



ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

TRADE LIBERALIZATION AND ECONOMIC GROWTH IN EASTERN AFRICA

*A Thesis Submitted to the Department of Economics of Addis Ababa
University in Partial Fulfillment of the Requirements of Degree for
Master of Science in Economics (Economic Policy Analysis)*

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DECLARATION

We, the undersigned, declare that this thesis titled "TRADE LIBERALIZATION AND ECONOMIC GROWTH IN EASTERN AFRICA" is the original work of the student Bayeetti Alemayehu, and it has not been submitted in any form to any other university or institution for the award of any degree or diploma.

All sources of materials and data used in the thesis have been properly acknowledged. The thesis has been carried out under the supervision of the undersigned advisor and is submitted in partial fulfillment of the requirements for the degree of Master of Science in Economics (Economic Policy Analysis) at Addis Ababa University.

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CERTIFICATION

This is to certify that the thesis entitled "TRADE LIBERALIZATION AND ECONOMIC GROWTH IN EASTERN AFRICA" submitted to Addis Ababa University, in partial fulfillment of the requirements for the award of the degree of Master of Science in Economics (Economic Policy Analysis), is a record of original work carried out by Bayeetti Alemayehu, under the supervision of Habtamu Adane (Ph.D.) complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

The work embodied in this thesis has not been submitted, in whole or in part, for any other degree or diploma in this or any other institution. We further certify that all necessary corrections and modifications suggested by the thesis examination committee have been incorporated into the final version of the thesis.

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LIST OF ACRONYMS

AfCFTA	African Continental Free Trade Area
ARDL	Autoregressive Distributed Lag
COMESA	Common Market for Eastern and Southern Africa
DOLS	Dynamic Ordinary Least Squares
EAC	East African Community
ECM	Error Correction Model
FDI	Foreign Direct Investment
FX	Foreign Exchange
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
IMF	International Monetary Fund
LSDV	Least Squares Dummy Variable
NEX	Net Exports
NTB	Non-Tariff Barrier
SSA	Sub-Saharan Africa
ToT	Terms of Trade
UN-ECA	United Nations Economic Commission for Africa
UNCTAD	United Nations Conference on Trade and Development
VECM	Vector Error Correction Model
WTO	World Trade Organization

ABSTRACT

This study investigates the impact of trade regulations—specifically tariffs, foreign exchange rates, WTO membership, foreign direct investment (FDI), net exports, and terms of trade—on economic growth in eleven East African countries over the period 2000 to 2023. Using panel data and robust econometric techniques, including the Driscoll-Kraay standard error regression, the study accounts for issues of heteroskedasticity, autocorrelation and cross-sectional dependence common in macro-panel data. Descriptive statistics and trend analysis were first employed to explore the economic performance of the region, followed by fixed effects and ultimately Driscoll-Kraay estimations to determine the relationships between trade-related variables and real GDP. The findings reveal that net exports and terms of trade have a strong, positive, and statistically significant relationship with economic growth. In contrast, FDI and tariff rates are negatively associated with real GDP, although both are statistically significant. Surprisingly, WTO membership was also found to have a significant but negative effect on GDP, suggesting that trade liberalization alone may not be sufficient to drive growth in the absence of domestic institutional and structural reforms. The foreign exchange rate had a negative but statistically insignificant effect on growth. Based on these findings, the study recommends that East African countries pursue more strategic trade and investment policies, enhance institutional capacity for engaging in global trade frameworks, and focus on improving export competitiveness and regional trade integration. These measures are essential for translating trade openness into sustained economic development in the region.

Keywords: Economic Growth, East Africa, Trade Regulations, Panel Data, Driscoll-Kraay

UNIT-1

INTRODUCTION

1.1. Background of the Study

It is widely understood that trade constitutes one of the key drivers of economic growth. Nations use trade to widen their market opportunities, access new technologies, expand employment opportunities, and stimulate economic growth. However, trade policies and regulatory mechanisms at the macro level largely determine to what extent trade may contribute to economic growth. Trade frameworks can broadly be classified into tariff and non-tariff measures, trade facilitation mechanisms, and institutional arrangements that regulate international trade business. As noted by Krugman and Obstfeld (2009), trade regulations include different government rules including tariffs, quotas, and regulatory standards—that influence the exchange of goods and services between countries. These rules offer structural mechanisms and predictability to international trade.

When we come back to our continent Africa, trade has long remained an important tool for promoting economic growth and transformation. In the last few decades, various trade liberalization measures were taken by international organizations such as the World Trade Organization (WTO) and regional blocs like AfCFTA to reduce trade barriers and enhance intra-African trade. However, it has not progressed as intended for various reasons. While some countries have demonstrated successful integration into international value chains, many others have continued facing challenges such as trade deficits, low export diversification, and weak institutions dealing with the sector that undermine the benefits of trade liberalization. Wang et al. (2011) and Robertson (2018) argue that regulatory measures—including both tariffs and non-tariff barriers have significant roles in determining trade outcomes, particularly in developing economies. Cottier (2011) also stresses the role of international institutions in establishing regulatory frameworks that promote fairness, openness, and cooperation in the global market.

The UN-ECA classifies Africa into different regions, one of them is Eastern Africa. This region consists of 14 countries namely: Burundi, Comoros, Congo Dem. Rep., Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Seychelles, Somalia, South Sudan, Tanzania and Uganda.

Eastern Africa Region which includes Kenya, Ethiopia, Uganda, Tanzania, and Rwanda, demonstrates a predominantly compelling case. These countries are engaged in regional integration efforts under frameworks of the East African Community (EAC) and the African Continental Free Trade Area (AfCFTA), which are designed to harmonize trade regulations, lower transaction costs, and facilitate exchange of goods and services among them. Even then these countries still face major challenges which include limited capacity of processed outputs, non-tariff barriers, and unpredictable regulatory enforcement (UNCTAD, 2022). As a result, Eastern Africa has failed to fully unlock its business (trade) potential despite its remarkable economic growth.

In this challenging context of Eastern African countries, cross border trade and the nexus between trade regulations and economic growth demands further study and analysis. This research aspires to explore the influence of the various regulatory mechanisms, trade policies, and institutional frameworks on the region's economic growth and performance. In this study, institutions involved in designing, implementing, and monitoring trade policy—including WTO, AfCFTA, EAC, COMESA, UNCTAD, AfDB, and TradeMark Africa are considered. The purpose of the study is to contribute to policy discussions by providing empirical evidence on the effectiveness of trade regulations in supporting and promoting the growth of Eastern African economy.

1.2. Problem Statement

International trade, the exchange of goods, services, and capital across borders, has long been recognized as a key driver of economic growth and development. Over the past few decades, developing countries have increasingly liberalized trade in hopes of enhancing productivity, accelerating industrialization, and integrating into global markets. While some regions have experienced gains from this process, the Eastern African region presents a more mixed picture. Despite implementing various trade liberalization measures, most countries in the region continue to face persistent trade deficits, low export diversification, and vulnerability to global price shocks (Grozdanovska et al., 2017; UN-ECA, 2024).

Multiple empirical studies — including those using panel, cross-sectional, and time-series approaches — have analyzed the effects of trade openness on economic growth across Sub-Saharan Africa (e.g., Dutt, 2023; Fayisa, 2021). However, much of this literature has focused

narrowly on broad indicators of openness, such as trade-to-GDP ratios or average tariff rates, while paying limited attention to trade regulation, including tariff structures, non-tariff barriers, and institutional arrangements such as WTO membership, as distinct and nuanced policy tools. Additionally, while some studies offer country-specific or regional insights, few have provided a comparative panel analysis focused specifically on Eastern Africa that incorporates both trade regulation and institutional factors.

Country-level evidence reveals a range of outcomes. In Kenya, for instance, the effect of trade openness on growth has been a subject of policy debate. While some actors in civil society have questioned the economic benefits of liberalization, Kiganda et al. (2017) found a statistically significant and positive long-run relationship between trade openness and economic growth using annual data from 1980 to 2009. Their study, based on a Vector Error Correction Model, revealed that a 1% increase in trade openness was associated with a 0.98% increase in economic growth, with unidirectional causality running from openness to growth.

Similarly, Eshun and Tweneboah (2022) investigated the long-run impact of trade liberalization on economic growth in the ECOWAS region using the Pooled Mean Group (PMG) Autoregressive Distributed Lag (ARDL) approach with panel data from 2000 to 2021. Their findings revealed that while trade liberalization had a positive effect on long-run growth, its short-run impact was statistically insignificant. This suggests that the benefits of openness materialize over time and are often dependent on complementary factors such as human capital development and capital formation. These findings imply that regional liberalization efforts, like the African Continental Free Trade Agreement (AfCFTA), must be pursued with a long-term perspective and adequate structural support.

In practice, the trade structure in Eastern Africa remains heavily imbalanced. The region continues to rely on unprocessed agricultural exports and imports most of its processed and industrial goods, contributing to chronic trade deficits. Between 2000 and 2021, average annual exports were estimated at USD 3.67 billion, while imports reached USD 5.64 billion, resulting in an average trade deficit of USD 1.98 billion (World Bank, 2023). Moreover, the average regional tariff rate is 13.2%, and the terms of trade index remains below 100, reflecting persistent unfavorable pricing for exports compared to imports (UN-ECA, 2024).

These trade imbalances raise important questions about the effectiveness of trade regulation in promoting sustainable economic growth. This study is motivated by the need to revisit the trade-growth relationship in Eastern Africa from a regulatory perspective. Unlike prior research, this study integrates variables such as WTO membership status, specific tariff structures, terms of trade, net exports, and exchange rates, in relation to real GDP. Using panel data from 2000 to 2021, the study evaluates how differences in trade regulatory frameworks and institutional participation influence economic outcomes across countries in the region.

By focusing on regulatory dimensions rather than broad liberalization indicators, this study contributes to the literature by incorporating trade regulation as a central explanatory factor, providing updated regional insights using recent data, and offering policy-relevant findings to support more effective trade and industrial strategies in Eastern Africa.

1.3. Objectives

The main purpose of this study is to deeply assess how trade regulations affect trade performance and economic growth in Eastern Africa. Specifically, the study addresses the following objectives:

- To analyze the current state of international trade in Eastern African countries.
- To identify the structural economic problems these countries are facing in international trade,
- To assess international trade mechanisms of Eastern African economies and identify both opportunities and challenges that impact economic growth and trade performance.

1.4. Significance of Study

Global trade significantly impacts economic growth, poverty reduction, and global competitiveness in Eastern African countries. This study may help Eastern African countries achieve better macroeconomic performance by making in-depth analysis of opportunities and challenges in their trade performance. The research may provide valuable insights into trade regulatory frameworks and their impact on economic development in Eastern Africa countries. It provides policy recommendations to improve trade facilitation, reduce barriers, and enhance regional integration. In addition, the findings of this research will contribute to the broader literature in similar field of studies.

1.5. Limitations of the Study

While this study offers valuable insights into the relationship between tariffs, foreign exchange rates, WTO membership, and economic growth in Eastern African countries, there are several limitations to acknowledge. First, the dataset used in the analysis had some missing values, particularly one or two years for certain countries, which were handled through interpolation. While this method allows for a more complete panel, it may introduce estimation bias. Another significant limitation is the exclusion of three Eastern African countries, Eritrea, Somalia, and South Sudan, from the final estimation due to the unavailability of sufficient and reliable data. This exclusion might affect the generalizability of the findings to the broader Eastern African region. Despite these limitations, the study presents robust and policy-relevant findings, while recognizing the need for more comprehensive data and improved econometric approaches in future research.

1.6. Organization of the Study

The remaining part of this paper is organized in four units. Unit Two reviews both relevant theoretical and empirical literature related to the study topic. Unit Three deals with research methodology, that includes indicating data sources, explaining variables, and setting econometric models employed for the analysis. Unit Four, presents and interprets the empirical results. Finally, Unit Five presents conclusion and policy recommendations for policy actions.

UNIT-2

LITERATURE REVIEW

2.1. Theoretical Reviews

2.1.1. Classical Theories of International Trade

The classical theory of international trade narrates the economic benefits nations receive from exchange of commodities with other nations. This implies that countries should only produce products in which they have a comparative competitiveness in relation to other countries. The theory indicates that goods are traded based on the labor units that are included in them. The theory is based on the labor theory of value, which posits that the price of a good is mainly the labor used in the production of the good. Thus, commodities of the same price are assumed to have the same labor costs. The earliest of the classical theories of international trade were developed by Adam Smith and David Ricardo. As for the frameworks, international trade allows countries to specialize and use resources more efficiently. Also, globalization brings in new technologies and skills which in turn increase productivity. (Paliwal, 2022). The theory of classical international trade can be divided into several sub-theories:

- **Mercantilism Theory** – This theory was advocated for in the 17th and 18th centuries, and it stated that a country should only focus on the economic aspect of things and increase exports while reducing imports. It focuses on the increase in the nation's wealth, especially in money, and stresses the need for the government to intervene through subsidies and tariffs to manipulate trade (Heckscher, 1935).
- **Absolute Advantage Theory** – Adam Smith rejected the mercantilist ideologies and came up with the idea of absolute advantage and recommended free trade as a way of enhancing international business. He suggested that countries should focus on producing products in which they have an advantage over other countries and exchanging them for other products. Smith stated that if another country can produce a good at a lower price, then it would be wise to purchase it from that country rather than manufacture it locally. He stated that increased productivity would be to the advantage of all the trading nations and that a country's standard of living is the best way to measure its wealth instead of the amount of money in the treasury. He preferred free trade to government control of the market (Smith, 1776).

- Comparative Advantage Theory – This theory was proposed by David Ricardo in his book ‘The Principles of Political Economy and Taxation’ in 1817, which stated that countries should engage in the trade of products in which they have a comparative cost advantage. This theory means that a country should focus on producing goods and services that it can produce efficiently and export them while importing those that it produces inefficiently even if it can produce all goods more efficiently (Ricardo, 1817). According to Ricardo’s model, labor is the only factor of production and there are no trade restrictions. Later economists such as J.S. Mill and Marshall added some improvements to this theory.
- Heckscher-Ohlin Theory – This theory is also referred to as the factor proportions theory and was developed by Heckscher and Ohlin in the early part of the 20th century. It states that a country’s competitive edge is based on the availability of production factors such as land, labor, and capital (Heckscher, 1919; Ohlin, 1933). According to the theory, the cost of production inputs depends on the availability and demand of the inputs. Hence, countries are encouraged to export goods that can be produced using their abundance.

Smith and Ricardo generally advocated for little or no trade barriers and encouraged the advantages of free trade. They suggested that nations should focus on producing goods where they are relatively more efficient and engage in foreign trade to enhance the welfare of all countries involved without the use of measures like tariffs and quotas. This theory also deals with two main issues; what should be imported and exported by a country and how much each country should pay for the goods it imports.

According to classical economists, countries should focus on producing commodities that are in line with their natural factors such as climate and soil, and selling any surplus. The theory focuses on labor cost as the basis of value and recommends that goods should be traded according to the work put into making them. Adam Smith explained this by stating that if one unit of labor can either produce a beaver or two deer, then a beaver would exchange for two deer in the market. In this way, labor costs are the main determinants of market prices and trade relationships.

The classical trade theory remains a foundational element that helps economists and governments as well as industries and society understand international trade. Mercantilism maintained its dominance during the 17th and 18th centuries but its assumptions limited it to systems with only two countries and two commodities. The modern product life cycle theory

surpasses traditional models because it uses advanced assumptions to study production elements that change dynamically. Adam Smith recommended that countries should specialize in producing goods where they achieve the highest manufacturing efficiency. Free trade serves two essential functions according to him because it benefits both national economic success and individual well-being. The classical economists developed a complete framework to analyze international trade complexities although trade disruptions to domestic markets may occur even when economies expand. The authors failed to recognize how specific trade policies could benefit national interests and how trade disturbances affect particular home industries.

2.1.2. Modern or Firm-Based Trade Theories

The emergence of modern firm-level theories started after World War II. The new theories emerged from business school scholars instead of traditional economists who developed classical economic theories. The rise of multinational corporations occurred at the same time these new theories emerged. The development of modern firm-based theories moved away from national-level analysis which classical country-based theories focused on to study firm-level strategic needs and behaviors. (Paliwal, 2022). The following are the modern or firm-based theories propounded by various business school professors:

- Country similarity theory: Steffan Linder, a Swedish economist, was the founder of this theory. The theory marked its emergence in the year 1961 and explained the concept of in-train industry trade. Linder demonstrated that nations with equivalent economic development levels tend to exhibit identical consumer preferences. The theory states that companies first create products for their home market before they start exporting these goods to countries with matching consumer preferences. The export of manufactured goods tends to happen most frequently between nations which have similar per capita income levels according to his theory. Such countries show higher levels of intra-industry trade. The theory holds special significance in situations where consumer decisions heavily depend on brand recognition and product reputation (Linder, 1961).
- Product life cycle theory: This theory was propounded by Raymond Vernon, a business professor at Harvard Business School, in the 1960s. The product life cycle theory which stems from marketing discipline describes three developmental phases of products including new product stage, maturing product stage and standardized product stage. The theory establishes that all initial production of innovative products takes place exclusively

within the nation where it was invented. The theory has successfully explained the fast growth of United States manufacturing leadership during a specific time period. The theory accurately depicts the computer industry's development from its introduction as new products in the 1970s through its maturation during the 1980s and 1990s until it reached its standardized phase when production moved to low-cost Asian countries (Vernon, 1966). The theory succeeds in its analysis yet fails to explain modern global trade patterns because innovation and production now occur across various countries.

- Global strategic rivalry theory: Developed by Paul Krugman and Kelvin Lancaster in the 1980s. This theory centers on the strategies multinational corporations use to achieve a comparative advantage over other similar global competitors. This theory acknowledges the fact that firms will face global competition and prove their superiority. They must surely develop a competitive advantage over each other. The ways through which the firms can gain competitive advantage were termed as barriers to entry for that particular industry (Krugman & Lancaster, 1985). These barriers are basically the obstacles that a firm will face globally when they enter the market. The barriers that companies and firms may try to optimize are:
 - Mainly research and development,
 - The ownership of intellectual property rights,
 - Economies of scale,
 - Unique business processes or methods,
 - Extensive experience in the industry, and
 - The control of resources or favorable access to raw materials
- Porter's national competitive advantage theory: The theory emerged in the 1990s by Micheal Porter with the aim of explaining the concept of national competitive advantage. The theory proposes that a nation's competitiveness majorly depends upon the capability and capacity of the industry to come up with innovations and upgrades. This theory suggests that a nation's ability to achieve sustained competitive advantage in a particular industry is determined by four key attributes: *factor conditions* (local market resources and capabilities), *demand conditions* (local market demand conditions), *related and supporting industries* (local suppliers and complementary industries), and *firm strategy, structure and rivalry* (local firm characteristics) (Porter, 1990). The theory also mentioned the crucial role of government in forming the competitive advantage of the industry

2.1.3. Institutional Economics on Trade

This paper uses institutional economics to analyze how trade regulations function as institutions that create economic results through their ability to minimize transaction costs and enhance trade opportunities but their absence produces negative trade effects.

Institutional Economics studies the way institutions formed by laws and regulations and social norms affect economic behavior and performance. According to this theory institutions establish game rules that determine how markets operate along with the way economic agents (individuals and firms and governments) conduct their interactions.

North (1990) defined institutions as “humanly devised constraints that structure political, economic and social interactions” (Institutions, Institutional Change and Economic Performance). These constraints can be either:

- Formal Institutions: Laws, constitutions, trade policies, property rights, and regulations.
- Informal Institutions: Social norms, customs, business practices, and cultural values.
- The fundamental role of institutions in forming trade policies remains central to this analysis.

The economic system relies on institutions because they establish both legal and regulatory frameworks which control trade activities. According to Douglass North (1990), institutions function as tools that decrease uncertainty through their establishment of economic interaction rules. When institutions remain robust, they provide trade stability through consistent contract enforcement as well as transparent trade policies and predictable tariffs. The absence of robust institutions produces unpredictable policies that prevent both trade and foreign investment from developing.

Open trade regimes exist more commonly in countries that possess well-developed property rights systems combined with effective contract enforcement mechanisms. International business activities become more secure when participants trust that governments will keep their policies stable and enforce contracts according to legal agreements. Efficient trade regulations together with strong legal frameworks in economies lead to better export diversification along with increased trade volumes according to the World Bank (2020).

High transaction costs which stem from poor institutional efficiency create major obstacles for trade activities. Williamson (1985) presented transaction cost economics to show that institutions function as essential elements for reducing market friction. Trade efficiency improves when businesses operate with clear trade regulations alongside minimal corruption since operational costs decrease.

Numerous developing countries face trade delays because their bureaucratic red tape together with excessive tariffs and complex customs procedures generate additional costs. According to Djankov et al. (2010) research, institutions that operate inefficiently lead to longer customs clearance periods and increased trade costs resulting in reduced trade volumes. The World Trade Organization (WTO) confirms this finding through its observation that institutional customs reforms enable a 14% boost in global trade.

Eastern Africa has also different institutions regarding that focus on trade and other sectors of the economy. The following are institutions that operate in Eastern Africa and Africa.

	Institution	Headquarters	Established	Key Role in Trade
1	East African Community (EAC)	Arusha, Tanzania	2000	Promotes regional economic integration through a Customs Union, Common Market, Monetary Union and Political Federation.
2	African Continental Free Trade Area (AfCFTA)	Kigali, Rwanda	2018	Enable the free flow of goods and services across the continent and boost the trading position of Africa in the global market.
3	Common Market for Eastern and Southern Africa (COMESA)	Lusaka, Zambia	1994	Operates a Free Trade Area (FTA), promoting cross-border investment and trade facilitation.
4	African Development Bank (AfDB)	Abidjan, Côte d'Ivoire	1964	Provides funding for infrastructure (roads, ports) and supports trade finance programs.
5	World Trade Organization (WTO) – East Africa Representation	Geneva, Switzerland (Global HQ)	1995	Oversees multilateral trade agreements, resolves disputes, and provides technical support for trade policy.
6	United Nations Economic Commission for Africa (UNECA) – Sub-Regional Office for Eastern Africa	Kigali, Rwanda	1962	Provides policy advice and research on trade integration, supporting EAC and AfCFTA.
7	TradeMark Africa (TMA)	Nairobi, Kenya	2010	Works to reduce trade costs, improve customs efficiency, and enhance market access.

Table 1- Key trade-related institutions in Eastern Africa

There are local ministries in these Eastern African countries that operate on how trades can operate within their countries and that also work on trade policies and regulations.

2.1.4. Gravity Model of Trade

The Gravity Model of Trade is a foundational framework in international economics, widely used to explain patterns of bilateral trade between countries. First introduced empirically by Jan Tinbergen in 1962, the model draws an analogy from Newton's law of gravity, suggesting that the volume of trade between two countries is positively related to their economic sizes and negatively related to the distance between them (Tinbergen, 1962). In this context, larger economies tend to trade more, while greater distance—both physical and institutional—reduces trade due to higher transportation and transaction costs (Anderson, 1979).

The model has since been expanded to include additional explanatory variables such as shared language, colonial history, trade agreements, and institutional similarities, making it one of the most empirically successful tools in international trade analysis (Bergstrand, 1985; Anderson & van Wincoop, 2003). Its adaptability and robustness have allowed it to remain relevant in analyzing both traditional and modern determinants of trade flows.

In the context of Africa, and specifically Eastern Africa, the Gravity Model provides a theoretical basis for understanding why trade between countries in the region remains limited despite geographic proximity. Weak infrastructure, small economic size, and inconsistent regulatory frameworks often counteract the benefits of closeness. The model also emphasizes the significance of trade regulations—including tariffs, non-tariff barriers, and multilateral agreements like WTO membership—in influencing trade patterns and economic performance (Deardorff, 1998).

2.2. Trade Regulation

Trade regulations are rules and laws that govern international and domestic trade, including matters like tariffs, trade barriers, and fair competition. They aim to create a stable and predictable trading environment while also addressing potential problems like unfair practices or deceptive business acts. These regulations are designed to shape the terms under which international trade occurs, including what can be imported or exported, under what conditions, and at what cost. Trade regulations encompass both tariff measures—such as duties and taxes on imported goods—and non-tariff measures, including quotas, licensing requirements, standards, subsidies, and institutional arrangements (Krugman & Obstfeld, 2009; Wang et al., 2011).

The core aim of trade regulations is to manage the trade relations of a country without compromising its national interest. This includes objectives such as domestic industries protection, sensitive goods flow control, government revenue raising, trade balance sustenance, and national security protection. In developing economies such as Eastern Africa, trade regulations stimulate local production, reduce import dependence, and guide industrial policy (Robertson, 2018; UNCTAD, 2022).

In addition, trade regulations are widely acknowledged for playing a decisive role in ensuring fair competition. They contribute to making fair business relations between domestic and foreign producers by setting standards for quality control, safety measures, and environmental compliance. International organizations such as the World Trade Organization (WTO) and regional agreements such as the African Continental Free Trade Area (AfCFTA) set standard rules that help facilitate global trade and reduce protectionist tendencies. The contribution of these regulatory frameworks is great to settle trade disputes and enhance cooperation between countries (Cottier, 2011).

However, the effectiveness of trade regulations depends on their design and enforcement. Poorly implemented or overly restrictive regulations can act as barriers to trade, discouraging investment and reducing economic efficiency. Conversely, well-structured regulations can enhance trade performance, improve competitiveness, and support long-term economic growth—particularly when they are accompanied by strong institutions and sound macroeconomic policies (Koeniger & Silberberger, 2015).

2.2.1. Instruments of Trade Regulation

1. Tariffs

A tariff represents an economic instrument which governments use to tax imported and exported merchandise for trade regulation purposes. The main purposes of tariffs include protecting national industries and creating government income and controlling trade deficit and surplus.

The price of imported goods rises when tariffs are implemented as Krugman & Obstfeld (2018) explain which reduces their competitiveness against domestic products. The protectionist approach raises domestic manufacturing output during short periods but creates trade counterattacks and production inefficiencies throughout extended periods.

2. Non-Tariff Barriers (NTBs)

Non-tariff barriers (NTBs) represent trade restrictions that do not involve direct taxation of imports or exports yet they restrict trade activities. Trade becomes more complex and costly because of these barriers which include regulatory measures and quotas and procedural requirements.

Baldwin & Evenett (2020) state that NTBs function as protectionist tools that maintain domestic industry competitiveness through indirect means.

Common types of NTBs include:

- Import quotas establish specific restrictions on the number of permitted imports.
- Technical barriers to trade (TBTs) – Standards, certifications, and labeling requirements.
- The Sanitary and phytosanitary measures (SPS) category include health and safety regulations that apply to agricultural and food products.
- The implementation of licensing and customs procedures creates bureaucratic delays that slow down imports and exports.

2.3. Empirical Reviews

Empirical findings together with theoretical perspectives continue to spark ongoing discussions among researchers. Studies indicate that strict regulations create barriers to economic development because they block optimal resource distribution between productive industries and efficient firms within those sectors (Bolaky & Freund, 2008). The quality of institutions functions as a fundamental factor that influences how trade affects growth differently between nations (Sindzingre, 2005).

According to the International Monetary Fund (IMF, 1997, p. 84), trade policies rank among the leading economic drivers that promote growth and convergence in developing nations. Throughout history, the expansion of global trade through liberalization efforts and reduced transportation costs has proven to be a major driver of increased output and productivity. The recent momentum has resulted in the poverty reduction of nearly one billion people while enabling numerous developing nations to join the global economy more deeply. The World Bank (2020) provides empirical evidence which demonstrates that trade openness at 1 percentage point of GDP leads to a 0.2 percent increase in per capita income.

Trade openness generates positive effects which become certain only when countries implement supporting policies that stabilize their macroeconomy and attract investments (Newfarmer & Sztajerowska, 2012). Kim and Lin (2009) determined that trade openness creates sustainable economic growth but its effects vary between different levels of national development. According to Herzer (2013) developed nations experience positive effects from trade openness but developing countries may face negative impacts from this openness. Trade liberalization produces varying advantages between nations depending on the level of liberalization they implement. Agénor (2004) and Liang (2006) demonstrate that trade openness leads to growth only when national income exceeds a specific threshold but becomes detrimental to growth when income remains below this threshold.

Nam and Ryu (2024) studied the relationship between trade openness and economic growth throughout the ASEAN region. The researchers describe trade openness through its combination of lowered trade restrictions and expanded trade activity. The research demonstrates that developing nations experience negative GDP effects from lower trade barriers but their GDP grows when trade volumes increase. The analysis demonstrates an intricate process because higher trade

volumes create stronger economic growth in nations with substantial trade limitations which control the outcome of openness.

The research conducted by Gacheru and Gachoki (2024) revealed that trade openness has failed to enhance economic growth in Kenya because the trade openness ratio decreased from 57 percent to 27 percent between 1990 and 2020. The research revealed that enhancing the quality standards of exported products leads to positive economic growth results. The paper recommends that Kenya should develop its export quality and diversity while lowering business expenses to achieve better competitiveness.

Solomon et al. (2024) analyzed secondary data from 1976 to 2023 in a multivariate panel framework to determine that trade liberalization generates substantial economic growth in Cote d'Ivoire, Ghana, and Nigeria. The researchers applied Autoregressive Distributed Lag (ARDL) bound tests and other diagnostic methods to show that trade liberalization creates a lasting connection with economic growth. The study demonstrates that economic growth benefits from macroeconomic elements which include investment together with human capital and foreign direct investment (FDI) inflows and exchange rates thus requiring a comprehensive strategy for optimization.

Denwi et al. (2022) examined the relationship between trade liberalization and economic growth across 42 African countries from 1995 to 2018, using a dynamic growth framework. Recognizing the heterogeneity in income levels and socioeconomic structures that influence trade policy effectiveness, the authors employed the Pooled Mean Group (PMG) estimation technique, which is well-suited for dynamic panels with cross-country differences. The study found evidence of a nonlinear relationship between trade liberalization and economic growth. Specifically, while liberalization initially supports growth, excessive openness beyond certain thresholds results in diminishing or even adverse effects on economic performance. The estimated threshold levels were 139.94% for total trade-to-GDP, 345.32% for export-to-GDP, and 62.80% for import-to-GDP. The findings suggest that African countries can benefit from trade liberalization only when openness remains within optimal bounds, and that complementary conditions—such as institutional capacity, productive diversification, and trade infrastructure—are necessary to moderate the impact of liberalization on growth.

Kutu and Ohonba (2024) investigated the effectiveness of trade liberalization in stimulating economic growth in South Africa over the period from 1986 to 2022. Their study was motivated by the country's persistent macroeconomic challenges, including high unemployment, widespread poverty, and stagnant economic growth, which raised doubts about the efficacy of liberalization policies. Employing the Autoregressive Distributed Lag (ARDL) approach due to the mixed order of integration among variables, their analysis revealed a strong and statistically significant long-run positive relationship between trade liberalization and economic growth. Based on these findings, the authors concluded that deeper economic integration and further liberalization are beneficial for South Africa's long-term growth prospects. They recommended that South Africa—and African economies more broadly—should strategically expand trade openness by minimizing restrictions and fostering greater participation in the global market.

UNESCWA defines trade regulation as a legal field that exists alongside antitrust law under the term “antitrust and trade regulation law.” The regulation of unfair competition methods and deceptive business practices forms part of this legal domain. Trade regulation law contains antitrust law as its primary branch. Trade regulation law encompasses three additional areas which include franchise and distribution law together with consumer protection law and advertising law.

The framework of trade regulations consists of laws policies and rules that control international trade through mechanisms like tariffs, quotas, subsidies, and non-tariff barriers. The regulatory framework exists to control imports and exports while defending national industries and creating fair market competition and promoting economic expansion. Krugman and Obstfeld (2009) explain trade regulations as government-imposed restrictions that affect international border trade movements through tariff quotas and regulatory standards.

Trade regulations play a crucial role in creating regional and international trade agreements. The African Continental Free Trade Area (AfCFTA) and the Eastern African Community (EAC) Trade Protocol work to standardize trade regulations among member states thus reducing trade barriers and enhancing economic integration. Baldwin (2016) demonstrates that regional trade agreements boost economic growth through their impact on transaction costs market access expansion and investment promotion. These agreements face ineffectiveness because regulatory enforcement varies between countries and political instability exists throughout the region.

Trade policies consist of two main categories which include tariffs with both ad-valorem and specific types and non-tariff measures. Tariffs continue to be the primary trade restriction method but their usage has decreased over time. The general movement toward trade liberalization through unilateral actions World Trade Organization agreements and preferential trade arrangements (PTAs) has resulted in substantial reductions in average applied tariffs (Hoekman & Nicita, 2011).

G. V. Vijayasri (2024) recognizes that international trade can be beneficial for countries if properly managed. The market expansion to global levels through international trade enables developing nation entrepreneurs to access new markets and obtain advanced technologies for their businesses. Local entrepreneurs must improve their efficiency because competition from domestic and global markets requires them to maximize resource utilization. Countries that take part in international trade can access new business opportunities through open trade policies. Vijayasri points out that international trade creates positive effects but it does not automatically lead to economic growth and national prosperity. A nation needs adaptable trade policies together with a favorable macroeconomic environment and political stability to maximize trade benefits for sustainable growth.

The research conducted by Ali et al. (2024) demonstrates that economic growth responses to trade liberalization vary between different nations. The analysis shows that lower-middle-income nations experience the most significant growth benefits from trade liberalization because their economic development reaches at least 3% above other developing countries. The success of trade policies depends heavily on a nation's current economic status and its level of development. The authors adjust the Sachs and Warner (1995) trade liberalization index for application with a broad panel of data spanning from 1985 to 2010. The authors support the implementation of tailored policy approaches that match individual countries to their current stage of industrial development.

Baccini and Kim (2012) highlight that international institutions protect open trade systems, prevent protectionist tendencies during emergence of global economic instability. Protectionist policies that safeguard domestic industries by imposing trade restrictions adversely affect the normalcy of the global economy. Transparency and information sharing help reduce uncertainty and build trust between member states. These institutions promote cooperation between member states and enforce liberal trade standards to prevent protectionist measures from happening. The World Trade Organization (WTO), Preferential Trade Agreements (PTAs) and other entities function in tandem to enforce systems that monitor member nations' compliance with international trade agreements.

Nations are bound to respect the established legal obligations thereby supporting enduring liberal trade practices.

Huang (2009) denotes that institutional stability is a critical factor to provide dependable and consistent trade policies for long-term sustainability of economic growth. The emphasis is not on having strong institutions only but also on maintaining their stability because this is necessary for institutional reforms and general economic development. Several factors including interest groups, political uncertainty, rational expectations, and the level of policy commitment are also likely to influence the equilibrium state of institutional stability. These factors also influence the effectiveness of trade policies in implementation. Trade expansion and economic progress are also indirectly influenced by institutional stability because it shapes the investment, trade engagement, and economic transformation environment. A stable institutional framework creates a conducive environment for economic activities, thus supporting growth. Huang also suggests that it is necessary to establish a separate evaluation system of institutional quality, which would be appropriate for China. This framework should consider policy stability and address the problems of path dependence, quality enhancement, and systemic development.

Conteh et al. (2021) examine the relationship between trade openness and economic growth in Sub-Saharan Africa (SSA), and while trade liberalization is often viewed as beneficial, it may have adverse consequences when institutions are weak. The findings obtained from the panel data analysis of 27 SSA countries (1996–2016) using dynamic panel estimation methods demonstrates that trade openness has a significantly negative effect on economic growth of these countries. However, when trade openness and high-quality institutional structures interact, growth outcome provides positive and significant results, which implies that the positive impact of trade openness on growth is dependent on the strength of institutions. Thus, for trade to contribute to the economic growth of SSA countries, they should strengthen their institutions (enhance regulatory governance and reduce corruption). It was recommended that policymakers in the SSA countries as a prerequisite should follow a cautious and step-by-step approach to trade liberalization, and institutional strengthening to achieve a beneficial trade arrangement.

Chhabra et al. (2023) note that in the context of Brazil, Russia, India, China, and South Africa (BRICS) the direct and indirect roles of institutions have not been well assessed and addressed. Their research has filled this gap by estimating long-run and short-run elasticities using system GMM and pooled mean group models. He also fully modified the ordinary least squares method

to capture country-specific effects. Findings of the study reveal that trade and institutional quality only enhance economic growth in the short term. In the long term, however, weak governance undermines the positive effect of trade openness. Thus, it was recommended that trade liberalization and institutional development should be given special attention by policymakers of BRICS countries to maximize benefits to be gained from international trade.

Tondé (2024) investigates the dynamic relationship between institutional quality and trade performance within WAEMU (West African Economic and Monetary Union) countries, focusing on the direction and nature of causality. The study distinguishes between two categories of trade flows—manufactured goods imports and primary product exports—measured in value terms. Employing panel cointegration, panel causality techniques, and the Poisson pseudo-maximum likelihood (PPML) model over the 2002–2021 period, the findings reveal a bidirectional Granger causality between institutional quality and trade. Furthermore, the PPML results demonstrate that institutional quality exerts a positive and significant impact on imports, but a negative and significant effect on exports. This suggests that weak institutional frameworks in the region hinder the effective export of primary products. The study underscores that enhancing institutional quality can generate positive feedback effects on trade, while improved trade performance can in turn support the development of better institutions. Tondé concludes that competitive export-oriented firms should focus on building strong institutions to thrive in global markets, rather than using institutional structures merely as tools for political control.

The reviewed empirical literature offers valuable perspectives on the relationship between trade liberalization and economic growth, employing diverse econometric methods such as ARDL, PMG, VECM, GMM, and PPML across a wide range of countries and regions. These studies collectively highlight important findings, including the long-run benefits of trade openness, threshold effects, and the critical role of institutional quality. However, a common limitation in much of the literature is the over-reliance on broad trade openness indicators—such as trade-to-GDP ratios—without distinguishing the specific impact of trade regulations like tariffs, non-tariff barriers, and institutional arrangements such as WTO membership. Additionally, empirical work focusing specifically on Eastern African countries remains limited, despite the region's unique trade structure, chronic trade deficits, and ongoing liberalization efforts. Many existing studies tend to generalize findings across Sub-Saharan Africa or focus more on West or Southern Africa. In this context, the current study contributes to the literature by explicitly examining trade

regulatory factors—including tariff rates, terms of trade, WTO membership, and net exports—as determinants of economic growth in Eastern Africa. Unlike previous research, this study does not analyze human capital or governance indicators, but instead provides a focused investigation into how trade policies and regulatory frameworks influence economic performance in a region characterized by structural trade imbalances.

2.4. Conceptual Framework

The conceptual framework of this study is informed by the theoretical and empirical literature linking trade regulation and economic growth. While trade is widely acknowledged as a driver of development, the effectiveness of trade policy instruments—such as tariffs, non-tariff barriers, and institutional arrangements like WTO membership—can vary significantly across countries and regions. In Eastern Africa, where trade deficits and structural dependence on imports persist, the relationship between trade regulation and economic performance remains both complex and underexplored.

This study builds on the assumption that trade regulations shape the structure and outcomes of trade, which in turn influence macroeconomic performance. Tariff structures can either encourage or discourage trade depending on their design; WTO membership may enhance market access and regulatory harmonization; terms of trade affect the value of exports relative to imports; and the exchange rate plays a critical role in price competitiveness. Net exports serve as an outcome channel through which these trade-related variables ultimately impact real GDP.

Accordingly, this framework guides the empirical investigation by identifying key explanatory variables—tariff rate, WTO membership, terms of trade, foreign exchange rate, net exports, and FDI—and their expected influence on the dependent variable, real GDP. The figure below illustrates the proposed conceptual framework.

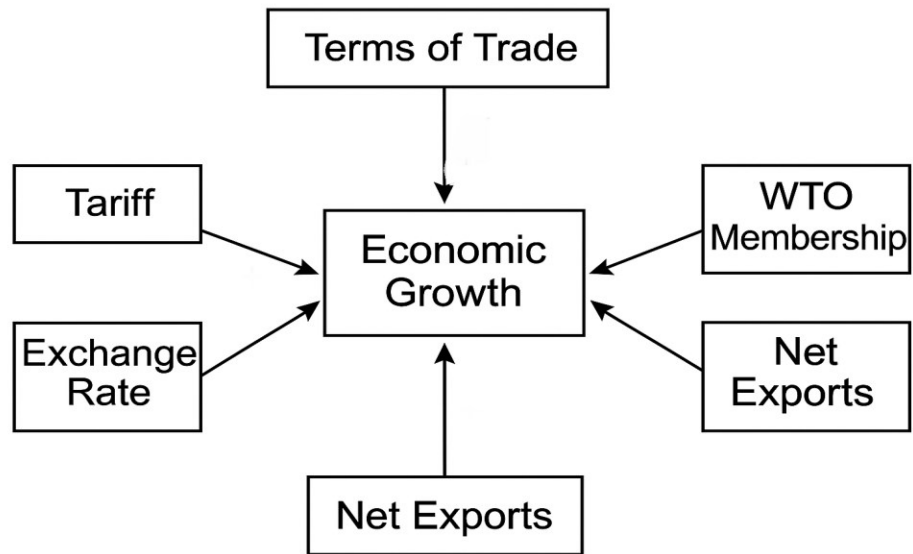


Figure 1- Conceptual Framework of the Study

UNIT-3

METHODOLOGY

3.1. Research Design

This study involves quantitative data analysis, using panel data collected from different sources including the UN Economic Commission for Africa (UN-ECA), World Development Indicators, World Bank (WB) and other international sources for the Eastern African countries. The study uses comparative analysis on these countries using the gathered data from the year 2000 up to 2023.

The Eastern African counties used in this study are Burundi, Comoros, Democratic Republic of Congo, Djibouti, Ethiopia, Kenya, Madagascar, Rwanda, Seychelles, Tanzania and Uganda. (Source: UN-ECA).

3.2. Model Specification

This study adopts a theoretical framework grounded in Endogenous Growth Theory, the Export-Led Growth Hypothesis, and insights from institutional economics to examine the impact of trade-related factors on economic growth in Eastern African countries. Endogenous growth theory (Romer, 1990; Barro & Sala-i-Martin, 2004) emphasizes the role of structural variables—such as foreign investment, policy, and institutions—in fostering long-run economic performance through innovation, capital accumulation, and external linkages.

In line with the Export-Led Growth Hypothesis, trade is considered a driver of output growth, particularly in developing economies, by expanding markets, enabling access to technology, and improving productivity (Balassa, 1985). Moreover, institutional trade frameworks—such as WTO membership—play a vital role in reducing trade costs, enhancing policy predictability, and fostering deeper integration into global markets (North, 1990).

To test the hypotheses of the study multiple regression model was formulated. The dependent variable for the study is Economic Growth (Real GDP). The explanatory variables are Foreign Exchange Rate, Foreign Direct Investment, Terms of Trade, Tariffs, Net Exports and WTO Membership.

Accordingly, the model is specified as:

$$l_RGDP_{ij} = \beta_0 + \beta_1 l_FX_{ij} + \beta_2 l_FDI_{ij} + \beta_3 l_ToT_{ij} + \beta_4 Tariff_{ij} + \beta_5 WTO_{ij} + \beta_6 l_NEX_{ij} + \epsilon_{ij}$$

Dependent variable

I_RGDP_{ij}: ln of Real Gross Domestic Product of country *i* at *j* year

Independent variables

I_FX_{ij} : ln Foreign Exchange Rate of country *i* at *j* year

I_FDI_{ij} : ln Foreign Direct Investment of country *i* at *j* year

I_ToT_{ij} : ln Terms of Trade of country *i* at *j* year

I_NEX: ln Net Exports of country *i* at *j* year

Tariff: Tariff of country *i* at *j* year

WTO: WTO Membership Status of country *i* at *j* year

Where “*j*” is the year from 2000-2023

“*i*” is each Eastern African countries namely: *Burundi, Comoros, Democratic Republic of Congo, Djibouti, Ethiopia, Kenya, Madagascar, Rwanda, Seychelles, Tanzania and Uganda.*

ϵ_{ij} is the error term

3.3. Sources of Data

The data used in this study were collected from reputable international and regional institutions to ensure accuracy and consistency across countries and time periods. The table below presents the primary sources for each variable used in the analysis.

Variable	Description	Source of Data
RGDP	Real Gross Domestic Product	United Nations Economic Commission for Africa (ECA)
FDI	Foreign Direct Investment inflow	United Nations Economic Commission for Africa (ECA)
NETX	Net exports (Exports – Imports)	United Nations Economic Commission for Africa (ECA)
TARIFF	Tariff rate	World Development Indicators (World Bank)
FX	Foreign exchange rate	World Development Indicators (World Bank)
ToT	Terms of trade index	TheGlobalEconomy.com
WTO_Member	WTO membership status	WTO official website and country reports (compiled manually)

Table 2- Data Sources for Each Variable

Definition of Variables

- *Real gross domestic product (GDP)*- is the standard measure of the value added created through the production of goods and services in a country during a certain period.
- *Foreign exchange (Forex or FX)*- is the conversion of one currency into another at a specific rate.
- *Foreign direct investment (FDI)*- is an investment from a party in one country into a business or corporation in another country with the intention of establishing a lasting interest.
- *Terms of Trade (ToT)*- refer to the ratio of a country's export prices to its import prices.
- *Tariffs* - are taxes imposed by one country on goods imported from another country
- *Net Exports (NEX)* - refers to the overall amount of money a country makes through trade after subtracting everything it imports from everything it exports.
- *WTO Membership*- if a country is a member of WTO or not. (1 “Member”, 0 “Otherwise”)

3.4. Estimation Strategy

The model employed for the analysis is the Fixed Effects (FE) regression model with Driscoll-Kraay standard errors, which is more appropriate given the panel structure of the data, the presence of cross-sectional dependence, and heteroskedasticity (Driscoll & Kraay, 1998).

The fixed effects estimation method enables researchers to manage unobserved heterogeneity between countries through the use of time-invariant characteristics that define each cross-sectional unit. The use of time dummies enables researchers to detect global shocks and time-specific effects which affect all countries. The application of Driscoll-Kraay standard errors addressed serial correlation and heteroskedasticity and cross-sectional dependence issues in the data. The methodological adjustment strengthens the reliability of the findings while making sure the estimation technique matches the econometric properties of the data.

3.5. Unit of Measurement of Variables

In this study, various macroeconomic variables are employed to examine the relationship between trade-related factors and economic growth in East African countries. To ensure consistency and comparability across countries and over time, the variables are measured in standard units. Some variables are also transformed into their natural logarithmic forms to linearize relationships and stabilize variance, particularly when variables span wide ranges.

The table below presents the variables included in the regression model, along with their respective units of measurement before any transformation was applied. For transformed variables, the original unit is specified, while the transformation (natural log) is noted separately.

Variable	Description	Original Unit of Measurement	Transformation
RGDP	Real Gross Domestic Product	Constant USD (millions)	Natural logarithm (ln)
FDI	Foreign Direct Investment inflow	Constant USD (millions)	Natural logarithm (ln)
FX	Foreign exchange rate	Local currency per USD	Natural logarithm (ln)
TARIFF	Tariff rate	Percentage (%)	Not transformed
WTO_Member	WTO membership status	Dummy variable (1 = member, 0 = not a member)	Not transformed
NETX	Net exports (exports minus imports)	Constant USD (millions)	Natural logarithm (ln)
ToT	Terms of trade index	Index	Natural logarithm (ln)

Table 3- Variables and Their Units of Measurement

These measurement units are commonly used in empirical economic analysis and align with international data standards. Logarithmic transformation was applied to most variables to normalize the data distribution and interpret coefficients as elasticities, which is particularly useful when modeling growth relationships.

3.6. Expected Signs of Explanatory Variables

In line with standard economic theory and prior empirical studies, each independent variable used in the model is expected to exhibit a particular direction of influence on the dependent variable, real GDP ($\ln_rgdp$). These expected signs are grounded in theoretical frameworks relating to international trade, investment, and macroeconomic performance. Understanding these theoretical expectations helps provide a basis for interpreting the regression results in later chapters.

The table below summarizes the expected signs of the explanatory variables used in this study, based on established economic reasoning:

Variable	Description	Expected Sign	Economic Justification
I_fdi	Foreign Direct Investment inflow	Positive (+)	FDI is expected to enhance economic growth through capital inflow, technology transfer, and job creation.
I_fx	Foreign exchange rate	Ambiguous ($\pm$)	Currency depreciation may boost exports (+), but can increase import costs (-), making the overall effect uncertain.
Tariff	Tariff rate	Ambiguous ($\pm$)	While tariffs may protect domestic industries (+), they can also reduce trade efficiency and competitiveness (-).
WTO_Member	WTO membership status	Positive (+)	Membership in the WTO is expected to promote trade liberalization and integration into global markets, thereby supporting growth.
I_netx	Net exports (exports minus imports)	Positive (+)	A trade surplus directly contributes to GDP, making the expected effect on economic growth positive.
I_tot	Terms of trade	Positive (+)	An improvement in terms of trade raises export earnings relative to imports, thereby increasing national income.

Table 4- Theoretical Expected Signs of Explanatory Variables

These expected signs serve as a benchmark for interpreting the empirical findings in Chapter 4. Any deviations from theoretical expectations will be analyzed in detail in the discussion of results section.

UNIT 4

RESULTS AND DISCUSSIONS

4.1. Descriptive Analysis

This section provides a descriptive analysis of the essential variables which explain trade regulations and economic growth dynamics in Eastern Africa. The analysis uses descriptive statistics and graphical illustrations to present trends and patterns in tariff rates and foreign exchange rates and WTO membership status which provide initial insights about their potential impact on real GDP in Eastern African countries.

The analysis uses descriptive statistics to show variations between countries and time periods which helps understand the underlying data before moving to more complex econometric estimations. The analysis investigates whether changes in trade policy instruments (tariffs and WTO participation) lead to economic performance changes which are measured by RGDP. The method provides both context for the upcoming regression results and shows how specific country trends and correlations affect the trade-growth relationship.

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
l_rgdp	264	22.873	1.544	20.278	25.408
l_fdi	264	18.751	3.043	0.000	22.144
l_fx	264	5.800	1.898	1.157	8.426
l_netx	264	20.387	1.633	13.629	24.438
l_tot	264	4.502	0.229	3.707	4.889
Tariff Rate	264	13.204	5.450	1.750	33.700
WTO Membership	264	0.761	0.427	0.000	1.000

Table 5-Descriptive Statistics for Main Variables (Overall Sample)

The descriptive statistics presented in Table 5 reflect the overall panel mean, calculated from all 264 observations spanning 11 countries over 24 years. This differs from time-series means, which are calculated per country across time.

The descriptive statistics summarize the main characteristics of the variables used in this study. The average value of real GDP (measured in logarithmic form as l_rgdp) across the sample is approximately 22.87, with a minimum of 20.28 and a maximum of 25.41. This shows there is variation in the level of economic output across Eastern African countries. Foreign direct investment (l_fdi) also varies widely, with an average of 18.75 and values ranging from 0 to 22.14. The minimum value of zero suggests that some countries received no FDI during certain years in the study period.

The exchange rate (l_fx) has a mean of 5.80 and a relatively large spread, reflecting differences in currency values among the countries. Similarly, net exports (l_netx) have an average of 20.39, ranging from 13.63 to 24.44, indicating different trade balances across the region. The terms of trade (l_tot) show less variation, with a mean of 4.50 and a small standard deviation, suggesting that the relative prices of exports and imports were fairly stable.

The average tariff rate across Eastern African countries amounts to 13.2 while the values span from 1.75 to 33.7 because these nations implement different trade policies. The WTO_Member variable functions as a dummy variable to show whether a country belongs to the WTO. The mean value of 0.76 indicates that 76% of the sample observations belong to WTO member countries during the study period. The differences between these variables demonstrate why panel data methods are essential for analyzing both country-specific and time-dependent variations.

Trend Analysis

The research examines GDP growth patterns of eleven Eastern African nations from 2000 to 2023 while analyzing how WTO membership and trade-related variables such as tariffs and exchange rates affect economic development. The dataset shows significant differences in growth patterns throughout the region which provides essential information about how trade policy frameworks together with macroeconomic management affect development results.

The most important discovery shows that the economic results between studied countries differ substantially. Ethiopia (ETH) maintained its position as a top-performing economy through 9.2% average annual GDP growth from 2000 to 2015 followed by a decrease to 6.1% during the

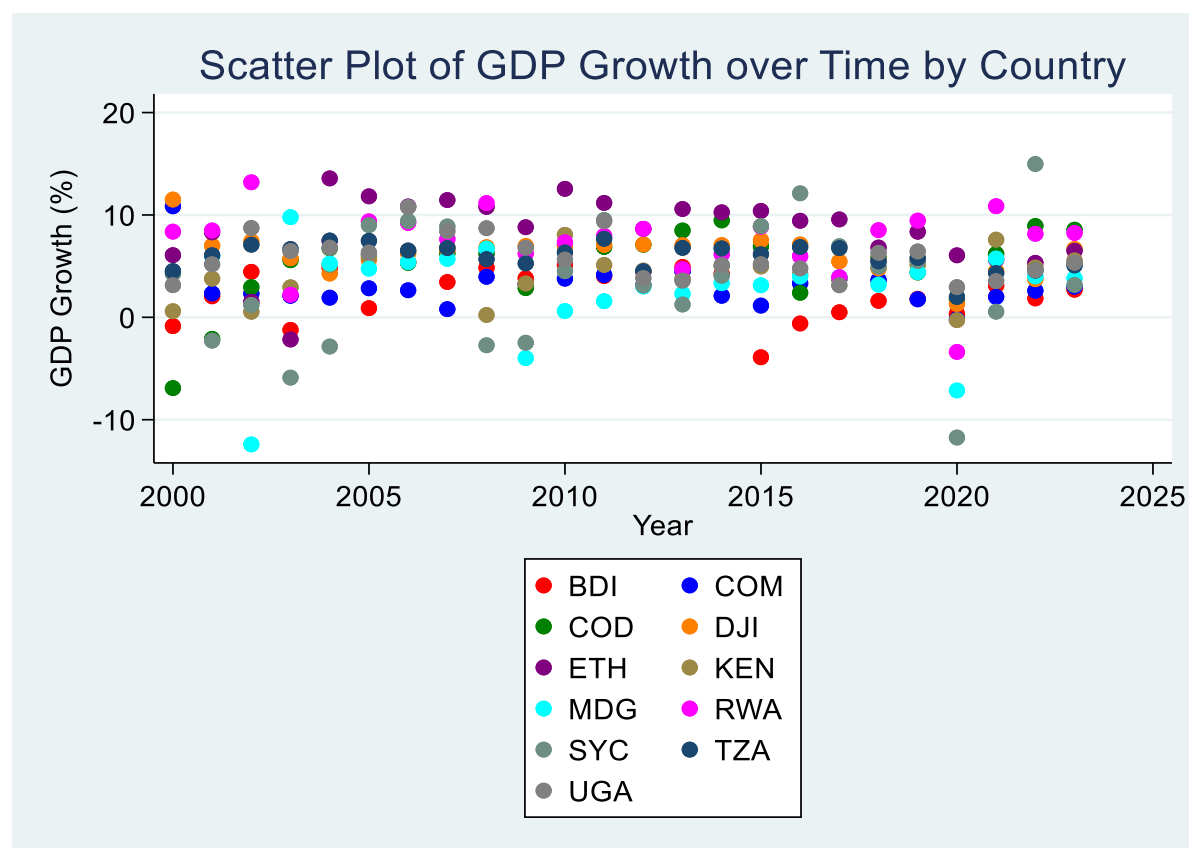
subsequent years. The country experienced strong economic growth at 9.2% annual rate from 2000 to 2015 while remaining outside the World Trade Organization (WTO) until most of the study period. The data indicates that domestic economic policies which support investment and structural transformation have a greater impact on growth patterns than trade integration. The GDP growth rate in Burundi (BDI) fluctuated between -3.9% and 5.4% annually which demonstrates how some regional economies remain exposed to internal and external disturbances.

The research demonstrates that WTO membership produces different economic effects depending on specific circumstances. The two WTO member countries Kenya (KEN) and Tanzania (TZA) maintained steady average growth rates at 5.1% and 6.3% throughout their membership period. The economic performance of Ethiopia as a non-member country remained comparable to that of WTO member countries KEN and TZA which indicates that WTO membership does not guarantee enhanced economic growth. The WTO accession of Seychelles (SYC) in 2015 did not lead to immediate economic growth because the country experienced a 11.7% economic decline in 2020 due to the pandemic before recovering strongly after the crisis. These patterns indicate that the benefits of WTO membership may be contingent upon the broader domestic policy environment and institutional capacity to leverage global integration.

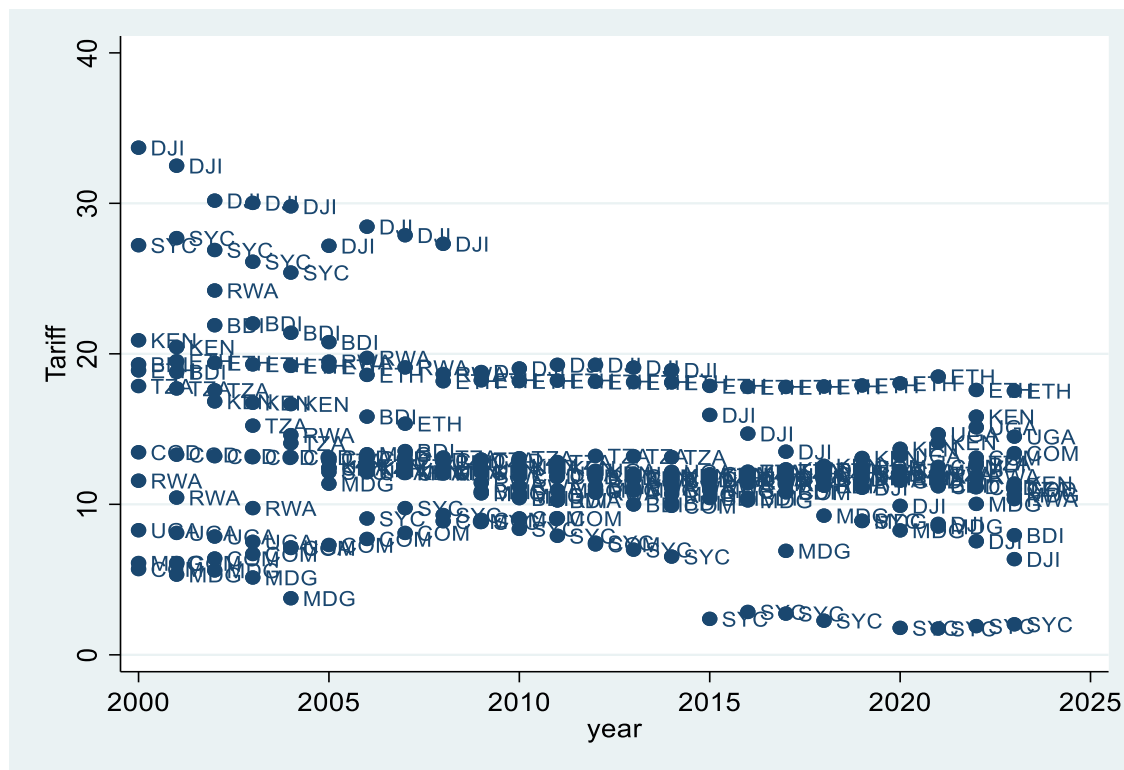
Trade policy, particularly tariff liberalization, shows interesting associations with growth outcomes. Rwanda (RWA), for example, saw a marked reduction in average tariffs from 24.2% in 2002 to 11.4% in 2022, accompanied by steady and strong economic growth. Nevertheless, Ethiopia again presents an outlier, achieving rapid expansion despite maintaining relatively high tariff levels (around 18% on average). This case illustrates that protectionist regimes can, under certain conditions, support industrial development and growth, especially when coupled with coherent national development strategies. Thus, the growth effects of trade liberalization are likely mediated by the presence of complementary policies, such as infrastructure investment, institutional reform, and support for domestic industries.

Exchange rate regimes also appear to play a crucial role in shaping economic performance. Ethiopia experienced significant currency depreciation over the period (from 8.2 ETB/USD in 2000 to 55.8 in 2023), which coincided with a slowdown in growth—potentially due to inflationary pressures and increased import costs associated with rapid devaluation. In contrast, Djibouti (DJI) maintained a fixed exchange rate regime that contributed to macroeconomic stability and supported an average GDP growth rate of 6.7% between 2014 and 2023, largely driven by foreign

investment in port infrastructure. Under its managed floating exchange rate system Seychelles successfully absorbed external shocks and returned to macroeconomic stability after the COVID-19 crisis. These examples demonstrate the crucial role of exchange rate policy as a stabilizing mechanism for economies that depend heavily on trade and external funding. The economic growth patterns of Comoros, Uganda, Madagascar and the Democratic Republic of the Congo (DRC) in Eastern Africa demonstrate the complex relationship between trade integration and exchange rate regimes and economic development. The non-WTO member Comoros had a volatile growth pattern with an average of 3% and a peak of 10.8% in 2000. The WTO member countries Uganda and Madagascar showed different growth patterns. Uganda achieved steady annual growth between 5% and 7% even though it had high average tariffs of 12–14% which indicates that stable macroeconomic management and institutional consistency can compensate for the limitations of more protectionist trade policies. The growth of Madagascar was highly sensitive to political instability even though the country implemented gradual trade liberalization which reduced average tariffs from 13% to 9% during this period.

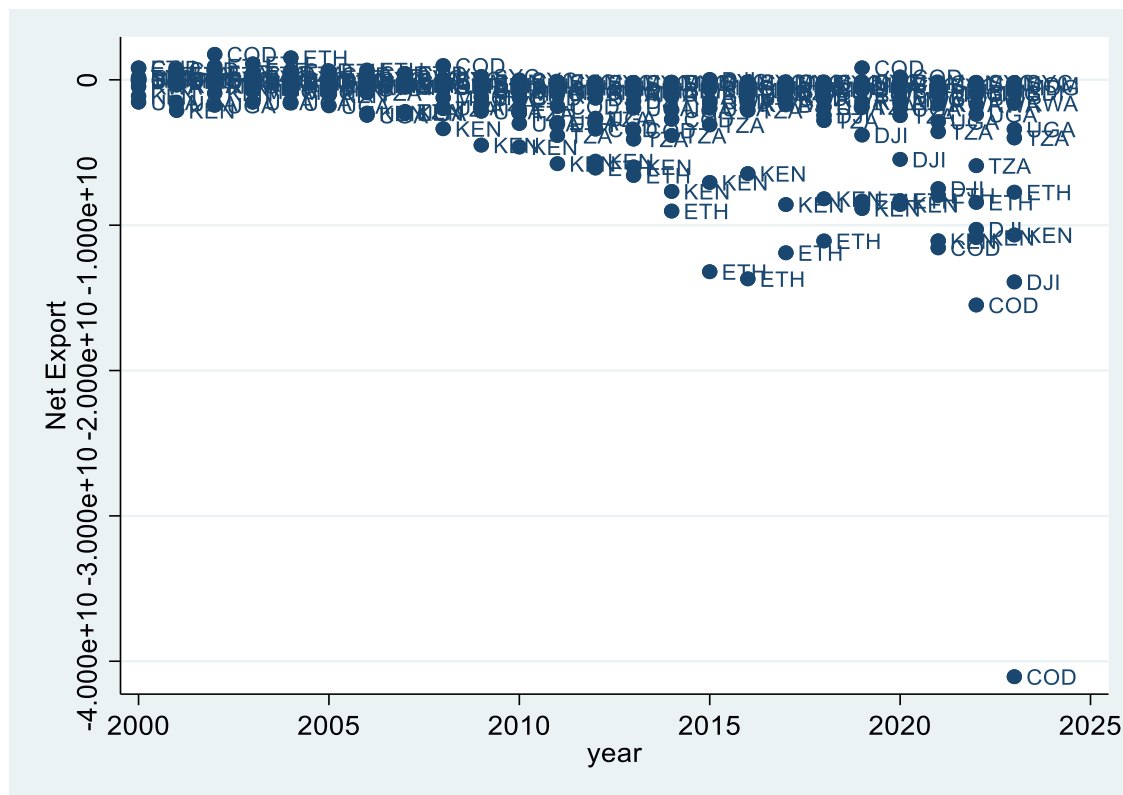


Graph 1- Economic Growth Over Time



Graph 2- Tariff Over Time

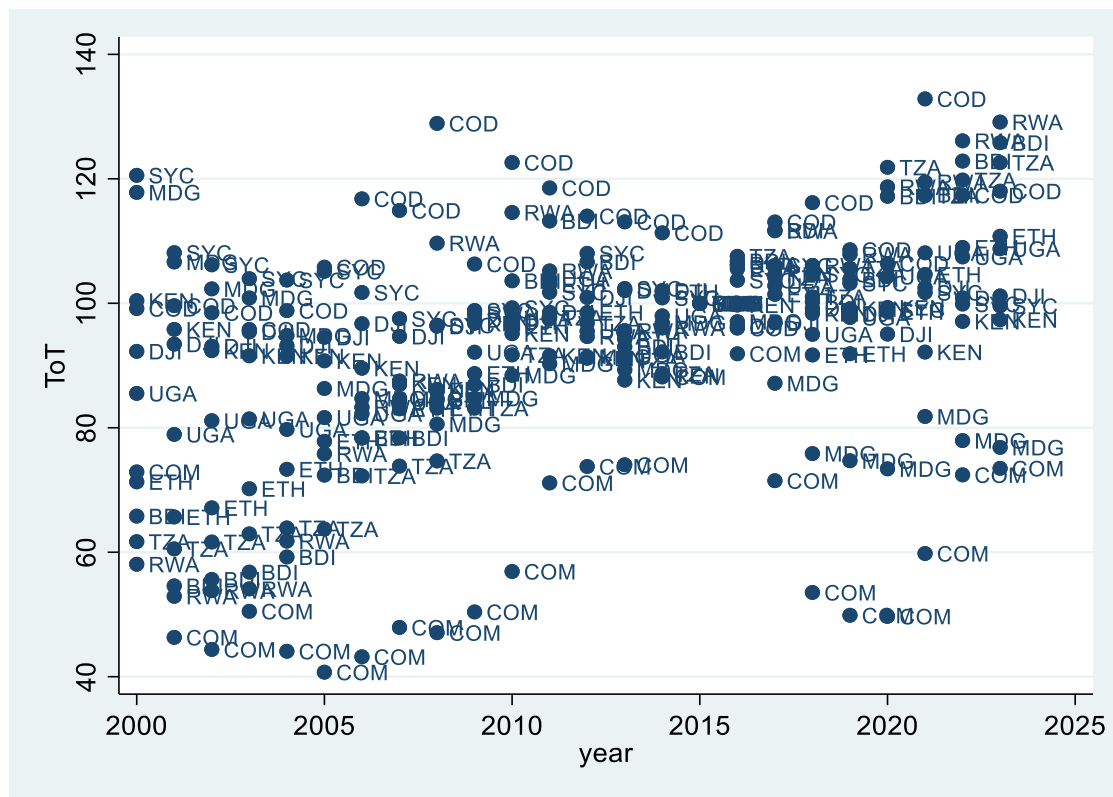
Net exports, calculated as the difference between exports and imports, reflect a country's trade balance. In the dataset, the Net Exports values are consistently negative across most observations, indicating that nearly all countries in the panel run trade deficits. This is consistent with structural characteristics of many Eastern African economies that rely heavily on imports of capital goods and essential commodities, while exports remain concentrated in low-value primary goods. For instance, Burundi and Comoros show persistent negative net exports throughout the time period, underscoring their dependence on foreign goods relative to their export capacity. This pattern aligns with the common macroeconomic challenge in the region — the struggle to shift from consumption/import-driven economies to production/export-oriented growth.



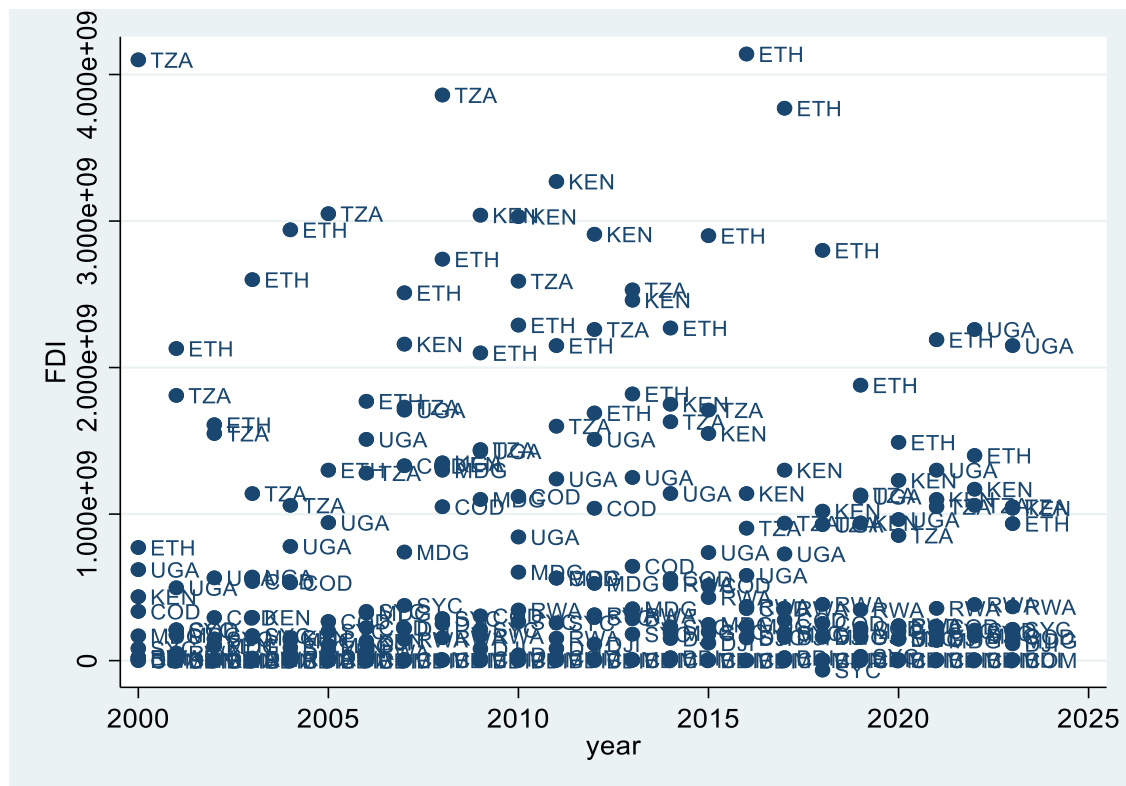
Graph 3- Net Exports Over Time

Terms of trade (the ratio of export prices to import prices) in this dataset range significantly — with values such as 65.80, 99.15, and 71.31 indicating fluctuations in price competitiveness. Countries like Burundi experience notable swings, reflecting their vulnerability to global price shifts, especially in primary commodities. However, overall, ToT values appear relatively stable in the mid-range (around 70–90 for many observations). This suggests that while there is exposure to international price volatility, there’s also a certain resilience or predictability in trade composition.

FDI levels vary significantly both across countries and over time. Some years even show zero or negative values, which may reflect disinvestments or data irregularities. While countries like Ethiopia and Kenya attract comparatively higher volumes of FDI, many others such as Burundi and Madagascar experience minimal inflows, especially in earlier years. The average FDI level is relatively low, pointing to weak investor confidence, inadequate infrastructure, and potential political or institutional instability.



Graph 4- Terms of Trade Over Time



Graph 5- Foreign Direct Investment Over Time

4.2. Econometric Regression Analysis

4.2.1. Fixed Effects Regression Results

The Fixed Effects (FE) regression model represents a common econometric tool in panel data analysis which handles unobserved heterogeneity between cross-sectional units through entity-specific intercepts. The method removes bias from omitted variables that remain constant through time by controlling all time-invariant characteristics of each entity (Wooldridge, 2010). The FE model provides better results than random effects because it handles situations where individual-specific effects show correlations with explanatory variables.

The FE model proves especially useful for this research because it enables the analysis of multiple countries across time to detect the pure effects of time-varying explanatory variables (such as FDI, tariffs, and exchange rates) on real GDP growth while excluding country-specific factors like geography, colonial history, or legal institutions. The FE model delivers unbiased and consistent estimates when there is endogeneity from omitted fixed characteristics (Baltagi, 2008).

The Hausman test was conducted to choose between fixed effects and random effects specifications. The result ($\chi^2(6) = 13.98$, $p < 0.05$) indicates that the fixed effects model is preferred, as the difference in coefficients is statistically significant. Therefore, a fixed effects model for the estimation. The research investigates economic growth relationships with trade policy elements including tariffs and exchange rates and WTO membership in Eastern African nations through regression analysis.

Variable	Coefficient	Std. Error	t-value	P-value
l_fdi	-0.0290	0.0063	-4.62	0.000
l_fx	-0.0314	0.0158	-2.00	0.047
l_netx	+0.0371	0.0098	3.79	0.000
l_tot	+0.3879	0.0621	6.25	0.000
Tariff	-0.0054	0.0023	-2.35	0.020
WTO_Member	-0.0890	0.0628	-1.42	0.158

Table 6- Fixed Effects Regression Results (Dependent Variable: lnRGDP)

The fixed-effects regression results reveal several statistically significant relationships between the explanatory variables and real GDP across East African countries. Foreign direct investment (FDI) and the foreign exchange rate both exhibit a negative and statistically significant effect on economic growth. Specifically, a 1% increase in FDI is associated with a 0.029% decline in real GDP, while a 1% increase in the exchange rate (currency depreciation) leads to a 0.031% reduction in real GDP. On the other hand, net exports and terms of trade demonstrate positive and statistically significant impacts. A 1% rise in net exports increases real GDP by 0.037%, and a 1% improvement in terms of trade contributes to a 0.388% increase in real GDP. Additionally, tariffs are found to negatively influence growth, where a one-unit increase in tariffs is linked to a 0.005% reduction in real GDP.

The model also incorporates year dummies to account for time-specific effects that may influence growth across all countries, such as global economic shocks or regional policy changes. From the year 2004 onwards, nearly all-time dummies are positive and statistically significant, indicating a consistent upward trend in economic performance over time. This suggests that external or regional developments during these years—such as increased investment flows, trade agreements, or improved macroeconomic conditions—may have played a role in enhancing economic growth across the region. (See *Annex* below)

4.3. Diagnostic Tests

Econometric diagnostic tests function as procedures which evaluate the validity and reliability and robustness of econometric models to detect heteroskedasticity and autocorrelation and misspecification issues. The tests determine if the model assumptions are valid and if it correctly represents economic relationships. Multiple diagnostic tests were conducted to validate the accuracy and reliability of the panel regression model used in this research. The tests serve as essential tools to verify if the econometric model maintains its underlying assumptions. The analysis examined three major issues which frequently affect panel data estimations: serial correlation and heteroskedasticity and cross-sectional dependence.

The analysis performed unit root tests to verify variable stationarity and used the Hausman test to select between fixed effects and random effects models. The diagnostic procedures serve two main purposes by validating the model specification and confirming the robustness of the results.

4.3.1. Unit Root Test

Unit root tests are essential in time series and panel data analysis because they help determine whether a variable is stationary (i.e., its mean and variance do not change over time). Stationarity is a key assumption in many econometric models; non-stationary data can lead to spurious regressions and unreliable statistical inferences (Gujarati & Porter, 2009).

In this study, the Pesaran (2007) CADF test, also known as the CIPS test, was employed to assess the presence of unit roots in the panel data. The Pesaran CADF test is suitable for panels with cross-sectional dependence, and it allows for heterogeneity across countries in both the autoregressive coefficients and error variances. The null hypothesis of the test states that all series contain a unit root (non-stationary), while the alternative allows for some series to be stationary.

The results indicated that *l_fdi* and *l_netx* were stationary at level ($I(0)$), while variables such as *l_rgdp*, *l_fx*, *l_tot*, and *Tariff* became stationary only after first differencing ($I(1)$). Interestingly, *WTO_Member* remained non-stationary even after differencing, possibly due to its binary nature or policy-driven constancy over time. These results confirm the mixed order of integration in the dataset, which is common in macroeconomic panel data, and underscore the importance of testing for cointegration before proceeding to regression analysis (Baltagi, 2008; Pesaran, 2007).

Variable	Stationarity Status	t-bar Statistic	P-value
<i>l_rgdp</i>	At First Difference	-2.144	0.000
<i>l_fdi</i>	At Level	-2.394	0.016
<i>l_fx</i>	At First Difference	-1.706	0.005
<i>l_netx</i>	At Level	-3.122	0.000
<i>l_tot</i>	At First Difference	-1.884	0.000
Tariff	At First Difference	-2.053	0.000

Table 7 - Pesaran CADF (CIPS) Unit Root Test Results Summary

4.3.2. Heteroskedasticity Test

The Modified Wald test for groupwise heteroskedasticity was employed to examine the presence of heteroskedasticity in the panel data model. This test is a statistical tool used to detect groupwise heteroskedasticity, which occurs when the variance of the error term is not constant across entities (e.g., countries). It is especially applicable in fixed-effects models, where heteroskedasticity can lead to inefficient estimators and biased standard errors, ultimately affecting the reliability of statistical inferences.

The null hypothesis of the Modified Wald test assumes homoskedasticity — that is, a constant error variance across all panels. In contrast, the alternative hypothesis suggests that the error variances differ across entities, indicating the presence of groupwise heteroskedasticity (Baum, 2001). In this study, the test produced a chi-squared statistic of 817.80 with 11 degrees of freedom, and a p-value of 0.0000, which is well below the 5% significance level. This result provides strong evidence to reject the null hypothesis and conclude that groupwise heteroskedasticity is present across the country panels. The test was implemented using the `xttest3` command in Stata following the fixed-effects regression model.

Test Name	Chi-Square (χ^2)	p-value
Modified Wald Test for Groupwise Heteroskedasticity	817.80	0.0000

Table 8- Result of Modified Wald Test for Groupwise Heteroskedasticity

4.3.3. Autocorrelation Test

The Wooldridge test for autocorrelation was employed to detect the presence of serial correlation in the panel data. The Wooldridge test is a statistical test used to detect autocorrelation in panel data models. It's specifically designed to be robust and reliable, even when there are different patterns of correlation across different individuals or groups in the panel. This test is widely used in panel data analysis due to its simplicity and robustness (Wooldridge, 2002).

The null hypothesis of the Wooldridge test assumes no first-order autocorrelation, while the alternative hypothesis indicates its presence. In this study, the test yielded an F-statistic of 175.99 with 1 and 10 degrees of freedom, and a p-value of 0.0000. This highly significant result leads to the rejection of the null hypothesis, providing strong evidence of first-order autocorrelation in the panel data model. The test was implemented using the xtserial command in Stata after estimating the fixed effects regression.

The existence of serial correlation can lead to biased standard errors, which in turn affects the reliability of inference in fixed effects regressions. Therefore, robust standard errors—such as cluster-robust or Driscoll-Kraay standard errors—should be employed to correct for this issue and ensure valid statistical inference.

Test Type	F-Statistic	Degrees of Freedom	p-value
Wooldridge Test for Autocorrelation	175.99	(1, 10)	0.0000

Table 9- Wooldridge Test for Autocorrelation in Panel Data

4.3.4. Cross-Sectional Dependence Test

Pesaran's (2004) Cross-sectional Dependence (CD) test was employed to test for cross-sectional dependence in the panel dataset. This test examines whether residuals across panel units (countries) are correlated.

The null hypothesis of the Pesaran test states that there is no cross-sectional dependence (i.e., residuals are independent across units), whereas the alternative suggests the presence of cross-sectional correlation. The test statistic yielded a value of -3.248 with a p-value of 0.0012, which is well below the 5% significance threshold. Thus, we reject the null hypothesis and conclude that there is significant cross-sectional dependence among the residuals in the panel model. This finding indicates the presence of interdependencies among the East African countries studied. The test was conducted using the xtcsd, pesaran abs command in Stata. This may arise due to common shocks or unobserved components affecting all countries simultaneously, and it suggests the need for robust standard errors or estimators that account for this dependence (Pesaran, 2004).

Test Type	CD Statistic	p-value	Average Absolute Correlation
<i>Pesaran's Cross-sectional Dependence (CD) Test</i>	-3.248	0.0012	0.435

Table 10- Pesaran's Test for Cross-sectional Dependence

The diagnostic tests showed that the residuals exhibited heteroskedasticity, first-order autocorrelation together with cross-sectional dependence. Standard regression assumptions get violated when these issues exist because they produce inefficient and biased standard errors that reduce the reliability of fixed effects estimates (Hoechle, 2007). Thus, the Driscoll-Kraay regression was used to address this problem.

4.4. Driscoll-Kraay Regression Result

The research employed the Driscoll-Kraay standard error correction to handle econometric problems because it handles both autocorrelation and cross-sectional dependence in panel data models. The macro-panel dataset consisting of 11 countries over 24 time periods makes this method suitable for analysis. Driscoll and Kraay (1998) introduced this method which generates reliable standard errors when disturbances present heteroskedasticity and autocorrelation and panel correlations in macro-panel data as seen in this research.

The transition from fixed effects estimation to Driscoll-Kraay approach produces reliable and robust statistical relationships between trade policy variables and economic growth. The analysis that follows employs the Driscoll-Kraay estimator to generate improved results which provide accurate policy recommendations for Eastern African economies.

The regression model includes RGDP as the dependent variable (logged) together with FDI (logged) and FX (logged) and ToT (logged) and NetX (logged) and Tariff (percent form) and WTO Member (dummy variable) as independent variables. Year dummies served as controls to capture unobserved time-specific factors including global economic impacts and regional policy modifications and commodity price changes. Time fixed effects added substantial explanatory power to the model because R^2 rose from 65% to 91% (see Annex below) which demonstrated that unobserved temporal factors explained most of the economic growth variations between countries and years. The inclusion of these time fixed effects strengthens both the reliability and trustworthiness of trade policy-growth relationships.

Variable	Coefficient	p-value	Interpretation
l_fdi	-0.029	0.004	A 1% increase in FDI inflows (logged) is associated with a 0.029% decrease in RGDP, holding other factors constant. This counterintuitive result suggests that FDI may not have been effectively absorbed in the region, possibly due to weak linkages with the domestic economy or sectoral misalignment.
l_fx	-0.031	0.114	Not statistically significant at 5%. While the coefficient is negative (suggesting depreciation might reduce GDP), it is not robustly supported by the data.
l_netx	+0.037	0.008	A 1% increase in net exports (logged) is associated with a 0.037% increase in RGDP. This indicates that improvements in trade balance positively contribute to economic growth.
l_tot	+0.388	0.000	A 1% improvement in terms of trade is associated with a 0.388% increase in RGDP. This strong and highly significant effect implies that favorable external price movements benefit Eastern African economies.
Tariff	-0.0054	0.002	A 1 percentage point increase in tariff rate leads to a 0.0054% reduction in RGDP. This supports the hypothesis that trade restrictions hinder economic performance.
WTO_Member	-0.089	0.046	Being a WTO member is associated with a 0.089% lower RGDP, controlling for other variables. This surprising result may reflect delayed or uneven benefits of WTO accession in developing countries or structural limitations in policy implementation.

Table 11- Regression Results

The estimated coefficient on the **logarithm of foreign direct investment (l_fdi)** is negative and statistically significant at the 1% level. Specifically, a 1% increase in FDI inflows is associated with a 0.029% decline in real GDP, holding other variables constant. This finding is contrary to the expected positive relationship between FDI and economic growth but aligns with some empirical literature on low-income or developing countries. While counterintuitive, FDI does not always translate into economic growth. This may be due to limited absorptive capacity, poor integration of foreign capital with domestic production systems, or FDI being concentrated in enclaves (e.g., extractive sectors) with few linkages to the broader economy. It suggests that FDI

in Eastern Africa must be complemented by targeted industrial policies and institutional reforms to maximize its developmental impact.

A study conducted by Majumder and Roy (2023) analyzed the impact of FDI on economic growth across 29 developing countries from Asia, Africa, Latin America, and the Caribbean over the period 1991 to 2019, using cross-country data. Their result showed that there is a significant negative relationship between FDI and per capita GDP growth in the later years (2005–2019), despite controlling for factors such as human capital, infrastructure, trade openness, and governance. Using a least-squares dummy variable (LSDV) approach, the study revealed that while FDI positively influenced growth in the earlier period (1991–2004), its impact turned negative in the subsequent phase. This shift suggests that without robust domestic institutional reforms and complementary policies, FDI alone may not contribute positively to growth—and in some cases, may even hinder it. These findings are consistent with my study's results, where FDI exhibited a statistically significant negative association with GDP growth in Eastern African countries.

On the contrary, a study done by Urgaia (2017) examining the relationship between FDI and GDP growth in seven East African countries (1970–2015) found a positive and significant long-run effect of FDI on economic growth. Using panel ARDL and wavelet decomposition methods, the authors identified bi-directional causality between FDI and GDP across short, medium, and longtime horizons. Their findings suggest that a 1% increase in FDI leads to a 0.16% increase in GDP, indicating that FDI contributes positively to long-term economic development in the region.

Net exports (*l_netx*), by contrast, exhibit a positive and statistically significant relationship with real GDP. A 1% improvement in net exports is associated with a 0.037% increase in real GDP, all else equal. This supports classical open-economy growth theory, which posits that trade surpluses contribute to growth through export earnings, economies of scale, and enhanced productivity. The result emphasizes the importance of trade competitiveness and export diversification strategies for sustained growth in the region.

Bakari (2022) investigates the export-growth nexus across 49 African countries from 1960 to 2018 using a wide range of econometric techniques, including Panel FMOLS, DOLS, VECM, ARDL, and GMM. The study confirms a positive and reciprocal relationship between exports and

economic growth which supports the conventional understanding that trade functions as a primary development driver. The research shows that African countries experience a positive relationship between exports and economic growth because net exports play a major role in real GDP development.

Lee and Kim (2019) examine Korea's export-led growth through GDP decomposition techniques in their historical analysis. The study reveals that net exports generated 2.3 percentage points of annual GDP growth throughout 1960 to 2014 which represented 30.3% of total economic expansion. The findings demonstrate that exports serve as a vital factor for maintaining economic development throughout the long term especially for developing nations. The research supports this study's conclusion about Eastern African real GDP growth being positively affected by net exports while demonstrating why export-based strategies boost economic performance throughout the continent.

The terms of trade (I_tot) variable show a highly significant and economically large coefficient of 0.388 which indicates that a 1% improvement in export prices relative to import prices leads to a 0.388% increase in real GDP. This suggests that favorable external price movements (e.g., rising commodity prices) play a critical role in boosting incomes and economic performance in Eastern Africa, especially for countries that are heavily reliant on commodity exports.

A study by Jawaid and Waheed (2011), which examined 94 developed and developing countries using five-year average data from 2004 to 2008, found that improvements in terms of trade have a significant positive effect on economic growth. The results, derived from cross-country OLS estimation, also showed that volatility in terms of trade contributes positively to GDP growth, suggesting that both the level and stability of trade conditions matter. These findings remained robust across various sensitivity tests, including different model specifications and proxies for volatility.

In parallel, Awel and Desalegn (2018) examined the impact of terms of trade and their volatility on economic growth in Sub-Saharan Africa using dynamic panel data models—specifically, the difference and system Generalized Method of Moments (GMM)—to address endogeneity and country-specific effects. Analyzing data from 1985 to 2014, the study found that improvements in both net barter and income terms of trade significantly enhance economic growth, while

deterioration in these indicators hinders it. Given that most of the sampled countries rely on primary commodity exports, they often face declining terms of trade, which negatively affects their economic performance. Additionally, volatility in terms of trade was shown to have a significant adverse effect on growth. These evidence supports the findings of this study, which identified a strong, positive, and statistically significant relationship between terms of trade and real GDP in Eastern African countries.

Tariff rates, entered as a percentage, show a negative and statistically significant effect on GDP. A one-percentage-point increase in the average tariff rate is associated with a 0.0054% decline in real GDP, highlighting the growth-inhibiting effects of protectionist trade policies. This finding aligns with standard trade theory, which holds that high tariffs distort market signals, reduce allocative efficiency, and inhibit the benefits of comparative advantage. Lower tariffs can facilitate access to cheaper intermediate goods, stimulate export-oriented sectors, and foster greater competition, all of which are conducive to growth.

The study done by Furceri et al., (2021), using a panel of annual data that spans 151 countries from 1963 to 2014, finds that increases in tariffs lead to persistent and statistically significant declines in domestic output and productivity, indicating a negative relationship between tariffs and GDP. These effects are more pronounced during economic expansions and in advanced or smaller economies. These findings support the results of this study, which show that tariffs have a significant but negative effect on real GDP in Eastern African countries.

On the contrary, a study by Nwokoye et al., (2023) analyzing the relationship between tariffs and economic growth in Nigeria during the period 2000–2020 found that tariffs exert a positive and statistically significant effect on GDP. Using the Ordinary Least Squares (OLS) regression technique, the research assessed the influence of tariffs along with other macroeconomic variables such as trade openness and exchange rates. The results suggested that tariffs, by acting as protective barriers for local industries against international competition, may stimulate domestic production and contribute to economic growth.

Interestingly, the coefficient on **WTO membership** is negative and statistically significant. On average, WTO membership is associated with a 0.089% lower real GDP, after controlling for other factors. his finding contradicts the theoretical expectation that WTO membership should enhance

economic growth by promoting trade liberalization, improving market access, and encouraging investment. This result does not necessarily imply that trade liberalization is harmful. Rather, it may reflect that the benefits of WTO membership are not automatic and depend on the institutional capacity to implement and enforce rules, as well as the ability to negotiate favorable terms. In developing economies, the expected gains from WTO accession—such as improved market access, investor confidence, and policy credibility—may take time to materialize and are often conditional on complementary reforms.

According to Domínguez Blancas & Ángeles-Castro (2024), trade liberalization—particularly through increased imports—has had a negative effect on GDP per capita growth, especially in lower-income countries. Their panel data analysis covering 102 countries from 1980 to 2022 reveals that the adverse impact of trade has worsened over time, contributing to widening income disparities across nations. This outcome aligns with my study's findings, where WTO membership (a proxy for trade liberalization) showed a negative and statistically significant relationship with real GDP, suggesting that deeper integration into global trade regimes may not uniformly benefit all economies.

The study by Solomon et al. (2024) on trade liberalization and economic growth in selected West African countries (Côte d'Ivoire, Ghana, and Nigeria) reveals a positive and statistically significant long-run relationship between trade liberalization and GDP growth over the period 1976–2023. The research validates that trade liberalization leads to positive economic growth in these countries through an Autoregressive Distributed Lag (ARDL) model when combined with investment and human capital and FDI inflows and exchange rate stability. The present study contradicts this finding because WTO membership acts as a trade liberalization proxy which produces a statistically significant negative effect on real GDP in East African countries. The difference in results may arise from varying levels of trade integration together with institutional preparedness and sectoral competitiveness between West and Eastern African regions.

Overall, the regression results suggest that trade policy and external sector dynamics play a crucial role in shaping economic growth in Eastern Africa. Improvements in net exports and terms of trade are strongly associated with higher growth, while high tariff levels appear to suppress it. The ambiguous or even negative effects of FDI and WTO membership indicate that external integration must be accompanied by robust domestic institutions, strategic planning, and capacity

development. Policymakers should therefore view trade liberalization not as a goal in itself, but as a component of a broader development strategy that includes regulatory reform, investment in human capital, and support for productive sectors.

UNIT 5

CONCLUSION AND POLICY RECOMMENDATION

5.1. Conclusion

This research investigates the impact of trade regulations such as tariffs, foreign exchange rates, WTO membership, net exports, terms of trade, and foreign direct investment on economic growth in Eastern African countries from 2000 to 2023. The study used a balanced panel dataset and robust econometric techniques (including the Driscoll-Kraay estimator), to generate several important and insightful findings because of the complex relationship between trade policy variables and real GDP.

One of the key findings of the study indicates that the relationship between FDI and GDP is statistically significant and negative. This finding suggests that economic growth cannot necessarily be guaranteed by foreign capital inflows alone unless these inflows are complemented by strong supportive domestic policies, high institutional quality, and increased capacity to absorb shocks. The second research finding attests that the foreign exchange rate reveals a negative relationship with GDP and is statistically insignificant. This implies though currency movement is economically important, it may not have provided a strong impact on GDP in this study. The third finding reveals that net exports and terms of trade had strong, positive, and statistically significant impacts on real GDP. This finding reinforces the classical idea that trade competitiveness and favorable external prices both contribute to national income growth.

Moreover, tariff rates exhibited a negative and significant relationship with GDP, highlighting the potential inefficiencies associated with protectionist trade policies. Finally, WTO membership, used as a proxy for trade liberalization, surprisingly showed a negative and statistically significant association with GDP growth. This suggests that the benefits of WTO integration may not be automatic for low-income countries and are likely conditional on domestic policy frameworks, institutional readiness, and structural transformation capacity.

Overall, the results support the notion that trade policy can be a driver of growth, but only when integrated into a broader development strategy. The heterogeneous results across variables also reflect the diversity of economic structures and institutional arrangements in Eastern Africa.

5.2. Policy Recommendations

In light of the empirical findings, the following policy recommendations are proposed to enhance the effectiveness of trade regulations in promoting economic growth in Eastern African countries:

1. Reform FDI Absorption Policies

Since FDI alone was found to have a negative effect on GDP growth, governments should prioritize enhancing the absorptive capacity of their economies. This includes improving infrastructure, aligning FDI with national development priorities, and fostering linkages between foreign and domestic firms to maximize technology spillovers and employment generation.

2. Encourage Export Diversification and Competitiveness

The positive contribution of net exports and terms of trade underscores the importance of enhancing export performance. Governments should invest in value addition, support export-oriented industries, and reduce reliance on raw commodity exports to improve trade balances and buffer against external shocks.

3. Rethink Tariff Strategies

Given the negative association between tariffs and growth, governments should continue to reduce trade barriers gradually, ensuring that domestic industries are simultaneously strengthened through innovation, skills training, and access to finance. Tariff liberalization should be coupled with industrial policy that encourages competitiveness and productivity.

4. Strengthen Institutional Readiness for WTO Engagement

WTO membership was negatively associated with GDP growth, suggesting that deeper integration must be paired with institutional reforms. Governments should strengthen trade-related institutions, improve governance, and ensure compliance with international standards to fully realize the benefits of global trade regimes.

5. Enhance Regional Integration

In the context of the African Continental Free Trade Area (AfCFTA) and other regional blocs, countries should harmonize trade regulations, streamline customs procedures, and invest in cross-border infrastructure to reduce trade costs and foster intra-regional commerce.

By implementing these recommendations, Eastern African countries can enhance the growth-enhancing effects of trade regulation and integration, paving the way for more inclusive and sustainable economic development.

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Annex

Unit root test at level

```
. pescadf l_rgdg, lags(1)
```

Pesaran's CADF test for l_rgdg

Cross-sectional average in first period extracted and extreme t-values truncated

Deterministics chosen: constant

t-bar test, N,T = (11,24) Obs = 242

Augmented by 1 lags (average)

t-bar	cv10	cv5	cv1	Z[t-bar]	P-value
-2.144	-2.140	-2.250	-2.450	-1.278	0.101

```
.
```

```
. pescadf l_fdi, lags(1)
```

Pesaran's CADF test for l_fdi

Cross-sectional average in first period extracted and extreme t-values truncated

Deterministics chosen: constant

t-bar test, N,T = (11,24) Obs = 242

Augmented by 1 lags (average)

t-bar	cv10	cv5	cv1	Z[t-bar]	P-value
-2.394	-2.140	-2.250	-2.450	-2.135	0.016

```
.
```

```
. pescadf l_fx, lags(1)
```

Pesaran's CADF test for l_fx

Cross-sectional average in first period extracted and extreme t-values truncated

Deterministics chosen: constant

t-bar test, N,T = (11,24) Obs = 242

Augmented by 1 lags (average)

t-bar	cv10	cv5	cv1	Z[t-bar]	P-value
-1.706	-2.140	-2.250	-2.450	0.220	0.587

```
.
```

```
. pescadf l_netx, lags(1)
```

Pesaran's CADF test for l_netx

Cross-sectional average in first period extracted and extreme t-values truncated

Deterministics chosen: constant

t-bar test, N,T = (11,24) Obs = 242

Augmented by 1 lags (average)

t-bar	cv10	cv5	cv1	Z[t-bar]	P-value
-3.122	-2.140	-2.250	-2.450	-4.622	0.000

```
.
```

```
. pescadf Tariff, lags(1)
```

Pesaran's CADF test for Tariff

Cross-sectional average in first period extracted and extreme t-values truncated

Deterministics chosen: constant

t-bar test, N,T = (11,24) Obs = 242

Augmented by 1 lags (average)

t-bar	cv10	cv5	cv1	Z[t-bar]	P-value
-2.053	-2.140	-2.250	-2.450	-0.968	0.167

```
. pescadf l_tot, lags(1)
```

Pesaran's CADF test for l_tot

Cross-sectional average in first period extracted and extreme t-values truncated

Deterministics chosen: constant

t-bar test, N,T = (11,24) Obs = 242

Augmented by 1 lags (average)

t-bar	cv10	cv5	cv1	Z[t-bar]	P-value
-1.884	-2.140	-2.250	-2.450	-0.390	0.348

Unit root test at first difference

```
. pescadf d_l_rgdp, lags(1)
```

Pesaran's CADF test for d_l_rgdp

Cross-sectional average in first period extracted and extreme t-values truncated

Deterministics chosen: constant

t-bar test, N,T = (11,23) Obs = 231

Augmented by 1 lags (average)

t-bar	cv10	cv5	cv1	Z[t-bar]	P-value
-3.296	-2.140	-2.250	-2.450	-5.218	0.000

```
.  
. pescadf d_l_fx, lags(1)
```

Pesaran's CADF test for d_l_fx

Cross-sectional average in first period extracted and extreme t-values truncated

Deterministics chosen: constant

t-bar test, N,T = (11,23) Obs = 231

Augmented by 1 lags (average)

t-bar	cv10	cv5	cv1	Z[t-bar]	P-value
-2.517	-2.140	-2.250	-2.450	-2.555	0.005

```
.  
. pescadf d_Tariff, lags(1)
```

Pesaran's CADF test for d_Tariff

Cross-sectional average in first period extracted and extreme t-values truncated

Deterministics chosen: constant

t-bar test, N,T = (11,23) Obs = 231

Augmented by 1 lags (average)

t-bar	cv10	cv5	cv1	Z[t-bar]	P-value
-3.540	-2.140	-2.250	-2.450	-6.053	0.000

```
. pescadf d_l_tot, lags(1)
```

Pesaran's CADF test for d_l_tot

Cross-sectional average in first period extracted and extreme t-values truncated

Deterministics chosen: constant

t-bar test, N,T = (11,23) Obs = 231

Augmented by 1 lags (average)

t-bar	cv10	cv5	cv1	Z[t-bar]	P-value
-3.336	-2.140	-2.250	-2.450	-5.354	0.000

Hausman Test

```
. hausman re fe
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) Std. err.
	(b) re	(B) fe		
l_fdi	-.016078	-.0294328	.0133548	.0059054
l_fx	.1028025	.1067253	-.0039229	.0128534
l_netx	.1548001	.1496861	.005114	.0084802
l_tot	.8714947	.9728065	-.1013118	.05555
Tariff	-.0140444	-.0139493	-.0000952	.0022676
WTO_Member	.1193208	.226246	-.1069252	.0561729

b = Consistent under H0 and Ha; obtained from **xtreg**.

B = Inconsistent under Ha, efficient under H0; obtained from **xtreg**.

Test of H0: Difference in coefficients not systematic

```
chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
          = 13.98
Prob > chi2 = 0.0299
```


Fixed Effects Regression

```
. xtreg l_rgdp l_fdi l_fx l_netx l_tot Tariff WTO_Member, fe
```

Fixed-effects (within) regression Number of obs = 264
Group variable: country_id Number of groups = 11

R-squared: Obs per group:
 Within = 0.6549 min = 24
 Between = 0.0267 avg = 24.0
 Overall = 0.0000 max = 24

corr(u_i, Xb) = -0.3239 F(6,247) = 78.11
Prob > F = 0.0000

l_rgdp	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
l_fdi	-.0294328	.011016	-2.67	0.008	-.05113	-.0077356
l_fx	.1067253	.0270166	3.95	0.000	.0535131	.1599376
l_netx	.1496861	.0152759	9.80	0.000	.1195984	.1797738
l_tot	.9728065	.1009883	9.63	0.000	.7738985	1.171715
Tariff	-.0139493	.0042005	-3.32	0.001	-.0222225	-.005676
WTO_Member	.226246	.1145742	1.97	0.049	.000579	.4519131
_cons	15.38678	.4666897	32.97	0.000	14.46758	16.30598
sigma_u	1.6877642					
sigma_e	.24438847					
rho	.97946351	(fraction of variance due to u_i)				

F test that all u_i=0: F(10, 247) = 342.57 Prob > F = 0.0000

Fixed Effect Regression with time dummies

```
. xtreg l_rgdpl_fdi l_fx l_netxl_tot Tariff WTO_Member i.year, fe
```

Fixed-effects (within) regression Number of obs = 264
Group variable: country_id Number of groups = 11

R-squared: Obs per group:
 Within = 0.9115 min = 24
 Between = 0.3005 avg = 24.0
 Overall = 0.0086 max = 24

corr(u_i, Xb) = -0.1659 F(29,224) = 79.59
 Prob > F = 0.0000

l_rgdpl	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
l_fdi	-.0290147	.0062785	-4.62	0.000	-.0413872	-.0166422
l_fx	-.0314269	.0157513	-2.00	0.047	-.0624666	-.0003873
l_netxl_tot	.0370635	.0097708	3.79	0.000	.0178091	.0563179
Tariff	.3878872	.0620681	6.25	0.000	.2655751	.5101992
WTO_Member	-.0053961	.0022963	-2.35	0.020	-.0099212	-.000871
	-.0890135	.0628317	-1.42	0.158	-.2128304	.0348034
year						
2001	.078275	.0560743	1.40	0.164	-.0322257	.1887757
2002	.0702635	.0567396	1.24	0.217	-.0415482	.1820751
2003	.0847951	.0565263	1.50	0.135	-.0265963	.1961865
2004	.1585578	.0562753	2.82	0.005	.047661	.2694545
2005	.2160379	.056007	3.86	0.000	.10567	.3264058
2006	.2559165	.0564057	4.54	0.000	.1447629	.3670701
2007	.3237731	.0569562	5.68	0.000	.2115345	.4360116
2008	.3758143	.0569666	6.60	0.000	.2635553	.4880733
2009	.383443	.0582204	6.59	0.000	.2687133	.4981727
2010	.4378387	.0586944	7.46	0.000	.3221749	.5535026
2011	.4770104	.0602374	7.92	0.000	.3583059	.5957149
2012	.5370891	.0606332	8.86	0.000	.4176047	.6565736
2013	.6122464	.0605759	10.11	0.000	.492875	.7316179
2014	.6722174	.0602502	11.16	0.000	.5534878	.7909471
2015	.7243871	.0607747	11.92	0.000	.6046238	.8441504
2016	.7429738	.0619034	12.00	0.000	.6209862	.8649614
2017	.828137	.0613754	13.49	0.000	.7071899	.9490841
2018	.8919581	.0616061	14.48	0.000	.7705564	1.01336
2019	.9619526	.0611129	15.74	0.000	.8415229	1.082382
2020	.9316449	.0627283	14.85	0.000	.8080319	1.055258
2021	.9457563	.0649413	14.56	0.000	.8177823	1.07373
2022	.9984283	.0653691	15.27	0.000	.8696113	1.127245
2023	1.026708	.0641882	16.00	0.000	.9002176	1.153197
_cons	20.70591	.3547752	58.36	0.000	20.00678	21.40503
sigma_u	1.6266066					
sigma_e	.12992338					
rho	.99366061	(fraction of variance due to u_i)				

F test that all u_i=0: F(10, 224) = 1177.04 Prob > F = 0.0000

Heteroskedasticity Test

```
. xttest3
```

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: $\sigma(i)^2 = \sigma^2$ for all i

```
chi2 (11) =      817.80
Prob > chi2 =      0.0000
```

Autocorrelation Test

```
. xtserial l_rgdp l_fdi l_fx l_netx l_tot Tariff WTO_Member
```

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

```
F( 1,      10) =    175.989
Prob > F =      0.0000
```

Cross-Sectional Dependence Test

```
. xtcsd, pesaran abs
```

Pesaran's test of cross sectional independence = -3.248, Pr = 0.0012

Average absolute value of the off-diagonal elements = 0.435

Multicollinearity Test

```
. vif
```

Variable	VIF	1/VIF
WTO_Member	2.00	0.500283
l_fx	1.72	0.581236
l_netx	1.45	0.690037
l_tot	1.39	0.719899
l_fdi	1.33	0.754579
Tariff	1.11	0.902334
Mean VIF	1.50	

```
. estat vce, corr
```

Correlation matrix of coefficients of xtreg model

e(V)	l_fdi	l_fx	l_netx	l_tot	Tariff	WTO_Member	_cons
l_fdi	1.0000						
l_fx	0.0698	1.0000					
l_netx	-0.3552	0.0383	1.0000				
l_tot	0.0520	0.3594	-0.1183	1.0000			
Tariff	0.1745	0.1186	-0.2028	-0.1424	1.0000		
WTO_Member	0.2672	-0.5924	-0.3057	-0.4133	0.1117	1.0000	
_cons	-0.1442	-0.4615	-0.3301	-0.8451	0.0776	0.4610	1.0000

Driscoll-Kraay Regression

```
. xtscclrgdp l_fdi l_fx l_netx l_tot Tariff WTO_Member, fe
```

Regression with Driscoll-Kraay standard errors Number of obs = 264
Method: Fixed-effects regression Number of groups = 11
Group variable (i): country_id F(6, 23) = 165.09
maximum lag: 2 Prob > F = 0.0000
 within R-squared = 0.6549

lrgdp	Disc/Kraay					[95% conf. interval]	
	Coefficient	std. err.	t	P> t			
l_fdi	-.0294328	.0097397	-3.02	0.006	-.0495809	-.0092847	
l_fx	.1067253	.0894799	1.19	0.245	-.078378	.2918287	
l_netx	.1496861	.0227053	6.59	0.000	.1027166	.1966556	
l_tot	.9728065	.1438105	6.76	0.000	.6753119	1.270301	
Tariff	-.0139493	.0044927	-3.10	0.005	-.023243	-.0046555	
WTO_Member	.226246	.0939007	2.41	0.024	.0319977	.4204944	
_cons	15.38678	.6890024	22.33	0.000	13.96147	16.81209	

Driscoll-Kraay Regression with time dummies

```
. xtscclrgdp lfdi lfx lnctx ltot Tariff WTO_Member i.year, fe
```

Regression with Driscoll-Kraay standard errors	Number of obs	=	264
Method: Fixed-effects regression	Number of groups	=	11
Group variable (i): country_id	F(29, 23)	=	3265.26
maximum lag: 2	Prob > F	=	0.0000
	within R-squared	=	0.9115

lrgdp	Drisc/Kraay					[95% conf. interval]
	Coefficient	std. err.	t	P> t		
lfdi	-.0290147	.0090882	-3.19	0.004	-.047815	-.0102144
lfx	-.0314269	.0191419	-1.64	0.114	-.0710249	.008171
lnctx	.0370635	.0128697	2.88	0.008	.0104406	.0636865
ltot	.3878872	.0746211	5.20	0.000	.2335216	.5422527
Tariff	-.0053961	.0015167	-3.56	0.002	-.0085336	-.0022586
WTO_Member	-.0890135	.0422786	-2.11	0.046	-.1764735	-.0015535
year						
2000	0 (empty)					
2001	.078275	.0083448	9.38	0.000	.0610125	.0955374
2002	.0702635	.0178523	3.94	0.001	.0333331	.1071938
2003	.0847951	.0195412	4.34	0.000	.0443711	.1252191
2004	.1585578	.0165688	9.57	0.000	.1242826	.1928329
2005	.2160379	.0135278	15.97	0.000	.1880536	.2440223
2006	.2559165	.0174041	14.70	0.000	.2199133	.2919197
2007	.3237731	.015192	21.31	0.000	.2923461	.3552
2008	.3758143	.0129621	28.99	0.000	.3490001	.4026284
2009	.383443	.0229158	16.73	0.000	.336038	.430848
2010	.4378387	.0218796	20.01	0.000	.3925774	.4831001
2011	.4770104	.0272067	17.53	0.000	.4207291	.5332917
2012	.5370891	.0302123	17.78	0.000	.4745902	.599588
2013	.6122464	.030691	19.95	0.000	.5487572	.6757356
2014	.6722174	.0278709	24.12	0.000	.6145622	.7298727
2015	.7243871	.0288806	25.08	0.000	.6646429	.7841313
2016	.7429738	.0366412	20.28	0.000	.6671757	.818772
2017	.828137	.0311565	26.58	0.000	.7636848	.8925891
2018	.8919581	.0372848	23.92	0.000	.8148286	.9690876
2019	.9619526	.0352756	27.27	0.000	.8889794	1.034926
2020	.9316449	.0403095	23.11	0.000	.8482582	1.015032
2021	.9457563	.0449989	21.02	0.000	.852669	1.038844
2022	.9984283	.0455356	21.93	0.000	.9042307	1.092626
2023	1.026708	.0399186	25.72	0.000	.9441297	1.109285
_cons	20.70591	.2630471	78.72	0.000	20.16175	21.25006