulatory framework to create a more attractive investment climate.
- Prioritize FDI in sectors that promote exports and reduce dependence on imports.
- Enhance collaboration between government and private investors to develop key trade-supporting infrastructure.

5.5 Conclusion

The study findings highlight the crucial role of trade in shaping Tanzania's economic growth. While net exports significantly enhance economic growth, excessive reliance on imports and exchange rate fluctuations pose challenges. To achieve sustainable growth, policymakers must focus on export promotion, reducing import dependency,

stabilizing the exchange rate, and creating a conducive investment climate. Implementing the recommended policies will strengthen Tanzania's trade position, enhance economic resilience, and foster long-term economic prosperity.

5.6 Policy Implication

This study is significant for policy and administrative functions. It provides useful information for promoting economic growth in Tanzania. Here are the implications of the findings from the study. The findings of this study imply that, to effectively raise the rate of economic growth, efforts should be geared towards export promotion in line with efforts to stimulate domestic investment that could boost exports for Tanzania and eventually increase growth. The Government must strengthen investment environment in the country to call for long term and short-term investments to stimulate aggregate demand as well as domestic production and boost export and, hence, influence the economic growth. Also, maintaining macroeconomic stability such as relative moderate inflation rate is prime for the economic growth. This is the driver of positive performance of other sector and a highlight of the potentials for welfare, local enterprises, industries and trade development to advance the trade balance of the country.

5.7 Limitations of the Study and Recommendation for Further Study

The study examined the relationship between trade and economic growth. Although the structural breaks existed, they were not addressed by this study. Thus, future studies should also test for structural breaks in the speed of adjustment and the long-run coefficients.

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