EFFECTS OF EXPORT COMPOSITION ON ECONOMIC GROWTH IN KENYA (1990-2023)

BY

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DECLARATION

Declaration by the Candidate

This thesis is my original work and has not been submitted for any academic purposes to any other University. No part of this thesis may be published without the author's and Moi University's permission.

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DEDICATION

This Thesis is dedicated to my amazing parents, Phyllis and Leonard Mkabane, who have continuously given me moral, spiritual, emotional, and material support. They have also been a source of solace and strength anytime I felt like giving up.

Lastly, I thank the All-Powerful God for his direction, life-giving gift, strength, mental acuity, protection, and provision of a healthy life in my dissertation dedication. I offer all of this to you.

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ABSTRACT

Kenya's growth under the Vision 2030 strategy is premised on export diversification through increased competitiveness, value addition, and improved regional access. In line with this vision, his study investigated the influence of Kenya's export composition on economic growth from 1990 to 2023. It focuses on the roles of manufactured, agricultural, and service exports on Kenya's Economic growth. Although existing literature affirms a strong correlation between export growth and Gross Domestic Product, it predominantly emphasizes export volume while overlooking the composition of exports. This study addresses that gap by assessing how different export sectors contribute to Kenya's economic performance. The main objective of the study was to analyze the influence of export composition on Kenya's economic growth. The specific objectives were to determine the influence of manufactured exports on economic growth, establish the effect of agricultural exports on economic growth, and evaluate the contribution of service exports to economic growth. Time series data for manufacturing, services, and agriculture exports for the period 1990-2023 were obtained from the World Bank. The study utilized EViews 14 software for descriptive and inferential statistics. An Autoregressive Distributed Lag (ARDL) model was employed to evaluate both short-run and long-run relationships. Descriptive statistics, unit root tests, and diagnostic tests were also conducted to ensure model validity. The results showed that agricultural exports have a positive and statistically significant short-run impact on GDP growth (coefficient = 0.6889, p = 0.032). Manufactured exports had a marginally significant influence in the long run (coefficient = 0.3485, p = 0.088) while service exports exhibited no statistically significant effect on either time horizon. The findings generally support the Export-Led Growth (ELG) Hypothesis that exports positively influence economic growth. However, the study also reveals that the composition of exports matters for Kenya's economic trajectory. The study concludes that Kenya's economic growth is significantly influenced by the nature of its export mix. The study recommends a multifaceted export strategy encompassing value addition in agriculture, diversifying export products, and investing in trade-enabling infrastructure in the short term and industrial innovation, targeted export incentives, and service sector modernization in the longer term. These insights can guide policymakers in aligning export development strategies with Vision 2030 and Kenya's broader economic transformation agenda.

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ABBREVIATIONS AND ACRONYMS

ADF – Augmented Dickey Fuller

AfCFTA – African Continental Free Trade Area

ARDL – Autoregressive Distributed Lag

ASEAN – Association of Southeast Asian Nations

COMESA – Common Market for Eastern and Southern Africa

EAC – East African Community

ECM – Error Correction Model

ECOWAS – Economic Community of West African States

ELG - Export-Led Growth

FDI – Foreign Direct Investment

GDP – Gross Domestic Product

GMM – Generalized Methods of Moments

NEDPS - National Export Development and Promotion Strategy

OECD – Organization for Economic Co-operation and Development

OLS – Ordinary Least Squares

SADC – Southern African Development Community

TFTA – Tripartite Free Trade Area

UAE – United Arab Emirates

VAR – Vector Auto- Regressive Model

VECM – Vector Error Correction Model

WTO – World Trade Organization

CHAPTER ONE: INTRODUCTION

1.0 Overview

This chapter provides an overview of the study's background, problem statement, objectives, tested hypotheses, significance, and scope of study.

1.1 Background to the Study

The contrasting development paths of China and India have rekindled the debate on the drivers of economic growth. China is often seen as following a more traditional growth strategy, primarily driven by manufacturing (Pravakar et al., 2010). In contrast, India's development has been largely driven by the growth of its service sector. (Bharti, 2012). The services sector was long considered a lagging industry, incapable of driving productivity growth and economic transformation (*Trade and Development Report 2017*, 2017a).

The success story of India has caused professionals to reevaluate their opinions regarding the services sector. It has also forced a reexamination of the conventional wisdom that holds that industrialization is the only way to achieve economic change. The service industry has grown significantly in importance over the last ten years, making about 68% of the worldwide GDP, roughly 75% of GDP in high-income countries, and roughly 57% of GDP in middle- and low-income countries. (E. A. C. Priyankara, 2018).

It is therefore crucial to include services in the discussion of economic transformation, given their expanding significance and their role in GDP, trade, employment, and productivity. For a great deal of low-income and developing African nations, export-led growth (ELG) feels more like an unattainable dream than a reality.

Primary goods exports, which are typically linked to poor productivity and little innovation, have hampered developing nations' ability to rely on free trade and exports as a driver of economic progress. Because of this, factor profits in the primary sector are low, and the industry's weak backward and forward linkages work against an increase in total productivity (Fosu, 1996; Krueger, 1997; Krugman, 1995).

Secondly, primary exports are typically linked to worsening terms of trade and an unfavorable balance of payments between wealthy and developing nations due to their relatively low pricing and intense competition. Thirdly, the income elasticity of primary products is low. As a result, the volume of exports does not rise in tandem with the income development of trading partners. Fourthly, the expansion of exports to developed and developing economies has been hampered by growing nationalistic feelings and increasing calls for more protectionism, despite the noticeable reduction of tariff and non-tariff barriers. Examples include the United Kingdom's decision to leave the European Union, the United States and emerging nations' protectionist trade policies, and the East African Community's (EAC) sluggish pace of economic integration and complexities. As a result, despite raising export volumes, most developing African countries have not achieved the anticipated economic development. (Santos-Paulino & Thirlwall, 2004; Were, 2015). Industrialization policies have also fallen short in utilizing export promotion strategies to grow the manufacturing sector, limiting the growth of manufactured goods' share in exports and national output. (Krueger, 1997; *Trade and Development Report 2017*, 2017b). Supply-side restrictions and domestic trade laws exacerbate the difficulties facing ELG. (*Economic Report on Africa 2017*, 2017) .

(UNCTAD Annual Report, 2022) reports that one of the industries with the fastest global growth rates is the creative economy. Underpinned by concepts, the arts, cultural goods and services, research and development, and entrepreneurship, the creative economy holds the capacity to expand production options, establish a competitive edge, draw in capital, encourage innovation and entrepreneurship, and advance cultural diversity and well-being.

1.1.1 Exports and Economic Growth

The figure in Appendix II illustrates the proportion of GDP that is mainly composed of exports. It peaked at 32% in 1976 and then fell precipitously. According to Kenya's Vision 2030, the country wants to expand at a rate exceeding 10% by the year 2030. (The Republic of Kenya, 2018). To achieve this goal, the Kenyan government formalized the development of its National Trade Policy and, through the Ministry of Industry, Trade, and Cooperatives, started the process that would lead to the creation of its second National Export Development and Promotion Strategy (NEDPS). The NEDPS will constitute a five-year sector development plan with concrete actions on export development issues. It is projected to primarily; stimulate synergies for increased production in particular export sectors to facilitate greater export competitiveness; enhance access to markets as well as sustained performance; recognize and harmonize restrictions in the export sector and recommend mitigation strategies; assign resources centered on high priority objectives and standardize export sector management by defining and allocating responsibilities to respective institutions with better capacities, including implementation, monitoring and evaluation functions (The Republic of Kenya, 2018).

According to the (*Economic Survey*, 2023), Real Gross Domestic Product (GDP) slowed from a revised growth of 7.6 percent in 2021 to 4.8 percent in 2022. While most economic activities saw growth, the Agriculture, Forestry, and Fishing sector contracted by 1.6 percent, which is considered the bedrock of Kenya's Economic Growth. This decline was largely due to reduced agricultural output, attributed to adverse weather conditions during the year. As climate change continues to impact weather patterns, Kenya must explore innovative approaches to drive economic growth. Bolstering and diversifying the agricultural and service sectors through increased exports of goods and services, luring foreign direct investment into these industries, and putting more money into education and training for human capital development are all viable approaches. An example of how services can contribute to economic growth is the tourism sector, which saw improved performance in 2022, driven by a 76.9 percent increase in international visitor arrivals.

1.2 Statement of the Problem

Kenya's real gross domestic product (GDP) growth rose by 4.5% in 2024, down from a high of 5.6% in 2023 (World Bank, 2024). The growth is largely attributed to the growth in the service sector, improved agriculture, and public investment in infrastructure. According to Onyango (2024), a stable macro-economic environment in Kenya has enabled the country to recover from the COVID-19 pandemic and reinvigorated the country back to a growth trajectory (Onyango, 2024). New export markets have emerged and further spurred export-led growth for Kenya. To illustrate, Kenya increased export earnings from 1.2 billion in 1976 to 10.4 billion in 2017, thanks to export processing zones and newly introduced incentives. These markets offer hope for expanded production and, therefore, the creation of productive jobs (IMF Annual Report 2018, 2020).

Despite the continued growth, Kenya still lags in some sectors largely underperforming. For instance, Kenya's export market continues to face structural weaknesses, including low diversification, limited value addition, and high production costs that reduce global competitiveness (Onyango, 2024). Further, while new export markets have emerged, the overall export growth has not kept pace with import growth, inherently resulting in a persistent trade deficit. For example, key export-oriented industries such as manufacturing have recorded stagnation and signal that the external sector is not fully supporting long-term GDP growth (Ouma, Kimani, & Manyasa, 2016).

Therefore, developing a clear understanding of the contribution of exports to Kenya's economic growth is critical. Such understanding can help create a clear picture of Kenya's growth profile and inform policy decisions on trade and industrial development. In this case, it will help discern the specific impact of Kenya's export composition and identify the key sectors the country can target to induce long-term growth.

1.2.1 Exports in Kenya

It is important to break down the components of exports to better define what they entail. They include manufactured exports, agricultural exports, and service exports. The manufactured exports comprise processed raw materials that are exported as finished products. Agricultural exports comprise horticultural produce such as vegetables, fruits, and cut flower products. Service exports are any services provided by a person in one nation to people of companies from another, for example, tourism, software consultancy, and hotels. Through selling services, the country will earn foreign exchange.

As shown in Appendix I, earnings from manufactured exports have risen significantly, increasing from 122 million in 1976 to 1.6 billion in 2017. Agricultural exports have also seen growth, climbing from 72 million in 1970 to 794 million in 2017. Furthermore, service exports have surged from 298 million to 4.6 billion in 2017.

1.3 Objectives

1.3.1 Objectives of the Study

The general objective of the study will be to analyse the effects of export composition on economic growth in Kenya.

1.3.2 Specific Objectives

The study will address the following specific objectives:

i. To determine the effect of manufactured exports on economic growth in Kenya
ii. To establish the effect of agricultural exports on economic growth in Kenya.
iii. To evaluate the effect of service exports on economic growth in Kenya.

1.4 Hypotheses Tested

H_{O1}: There is no significant effect of manufactured exports on economic growth in Kenya

H_{O2}: There is no significant effect of agricultural exports on economic growth in Kenya

H_{O3}: There is no significant effect of service exports on economic growth in Kenya

1.5 Significance of the Study

The results of this study will have an impact on policy, academia, and economic practitioners. On the one hand, uncovering the sectoral contribution of exports to GDP can help policymakers design strategies that help Kenya accelerate growth by targeting areas where the country holds a competitive advantage. Further, for academia, the empirical model used in the study offers a unique perspective on the evaluation of ELG for Kenya. Unlike previous research, this study jointly tests the impact of these three independent variables on Kenya's economic growth, thereby filling a crucial knowledge gap regarding the relationship between export composition and economic development in the country.

This study aligns with (Kenya Vision 2030, 2007)'s Economic Pillar, which aims to increase annual GDP growth rates to an average of 10% through key sectors such as trade, tourism, manufacturing, agriculture, and livestock. Additionally, the study contributes, both directly and indirectly, to several Sustainable Development Goals (SDGs), including SDG 1: No Poverty, SDG 8: Decent Work and Economic Growth, SDG 9: Industry, Innovation, and Infrastructure, SDG 12: Responsible Consumption and Production, and SDG 17: Partnerships for the Goals (*17 Sustainable Development Goals (SDGs)*, n.d.). This is particularly significant as the world faces significant challenges in staying on track to achieve the 2030 Agenda (SDG Progress Report, 2024).

1.6 Scope of the Study

This study focuses on the effect of export composition and economic growth in Kenya. In this case, the study will be limited to the evaluation of the effect of manufactured goods, services, and agricultural exports on Kenya's GDP growth. The

study will consider sectoral scope by evaluating the impacts of total imports before disaggregating sector contributions to garner more insights. To achieve this, the study utilizes the World Bank data set on Kenya's GDP growth rate data, manufactured exports, agricultural exports, and service exports over 34 years (1990-2023). The rationale for limiting the study to this timeframe is to ensure it covers the most recent trends while also meeting the minimum observation requirement for time series analysis.

CHAPTER TWO: LITERATURE REVIEW

2.0 Overview

The researcher presents an overview that includes a review of theories, concepts, empirical literature, a literature summary, emerging issues, a conceptual framework, and the theoretical framework.

2.1 Theoretical Framework

2.1.1 Manufactured Export-Led Growth Hypothesis

As shown by this hypothesis, there appears to exist a long-run equilibrium between manufactured exports and economic expansion. That implied that manufactured exports ought to have a favourable effect on the economy's growth (T. Mosikari et al., 2016). Additionally, they asserted that low growth in manufacturing exports has indeed been identified as a significant factor in many Sub-Saharan African economies' poor economic performance. Boosting exports in the manufacturing sector, especially through the learning process, is a sufficient prerequisite for the expansion and actual advancement of Sub-Saharan Africa's less developed and emerging economies (Amakom, 2012).

2.1.2 Agricultural Exports Led Growth Hypothesis

In both emerging and advanced economies, there has long been a conversation concerning the relationship between exports and economic growth. Certain studies, predominantly in emerging economies, back up the theory of export-led growth (ELG). Considering that the ELG hypothesis has indeed been ascertained in countries, it is worth exploring whether agricultural exports also prompted economic growth. Economists, international organizations, and scientists believe that agricultural export is a growth driver, particularly in emerging economies where it is the primary source

of foreign earnings and national income. They also provide a few justifications in favour of food and agricultural trade. International trade brings the total amount of products and services to the involved nations. It also provides a diverse range of commodities, offering the citizenry more alternatives. To a certain extent, trade tends to keep demand and supply stable, allowing for efficient exchanges and boosting development and economic growth in countries. Agricultural exports, however, can expedite balanced economic growth in all states involved if concerns (trade restrictions and disruptions) associated with global primary agricultural trade are resolved or considerably reduced (Verter & Bečvářová, 2016a).

2.1.3 Service Exports Led Growth Hypothesis

Hypothesis around Growth Driven by exports of services isn't as old as that for total exports or goods exports, hence a small number of empirical studies. Proponents of this hypothesis posited that service exports do have a significant and favourable contribution to economic growth. The services sector has seen tremendous growth, representing roughly half of emerging economies' gross domestic product (GDP), in addition to a boost in global service trade, indicating its importance in developing countries' growth and development. As a result, the expansion of the services sector and its contribution to national growth and development have focused much attention in recent years on the significance of service exports (Loungani et al., 2017).

2.2 Theoretical Literature

2.2.1 Export Base Theory

This research is grounded in the export base theory. It is based on the trade theories of Ricardo and Mill, the location theories of Ohlin, Lijsch, and Isard, and the community development theories of (Browett, 1977). This theory highlights the importance of

external demand in the economic life of a community; an urban cluster is deemed most relevant for the application of such a theory, since production is carried out primarily for exports in a lightly populated area like a city. Despite its initial urban focus, export base theory is no longer confined to the urban economic scene. Its application has been broadened to include regions (subnational areas) much larger than a city or a suburb.

According to (North, 1961), who was the first to develop this theory conclusively, exports or external demand cannot only account for the level of economic activity in cities, but can also be applied to any homogeneous region with a unique set of exportable goods and services shaping the character of its economy. Export base models have also drawn the attention of regional economic experts as a justification for a region's long-run growth. These models imply that a region's growth is reliant on the advancement of its export industries and that external demand growth is the crucial driver of regional growth.

North (1961) asserted that a causal analysis of regional growth could only be framed in terms of the widening of the export base. The export base is critical in determining a region's total and per capita income levels. He emphasizes that the fortunes of regions have been tightly connected to their export base. While the return to factors of production in the export industries indicates the direct significance of these industries to the region's well-being, the indirect effect is more significant.

Nourse (1968) gave an in-depth account of how regional income adjusts to an increase in export demand, as well as the likely sources of the increase in export demand. The product mix of exports and local services is determined in an economy with full employment and optimal resource allocation when the ratio of their prices

equals the marginal rate of transformation between the products. In such a situation, an increase in export demand will only result in the redirection of resources from the production of services to the production of exportable commodities. As a result, an increase in export demand will result in regional income growth only if:

a) There are unemployed or underutilized resources in the region, so the region is at a point below its production possibility curve, and an increase in export demand brings the economy closer to the production possibility curve.
b) Changes in technology or the discovery of new mineral resources can lead to an increase in exports, which in turn can shift the production possibility to curve upward or downward.
c) The increase in the demand for exports, prompted by the increase in the price of the factors involved in the exports sector, caused an inflow of resources from other regions. According to these theories, a country benefits from exporting its products, so a country with a high export rate will have a high economic growth rate.

2.3 Empirical Literature

2.3.1 Manufactured Exports and Economic Growth

Sultanuzzaman et al., (2019) recently examined the impact of exports and technology on economic growth in sixteen emerging Asian countries using a generalized method of moments (GMM) model. The study showed that both technology and exports significantly boost economic growth in both the short and long term. The authors argued that policies focused on advancing trade and technology could foster sustained economic development.

In the case of oil-producing countries, (A. S. Kalaitzi & Chamberlain, 2020) indicated that primary exports negatively impact economic growth. According to an analysis by Kalaitzi and Cleeve, while there was a short-term causal correlation between manufactured exports and economic development, no such relationship existed between primary exports and growth. Similarly, Kalaitzi and Chamberlain found that fuel-mining exports have a harmful long-term effect on economic growth, concluding that there is no causal relationship, either short-term or long-term, between mining fuel exports and economic growth.

According to (A. S. Kalaitzi & Cleeve, 2018) exports of fundamental goods were also essential to economic expansion. Kalaitzi demonstrated the short-run bidirectional causal relationship between primary imports and economic growth using vector autoregressive models and data for the United Arab Emirates from 1980 to 2016. Simultaneously, there was a short-term indirect causal relationship between manufactured exports and economic development through primary imports and exports. On the other hand, these transient effects were not sustained over time.

Bbaale & Mutenyo (2011) examined the economic growth and composition of exports for a sample of 35 Sub-Saharan African countries using the GMM model. The findings revealed that increases in agricultural exports have had a significant impact on economic growth. Manufactured exports played a very small role in explaining economic growth. The study's main weakness is that it only looked at agricultural and manufactured exports.

Kılavuz & Topcu, (2012) used panel data analysis to test the effect of different export and import classifications on economic growth in a sample of 22 developing countries from 1998 to 2008. Only two variables, high-tech manufacturing industry exports and

investments, were found to have a positive and significant effect on economic growth, according to the study.

Torayeh (2011a) assessed the short- and long-term causality between manufactured exports and economic growth in Egypt from 1980 to 2008 using co-integration analysis and the error correction model (ECM). The study's findings revealed that a bidirectional long-run causality existed not only between manufactured goods exports as a whole and economic growth, but also in the case of a few Egyptian export industries. According to the study, there is a long-run circular causality between manufactured exports and Egyptian economic growth.

Njimanted & Aquilas, (2015) used time series data to examine the impact of timber exports on economic growth in Cameroon over 34 years (1980 to 2014). Johansen Co-integration and Error Correction Modeling were used in the study (ECM). The findings revealed that timber exports have a negligible effect on Cameroon's economic growth in the short run, but a significant positive effect in the long run. (T. J. Mosikari et al., 2016) investigated the empirical relationship between manufactured exports and SADC economic growth. To determine the long-run equilibrium between manufactured exports and economic growth, the study used recent panel econometric methods. The study's findings indicated that there is a long-run equilibrium between manufactured exports and economic growth from 1980 to 2012. The findings revealed that manufactured exports have a positive impact on SADC economic growth. Further to that, the study used causality analysis, which revealed that the causality ran from economic growth to manufactured exports.

Using the first two Kaldor laws, (Marconi et al., 2013) evaluated the manufacturing sector's role in the process of development. In addition, the study looked at how

manufactured exports fit into this process because of their importance as a source of independent demand and a way to loosen growth restrictions. The study presented stylized data on the nation's economic performance, focusing on manufacturing and export trends since 1990. It then conducted a theoretical analysis of the role that manufacturing and manufactured product exports play in economic development. The study investigated differences in growth dynamics between two categories from 1990 to 2011, using econometric tests based on dynamic panel data from 63 middle- and high-income countries, omitting significant fuel exporters. The two Kaldor laws were shown to exist, as the analyses demonstrated. This shows that, especially in middle-income nations, raising manufacturing output is essential to raising economic development and productivity. The findings also underscored the critical role of industrial exports in the development process.

In Tanzania, Utonga & Dimoso (2019) conducted research on the Nexus between Export and Economic Growth. The purpose of this study was to investigate the relationship between exports and economic growth in Tanzania. Time series data from 1980 to 2015 were reviewed. While exports are measured in terms of the percentage change in products and services sold overseas, economic growth is expressed in percentage terms. In the end, econometric analysis was used. Testing for the presence of a unit root, co-integration, and causality was all performed. In addition, the Johansen co-integration and Granger causality tests were used to investigate the long-run relationship between variables. The co-integration results demonstrated the existence of a single co-integrating equation. The causality test results revealed a link between economic growth and exports. The findings suggested that, in the long run, there is a link between Tanzanian exports and economic growth.

Kalaitzi (2013) studied the relationship between GDP and exports in the United Arab Emirates (UAE) between 1980 and 2010. To ascertain whether there was a long-term link between the variables, the analysis employed both the Johansen co-integration test and the two-step Engle-Granger co-integration test. Furthermore, the study utilized the Granger causality test and a Vector Auto-Regression (VAR) model to explore causation. The results revealed a long-term correlation between both manufactured and primary exports and economic growth. According to the Granger causality test, there is a one-way relationship between manufactured exports and economic growth. The study also concluded that diversifying the UAE's exports beyond oil could lead to improved economic growth.

According to Bhorat et al., (2016) they approached the question of manufacturing constraints in Africa by examining evidence of structural transformation in Africa and then tailoring it to provide insight into manufacturing performance across African countries using the Atlas of Economic Complexity analytical framework. They also employed this framework to integrate the Atlas of Economic Complexity analytical framework's 'economic complexity' and 'opportunity value' indices into regression estimates that examine the factors limiting manufacturing performance. Using the Atlas of Economic Complexity's analytical and empirical toolkit, it was revealed that productive capabilities in Africa remain relatively low, resulting in low levels of economic development. According to the product space analysis, African economies' export portfolios are peripheral, and hence monopolized by primary products. Based on the opportunity value index, the peripheral nature of Africa's export portfolio has repercussions for the region's capacity to structurally establish itself. It was evident that the productive capabilities exemplified in a typical African economy's productive

structure were far from the productive competencies needed to shift production toward more complex manufacturing activities.

2.3.2 Agricultural Exports and Economic Growth

Izuchukwu (2011) utilized multiple regression analysis to assess the agricultural sector's contribution to Nigerian economic development from 1987 to 2007. Between 1987 and 2007, a positive relationship between GDP and domestic saving, agricultural government spending, and foreign direct investment was discovered. The study also found that domestic savings, government spending, and foreign direct investment could explain 81% of the variation in GDP. Similarly, (Olajide et al., 2012a) employed the ordinary least squares regression technique on Nigerian data spanning the years 1970 to 2010. The results showed that agricultural output and GDP had a positive causal effect.

Ojo et al., (2014) applied the error correction model and co-integration technique to time series data spanning from 1982 to 2012. According to the study, Nigeria's primary agricultural commodities, net capital flow, agricultural output, and global prices all have an impact on long-term economic growth.

Savic et al., (2016) concentrated on the two main pillars of Serbia's agro-industrial complex: agriculture and the food industry. In 2012, secondary data from many sources were included in the study, which used comparison methodologies and correlation analysis. The results showed that newly admitted EU members are better at modifying their agricultural systems to satisfy changing development requirements. This flexibility boosts the agroindustry's added value, which benefits the country's overall economic growth.

Louw et al., (2013) investigated the obstacles impeding the advancement of agro-processing within South Africa's small-scale wheat milling and baking sectors, namely in rural regions. A systematic questionnaire and fifteen interviews with different small-scale wheat milling and baking businesses were used to collect primary data. The results showed that these sectors confront considerable obstacles to entry, such as the requirement for a well-maintained infrastructure, a substantial initial investment, experience in marketing and administration, knowledge of the business, market establishment, and sufficient cash flow. It is crucial to remember that the study used a qualitative methodology as opposed to an empirical one.

Sanjuán-López & Dawson (2010) used panel co-integration methods to examine the contribution of agricultural exports to economic growth in 42 developing countries. The findings suggest that there is a long run relationship, the agricultural export elasticity of GDP is 0.07, whereas the non-agricultural export elasticity of GDP is 0.13, and total exports granger-cause GDP, which supports the export led hypothesis. This study is consistent with (Verter & Bečvářová, 2016b) which used OLS regression, Granger (1969) causality, Impulse Response Function, and Variance Decomposition Approaches to investigate the impact of agricultural exports on economic growth in Nigeria. Both the Granger causality and OLS regression findings support the hypothesis that agricultural exports drive economic growth in Nigeria. The Granger causality technique results also indicate a bidirectional causality running from agricultural export to economic growth in Nigeria.

Faridi (2012) explored and quantified the contribution of agricultural exports to economic growth in Pakistan using the Johansen Co-integration technique for the period 1972 to 2008. The findings of the study showed that agricultural exports have a

negative and significant effect on economic growth, while agricultural exports is 0.58. The findings also showed that there is a bidirectional causality in agricultural exports and real GDP. The study thus suggested that non-agricultural exports should be promoted. This study is in line with (Shah, Haq, & Farooq, 2015) who examined the relationship between GDP and both agricultural and non-agricultural exports to assess the effect of agricultural exports on Pakistan's macroeconomic performance. The Johansen co-integration technique was used in the study, which included secondary data spanning from 1972 to 2008. The main conclusions suggest that, whereas non-agricultural exports have a positive link with economic growth, agricultural exports have a negative correlation with Pakistan's economic growth.

A study by Gilbert (2013) evaluated the influence of agricultural exports on growth in Cameroon using an extended generalized Cobb-Douglas Production function using FAO and World Bank data from 1975 to 2009 (Gilbert et al., 2013).. Long-run equilibrium was evaluated using a co-integration test, and the Engle and Granger process was used to estimate a traditional vector error correction model. The study's conclusions showed that Cameroon's economic growth is somewhat impacted by agricultural exports. It was discovered that cocoa exports had a negative and negligible impact on economic growth, whereas coffee and banana exports demonstrated a positive and significant link with economic growth.

(Ojo et al., 2014) analyzed the relationship between agricultural export and economic growth in Nigeria using time series data covering the period from 1980 to 2012. The research made use of multivariate Johansen co-integration, error correction methods, and Phillips-Perron unit root tests. The empirical results indicated that long-term factors influencing Nigeria's economic growth include agricultural exports,

agricultural output, net capital flow, and the international pricing of the major agricultural commodities produced there. These findings were in line with (Izuchukwu, 2011) which sought to assess the impact of the agricultural sector on the Nigerian economy, utilizing data sourced from the Central Bank of Nigeria's statistical bulletin and the World Bank's Development Indicators. The study employed the use of multiple regression to analyze the data, and the results indicated a positive relationship between Domestic Savings, Government Expenditure on agriculture and FDI on agriculture, and GDP.

(Nazish et al., 2013) sought to determine the effect of agriculture industry, manufacturing industry and service industry on the GDP annual growth of Pakistan. The study employed the use of multivariate co-integration technique (Johansen Juselius), unit root and Augmented Dickey Fuller (ADF) test. The findings of this study suggested that agriculture industry, manufacturing industry and service industry significantly affect the GDP annual growth of Pakistan. The results of the study also indicated that the agricultural sector is more important than other sectors of the economy for Pakistan and that there existed a long run relationship between agriculture, manufacturing, and services and growth.

(Ouma et al., 2016) explored the relationship between agricultural trade and economic growth within the East African Community (EAC). Utilizing various econometric tools, including bivariate Vector Autoregressive (VAR) models, Vector Error Correction Models (VECM), Granger causality tests, and Impulse Response analysis, the research analyzed panel data from 2000 to 2012 covering five EAC member states and 77 additional trading partners. The results revealed a complex landscape: Kenya exhibited a bidirectional relationship between agricultural exports and economic

growth, Rwanda showed a unidirectional relationship, while Burundi, Tanzania, and Uganda demonstrated no significant relationship.

(Ijirshar, 2015) examined the impact of agriculture on Nigeria's economic growth using annual data from 1970 to 2012. Employing econometric techniques such as the Augmented Dickey-Fuller (ADF) unit root test, the Johansen co-integration test, and the Error Correction Method (ECM), the research provided a rigorous empirical analysis of the relationship between agricultural performance and economic growth. The findings revealed that there was a long-run relationship which existed between the variables. The findings also showed that agricultural exports had contributed positively to the Nigerian economy. The study also observed that agricultural exports are an important driver of economic growth and that there is strong empirical evidence of a positive relationship between agricultural exports and economic growth in both the short run and long run. (Alam & Myovella, 2016)

investigated the causal relationship between agricultural exports and GDP in Tanzania. The study utilized time series data for the years 1980 to 2010 to capture the relationship between agricultural exports and economic growth. To accomplish this, the study used the Vector Autoregressive Model, the Unit Root Test, the Co-integration test, the Error Correction Model, and the Causality test. The findings revealed that there is a long-run causal relationship between real GDP and real agricultural exports. The findings also showed that the direction of causality was from agricultural exports to the real GDP.

(Uremadu & Onyele, 2016) aimed to assess the impact of various agricultural exports on Nigeria's economic growth from 1980 to 2014. It analyzed the determinants of total agricultural export supply, as well as the specific export dynamics of cocoa and

rubber, exploring their performance and underlying factors. The data employed the use of descriptive statistics and Ordinary least squares (OLS). The findings revealed that cocoa export supply, while insignificant, had a positive impact on real GDP. In contrast, the export supply of rubber had a negative and insignificant effect. However, aggregate agricultural exports were found to have a positive and significant impact on Nigeria's economic growth.

(Olajide et al., 2012b) analyzed the relationship between agricultural resources and economic growth in Nigeria. The study employed the use of the Ordinary Least Squares Regression method to analyze the data. The findings of the study revealed a positive cause-and-effect relationship between gross domestic product (GDP) and agricultural output in Nigeria. The findings also showed that the Agricultural sector was estimated to contribute 34.4 percent variation in gross domestic product (GDP) between 1970 and 2010 in Nigeria.

Using panel data spanning from 1980 to 2013, (Edeme et al., 2016) assessed the influence of agricultural exports on the economic expansion of 15 ECOWAS nations. The rate of labor force participation, capital stock, exports, both agricultural and non-agricultural inflation, and economic growth were key variables. The fixed-effects model results suggested that the economic growth of these ECOWAS nations was not significantly impacted by agricultural exports. The total impact of agricultural exports from all the countries was also assessed in the study, and while the impact was not as great, it was still considerable. Although agricultural exports had a considerable impact on economic growth, it was suggested that ECOWAS governments should strengthen their agricultural sectors because the impact differs depending on the nation.

(Bamwesigye & Natasa, 2015) evaluated the economic impact of coffee trade liberalization in Uganda as a catalyst for rural development. Using an exploratory design and descriptive research methods, it analyzed time series data on coffee production, exports, and consumption. The findings revealed that trade liberalization, implemented in 1991/1992, led to a significant boom in the coffee sector. This liberalization increased the number of market participants, enhanced competitiveness, and expanded Ugandan coffee's presence globally, with the largest share in the European Union.

(Oyakhilomen & Zibah, 2014) studied the relationship between agricultural production and the growth of the Nigerian economy with a focus on poverty reduction. The study employed time series data, and the analysis was done using unit root tests and the bounds (ARDL) testing approach to co-integration. The findings of the study indicated that agricultural production was significant in influencing the favorable trend of economic growth in Nigeria.

2.3.3 Services Exports and Economic Growth

(Singh, 2012) aimed to determine whether service-led growth in India is sustainable. The study sought to clarify concerns regarding the sustainability of this growth model. According to the research, India's services sector has consistently increased its share of GDP and growth rate since the onset of economic development. The sector's share of GDP rose from 28% in the 1950s to 54% in the 2000s, driven primarily by the high-income elasticity of demand for services, the integration of services as inputs in other sectors, and the rise in service exports from the demand side.

Using an ARDL technique with a newly constructed dataset from the IMF BOP, (Hanson et al., 2019) examined the long-term link between real GDP per capita and

service exports in Mauritius. The analysis covered both total and disaggregated service categories. The findings showed a strong long-term relationship between total service exports and real GDP per person. Only trade and business services, insurance, and pension services were shown to have a significant long-term impact on economic growth among the categories that were investigated. Furthermore, the results demonstrated a bidirectional causal relationship between insurance and pension services and economic growth, as well as a unidirectional relationship between economic growth and aggregate service exports, commerce, and business services.

In a related study, (E. Priyankara, 2018) used a nonlinear ARDL technique to investigate asymmetric cointegration between exported services and economic performance in Sri Lanka. It was discovered that drops in service exports have a larger negative impact on economic growth than gains do. In a similar vein, (Dash & Parida, 2012) investigated the connection between service trade and economic growth in India using VECM, ARDL, and impulse response functions. By using GDP net of service exports as the dependent variable, the study successfully addressed possible correlation concerns and showed growth driven by service exports.

(Liew et al., 2012) employed a VAR model with annual data from 1980 to 2009 to investigate the long-term relationship between trade and economic expansion in Tanzania. The study distinguished between service and merchandise exports. The results demonstrated a long-term association between service exports and economic growth, with economic growth driving service exports. However, no significant correlation was found between merchandise exports and economic growth. In a related study, (Sandri et al., 2016) used the completely modified OLS approach to address endogeneity and serial correlation difficulties as they examined the effects of

goods and services trade on economic growth in Jordan. Trade in services was found to be positively correlated with economic performance, whereas trade in goods was found to have a negative correlation with growth. A sustained trade deficit and a high percentage of imported consumption products relative to overall imports were blamed for this detrimental effect.

To investigate the relationship between service trade and economic development, (Philip & Adeyemi, 2013a) used ordinary pooled, fixed effects, and random effects models to evaluate panel data from thirty-three Sub-Saharan African nations. The results showed that capital, labor, imports, and service exports all had a favorable impact on Sub-Saharan Africa's economic growth.

(Mohamed et al., 2012) studied export trade and economic growth in Tanzania using annual data from 1980 to 2009. The study employed the use of the Vector Autoregressive (VAR) technique and the Granger Causality test. The study disaggregated the export trade into services and goods exports. The analysis could not uncover any proof that goods exports and economic growth are correlated over the long run. Nonetheless, the empirical findings showed a strong long-term relationship between Tanzania's economic expansion and service exports. Tanzania's economy grows because of service exports, a unidirectional connection that was further supported by the Granger causality test.

(Eichengreen & Gupta, 2013) aimed to survey India’s experience with exporting services. The study sought to show that the country’s experience is unique in that modern tradable services are a significantly larger share of GDP than in other countries at comparable levels of economic development. A number of other characteristics, such as overall economic development, communications

infrastructure, access to foreign technology, and spillovers between merchandise and service exports, are also highlighted by panel and country-specific regressions across a cross-section of countries. Even with their influence, these factors don't lessen a dummy variable's importance for India. India is undoubtedly a notable exception when it comes to service exports.

The study by (Spatafora et al., 2012) examined how increasing expertise in service exports contributes to economic growth by analyzing data from 103 nations between 1990 and 2007. They created an index called PRODY, which represents the revenue or productivity level connected to each kind of good and is akin to one that was previously used for exports of goods. Using service PRODYs as stand-ins for the predicted revenue or productivity levels connected to various service categories, this method was applied to the International Monetary Fund Balance of Payments. By summing up the GDP of nations exporting a particular service and adjusting for the sophistication of that service export (service EXPY), the study determined the weighted income worth of a nation's service exports. This was calculated by adding up all of the PRODYs and adjusting for the share of each service in the nation's overall service exports. The results demonstrated a strong correlation between growth performance and the 'quality' of service exports. Even after accounting for variables including per capita income, skills, the size of the domestic service industry, the sophistication of the goods, financial development, institutional quality, and time-invariant country-specific characteristics, this link is still substantial.

Dedicated service-based trade charters have also been introduced by other African regional economic communities. For example, there are clear commitments to improve regional services trade integration made by the Common Market for Eastern

and Southern Africa (COMESA), the East African Community (EAC), and their integration with the Southern African Development Community (SADC) through the Tripartite Free Trade Area (TFTA). A protocol designed especially for services trade is part of the proposals for the African Continental Free Trade Area (AfCFTA), which is also gathering considerable traction. This protocol will include clear pledges to liberalize services, such as lowering tariffs in specific service subsectors and removing non-tariff obstacles like mutual standard recognition, streamlined certification procedures, and licensing procedures. With 1.2 billion inhabitants and a combined GDP of $3.4 trillion, the African Continental Free Trade Area (AfCFTA) has the potential to overtake all other free trade areas in the world if it is fully implemented throughout all 55 African Union member states. (Parshotam, 2018).

(Visagie & Turok, 2019) examined international services trade in the SADC area from 1995 to 2012 using a thorough services trade database made available by the OECD and WTO. It turned out that during the 1990s, services exports grew quite slowly. A thorough investigation revealed that, despite a discernible uptick beginning in the mid-2000s, services exports frequently lagged domestic growth rather than spearheading economic booms. While modern industries like IT, banking, and business services had relatively greater growth rates, older sectors like travel and transportation accounted for a large portion of the composition of services exports.

Based on official statistics, the services sector continued to be the backbone of the economy in nearly all of the ECOWAS countries between the years 2000 and 2009, accounting for an average of 42% of GDP. Agriculture comes in second at 36% and industry at 23%. After adjusting for per capita income, the share of this industry is higher than that of other emerging regions. For example, despite Latin America's

approximately eightfold higher per capita income, West Africa's average proportion of services is only somewhat lower than that of that region. The emergence of the informal economy has been the main tendency, even if the services sector has expanded due to recent growth in finance, telecommunications, and tourism. (Nwokoye & Emmanuel, 2018).

(E. Priyankara, 2018) used time series data collected every year from 1984 to 2013 to explore whether Sri Lanka's service exports influenced the country's economic growth. The findings suggested that there is a unidirectional causal connection between service exports and economic growth, and this relationship holds true regardless of the lag structures and integration orders.

In a comparable investigation, (Mattoo, 2006) used cross-country regressions to examine how trade liberalization in the finance and telecommunications industries affected economic growth for 60 countries between 1990 and 1999. The results provide compelling and convincing evidence that trade openness in services had a favorable long-term growth impact. According to the report, nations that have completely liberalized their banking and telecommunications sectors have grown at rates that are up to 1.5% quicker than those that have not.

(Sermcheep, 2019) Based on the panel data from 1980 to 2014, in his study, which aimed to examine the effect of services export on economic growth in the ASEAN countries. With an emphasis on whether traditional and contemporary service exports contribute to growth differently, the study examined the effect of service exports on economic development in ASEAN nations. The econometric analysis, which used a panel dataset that included ASEAN nations from 1980 to 2014, showed that service exports had a favorable impact on GDP growth throughout the region. This result

emphasizes how important service exports have been to ASEAN's economic expansion in recent decades.

Employing panel data from 33 Sub-Saharan African nations encompassing periods from 1990–2010, (Philip & Adeyemi, 2013b) explored the influence of the trade in services on economic development. Within an endogenous growth framework, the analysis used conventional pooled, fixed effects, and random effects models to disaggregate trade data into categories of travel, transportation, and other services. The findings revealed that the region's economic growth was greatly influenced by both service imports and exports.

2.4 Summary of Literature and Emerging Issues

Despite extensive research on export-led growth, several gaps remain that justify a Kenya-specific study. Currently, much of the existing literature focuses on other developing countries or uses cross-country panels for Sub-Saharan Africa and emerging economies. Consequently, there is limited empirical evidence on how export composition specifically affects Kenya’s economic growth. Further, most studies aggregate exports or categorize them simply into primary versus non-primary exports. While this is effective for evaluating ELG generally, the model masks details that would emerge from finer disaggregation into key sectors such as agriculture, manufacturing, and services. This simplification overlooks the structural transformation occurring in many developing economies. By considering sector-specific contributions, this study will avoid potentially misrepresent the differential effects of diverse export types may have on economic growth.

The causality between exports and growth is also ambiguous in prior studies. At a glance, extant literature reveals divergent opinions about how export composition

influences economic growth. This may be due to the application of different econometric methodologies in prior research. In this case, utilizing sophisticated econometric methods, such as Granger causality tests, this study fills these gaps by investigating the relationship between export composition and economic growth. Exports of manufactured goods, agricultural products, and services were added to the empirical model as well. A detailed overview of the emerging gaps in extant literature is attached as Appendix II.

2.5 Conceptual Framework

Kenya's GDP growth rate depends on several factors, including Export Composition. Increasing Manufacturing exports will contribute to the increase in GDP since technology will be readily available and there will be more jobs created locally, thus increasing capital, which translates into growth of GDP. Agricultural Exports would be an asset to an economy because the domestic sector has observed that agricultural exports are an important driver of economic growth. Service Exports also influence the economic growth of a country if they are made available at a high quality.

In the following figure 1.1, the interaction between the variables is displayed.

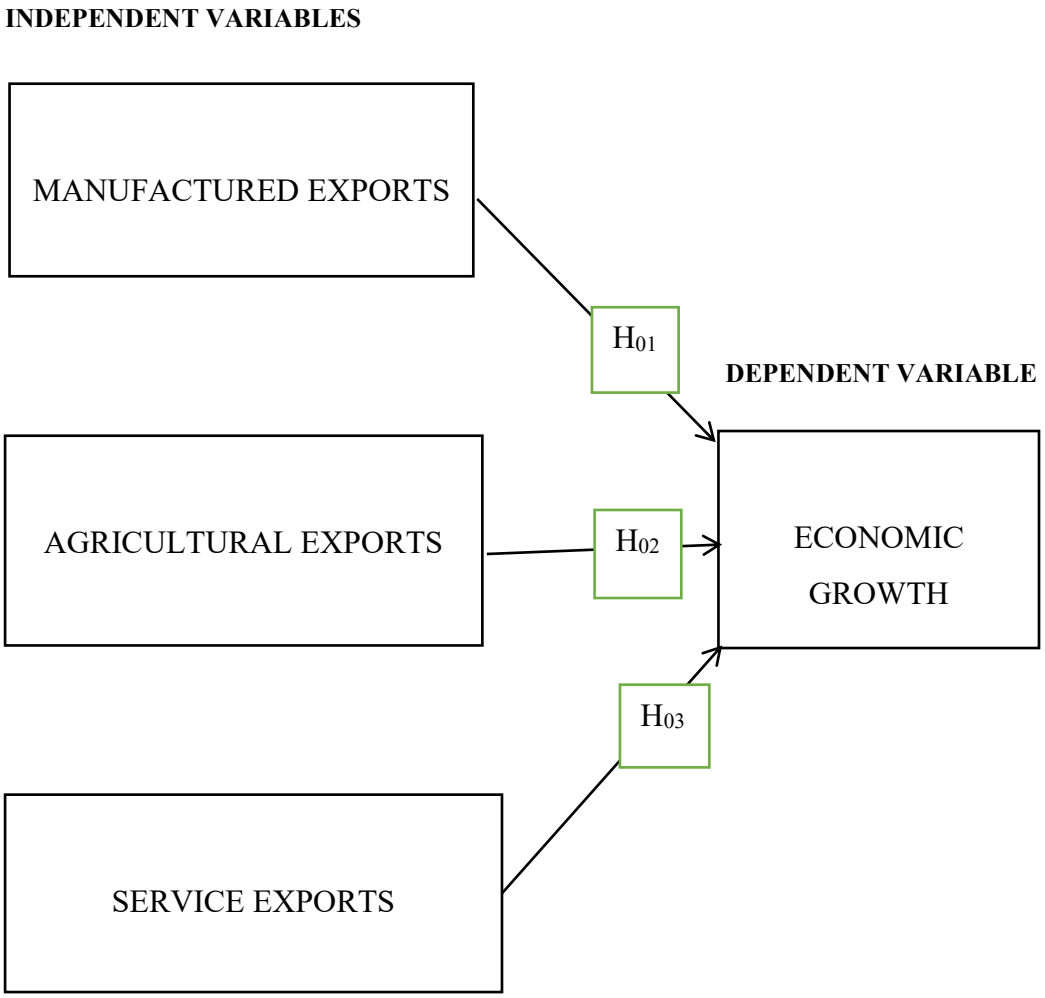

Figure 2.1: Conceptual Framework

Source: Researcher, 2025

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Overview

In this chapter, the researcher presented the research design, types of data and data sources, data analysis, model choice and specification, definitions of variables used, and model diagnostic checks are presented.

3.1 Research Design

A research design is a blueprint for the collection, measurement, and analysis of data (Kothari, 2004). According to Kothari (2004), research design is the overall framework outlining the approach for data collection and analysis with the aim of fulfilling the research purpose. It is the conceptual structure within which research is conducted.

Both descriptive and explanatory research designs were used in this study. The purpose of explanatory research was to determine the extent and nature of cause-and-effect relationships. Conversely, a scenario as it occurs naturally is depicted in a descriptive study approach (Burns & Grove, 2003). Secondary data on exports of manufactured exports, services exports, exports of agricultural products, and economic growth from 1990 to 2023 were used in the study.

3.2 Types and Sources of Data

Time series data was used, with data from the World Bank database being employed to provide information on GDP growth rate, manufacturing exports, agricultural exports, and service exports for the period 1990–2023. Calendar years were used to measure all the collected data.

3.3 Data Analysis

Data analysis was conducted using EViews 14 statistical software, employing both descriptive and inferential statistics. The analysis began with the Augmented Dickey-Fuller (ADF) test to check for unit roots in the series. The ARDL modeling technique was then applied to assess cointegration among variables, with the Schwarz Information Criterion used to determine the optimal lag length. To check for serial correlation in the residuals, the Breusch-Godfrey Serial Correlation LM Test was performed. The robustness of the ARDL model for forecasting was evaluated using the CUSUM test. Additionally, the Granger Causality test will be utilized to determine the direction of causation among the variables.

3.3.1 Choice and Specification of the Model

Here is how the empirical model was described:

$$\boldsymbol{GDP} = \int (\boldsymbol{ME}, \boldsymbol{AE}, \boldsymbol{SE}, €) \qquad \textbf{3.1}$$

Where:

$$\boldsymbol{GDP = Growth\ rate\ of\ Gross\ Domestic\ Product}$$

$$\boldsymbol{ME = Manufactured\ Exports\ in\ Fixed\ Prices}$$

$$\boldsymbol{AE = Agricultural\ Exports\ in\ Fixed\ Prices}$$

$$\boldsymbol{SE = Service\ Exports\ in\ Fixed\ Prices}$$

$$€ = \boldsymbol{Error\ term}$$

$$Other\ factors\ that\ explain\ Economic\ growth\ not\ included\ in\ the\ model$$

The following was the estimated linear form of the model with economic growth as the dependent variable:

$$\ln GDP_t = \beta_0 + \beta_1 \ln ME_t + \beta_2 \ln AE_t + \beta_3 \ln SE_t + \varepsilon \qquad 3.2$$

3.3.2 Description and Measurement of Study Variables and Expected Sign

Table 3.1:Description and Measurement of Study Variables and Expected Sign

Variable	Definition	Measurement	Expected Sign
Gross Domestic Product	A key economic indicator that measures the total monetary value of all goods and services produced within a country's borders during a specific period, typically a year	Annual percentage growth	Positive
Manufactured Exports	Value of goods that have been processed, assembled, or produced from raw materials and then sold to foreign markets.	Current US$	Positive
Agricultural Exports	Value of goods produced from farming and agriculture that are sold to foreign markets.	Current US$	Negative
Service Exports	Value of sale of intangible goods, or services, from one country to another.	Current US$	Positive

Source, Author Conceptualization, 2025

3.3.3 Stationarity Test

The first step involved testing for the presence of a unit root in the series. According to (Brooks, 2008), this procedure is crucial for ensuring that the series has a constant variance and mean, making the resulting regression model valid. If a series is stationary, it has no unit root and is integrated of order I(0), meaning it does not face estimation problems. Conversely, a non-stationary series requires differencing to achieve stationarity. The order of integration, as defined by (Engle & Granger, 1987) corresponds to the number of times a series needs to be differenced to become stationary.

To test for a unit root, we typically use two methods: the Phillips-Perron test and the Augmented Dickey-Fuller (ADF) test. This study will use the ADF test, which involves rejecting the null hypothesis that the series has a unit root (H0: ρ = 1).

An ADF model was written as:

$$\Delta Y_t = \boldsymbol{\Psi y_{t-1}} + \sum_{\boldsymbol{i=1}}^{\boldsymbol{p7}} \propto \Delta \boldsymbol{y_{t-1}} + \boldsymbol{\mu_t} \quad 3.3$$

3.3.4 Model Diagnostic Tests

3.3.4.1 Normality Test

Residuals should ideally be normally distributed, with a mean of zero and constant variance. To identify any potential misspecification issues, the residuals were examined. The Breusch-Godfrey Serial Correlation LM Test was conducted to assess whether the residuals exhibit serial correlation.

3.3.4.2 Cumulative Sum of Recursive Residuals (CUSUM) Tests

Macroeconomic variables, especially time series data, can be influenced by shifts in fiscal or monetary policy. Thus, testing the stability of these variables is crucial. The CUSUM test was employed to assess the structural stability of the modeled macroeconomic variables.

3.3.4.3 Determination of Optimum Lag Length

Determining the optimal lag length is crucial for ensuring that error terms are normal, free from non-stationarity, autocorrelation, and non-normality (Gaussian error terms). The optimal lag length was identified using the Schwarz Information Criterion (SIC). According to (Pesaran & Shin, 1998) the Schwarz Information Criterion (SIC) is preferred for lag selection because it provides a more parsimonious model specification and is particularly suitable for small data samples.

3.3.4.4 Cointegration

(Brooks, 2008) emphasized that constructing dynamic economic models necessitates a thorough examination of the characteristics of the time series data involved. Neglecting these features and modeling time series data jointly can lead to high correlations among variables in the resulting regression output. However, a high degree of correlation does not imply a causal relationship between the variables. In contrast, when two or more variables are cointegrated, as noted by (Engle & Granger, 1987), the likelihood of a spurious relationship is eliminated.

Cointegration tests such as the Engle and Granger two-step method (Engle & Granger, 1987), Phillips and Hansen (Phillips & Hansen, 1990) and Johansen maximum likelihood (Johansen & Juselius, 1990) typically require variables to be integrated of order I(1). However, there are instances where a linear combination of these variables can result in an I(0) variable, as noted by (Brooks, 2008).

The requirement for I(1) variables in cointegration testing does not always apply, as the order of integration can be influenced by factors such as the choice of lag length, the type of unit root test used, and whether a trend or constant is included in the unit root test. To address these challenges, the ARDL modeling technique will be employed to estimate cointegrating relationships, as recommended by (Pesaran & Shin, 1998). This technique facilitates the estimation of long-term relationships between variables and offers several advantages over traditional stationary series-dependent cointegration tests. Specifically, ARDL can handle variables that are I(0), I(1), or a combination of both integration orders, and it allows for the use of Ordinary Least Squares (OLS) to determine cointegration relationships. Additionally, the ARDL technique does not require symmetry in lag lengths, allowing for different numbers of lags for each variable.

A simple example of the ARDL scheme was presented as:

$$\boldsymbol{y_t = w + \propto y_{t-1} + \beta_0 x_t + \beta_1 x_{t-1} + \varepsilon_t} \qquad \textbf{3.4}$$

This model is denoted as ARDL (1,1) because both the dependent and explanatory variables are lagged by one period, as shown in equation one above. The ε series is assumed to be white noise. The ARDL model was estimated using the Ordinary Least Squares (OLS) method, as described by (Carter et al., 2008).

Based on equation (ii) above, the estimated ARDL model was:

$$\begin{aligned} \Delta \ln \boldsymbol{GDP_t} = {} & \boldsymbol{\alpha_0} + \sum_{i=1}^{p} \boldsymbol{\gamma}\, \Delta \ln \boldsymbol{GDP_{t-1}} + \sum_{i=1}^{p4} \boldsymbol{\Phi_1} \Delta \ln \boldsymbol{ME_{t-1}} \\ & - \sum_{i=1}^{p5} ¥_1 \Delta \ln \boldsymbol{AE_{t-1}} + \sum_{i=1}^{p6} ɾ_1 \Delta \ln \boldsymbol{SE_{t-1}} \\ & + ʊ_1 \ln \boldsymbol{GDP_{t-1}} + ʊ_4 \ln \boldsymbol{ME_{t-1}} - ʊ_5 \ln \boldsymbol{AE_{t-1}} \\ & + ʊ_6 \ln \boldsymbol{SE_{t-1}} + \boldsymbol{e} \end{aligned} \qquad 3.5$$

Where ʊs denote the long run model parameters.

To determine the short-run model parameters, we estimated the following Model:

$$\begin{aligned} \Delta \ln \boldsymbol{GDP_t} = {} & \boldsymbol{\alpha_0} + \sum_{i=1}^{p} \boldsymbol{\gamma}\, \Delta \ln \boldsymbol{GDP_{t-1}} + \sum_{i=1}^{p4} \boldsymbol{\Phi_1} \Delta \ln \boldsymbol{ME_{t-1}} \\ & - \sum_{i=1}^{p5} ¥_1 \Delta \ln \boldsymbol{AE_{t-1}} + \sum_{i=1}^{p6} ɾ_1 \Delta \ln \boldsymbol{SE_{t-1}} \\ & + ʊ_1 \ln \boldsymbol{GDP_{t-1}} + ʊ_4 \ln \boldsymbol{ME_{t-1}} - ʊ_5 \ln \boldsymbol{AE_{t-1}} \\ & + ʊ_6 \ln \boldsymbol{SE_{t-1}} + \boldsymbol{\eta ecm_{t-1}} \end{aligned} \qquad 3.6$$

Where γ, β, ψ, Φ, ¥, ɾ and Ω denote the short-term impact multipliers and η the speed of adjustment to equilibrium or the extent of disequilibrium correction in the model.

3.3.4.5 Granger Causality test

To establish the direction of causality, the Granger causality test was utilized. In econometrics, causality refers to the ability of one variable to predict and influence another. For two variables, say $X_t \; and \; Y_t$, which may affect each other, their relationship can be analyzed using a Vector Autoregressive (VAR) model. The possible outcomes of this analysis include: $X_t \; causes \; Y_t, Y_t \; causes \; X_t,$ bidirectional causality between the variables, or no causal relationship between them.

CHAPTER FOUR : RESULTS AND DISCUSSION

4.0 Overview

This chapter presents the data analysis, findings, and discussion of findings. The first section summarises the descriptive statistics of each of the variables in the study. After the descriptive statistics section, the next section describes the evaluation of the study model and the diagnostic tests conducted. The latter section presents the main data analysis and an evaluation of the research questions per objective.

4.1 Data Sources

The data utilized in this research were sourced from the World Bank Open Data Platform. The World Bank Open Data Platform is a comprehensive and authoritative repository with open access to credible global development indicators. The platform compiles standardized, internationally comparable datasets from over 200 countries and is a reliable source for time-series, longitudinal and cross-country economic analyses (Omole, 2017).

For this study, time series data spanning 1990 to 2023 was extracted to provide foundational data for historical perspective essential in econometric modelling. The dataset includes key economic indicators relevant to the study. These are, Gross Domestic Product (GDP) constant, and sector-specific exports, including manufacturing exports, services exports, and agriculture exports.

4.2 Descriptive Statistics

Descriptive statistics were generated for each variable to provide a preliminary understanding of the data distribution and the underlying trends. Table 4.1 below summarises the key descriptive statistics for each measure. The measures covered include mean, median, maximum, minimum, standard deviation, skewness, kurtosis,

and the Jarque-Bera test for normality. These metrics establish the foundation for further econometric analysis and model validation.

Table 4.1. Descriptive Statistics Summary

	GDP	Agricultural Exports	Manufacturing Exports	Services Exports	Total Exports
Mean	42784.27	4038.328	1808.378	7022.412	12869.12
Median	28891.85	3689.070	1877.305	6466.500	11891.79
Maximum	114449.0	7706.506	3741.659	15064.00	26111.17
Minimum	5751.787	1066.313	498.9784	2071.000	3901.247
Std. Dev.	36343.62	2090.513	1020.935	4062.456	7086.358
Skewness	0.696662	0.191232	0.123943	0.317214	0.263525
Kurtosis	2.029514	1.581849	1.594334	1.831702	1.679573
Jarque-Bera	4.084529	3.056361	2.886240	2.503844	2.863521
Probability	0.129735	0.216930	0.236190	0.285955	0.238888
Sum	1454665.0	137303.2	61484.84	238762.0	437550.0
Sum Sq. Dev.	43,600	144,000,000	34,396,154	545,000,000	1,660,000,000
Observations	34	34	34	34	34

Source: Author, 2025

4.2.1 GDP Descriptive Statistics

The descriptive statistics for GDP over the observed period reveal several critical insights about Kenya's economic performance and variability over time. Based on the result, the mean GDP was $42,784.27 million while the median was slightly lower at $28,891.85 million. This modest difference suggests a mildly right-skewed distribution. This view is supported by the skewness value of 0.70 as shown in the table above. According to Hair et al. (2010), skewness values between -2 and +2 are generally considered acceptable for normality assumptions in multivariate analysis (Hair, 2010). A positive skew implies that while most GDP values cluster below the mean, there are a few years with relatively high GDP figures that pull the average upward. According to Pesaran (2015), such a distribution is typical of growing economies like Kenya, which experience occasional high growth periods due to

favourable policy or global conditions (Pesaran, 2015).

Further, the results show a standard deviation of $36,343.62 million. At over 85% of the mean, the deviation is substantial and indicates high dispersion in GDP figures across the 34 years. This level of variation aligns with expectations for a macroeconomic aggregate like GDP. GDP is highly sensitive to structural reforms, commodity prices, inflationary trends, international shocks, and internal socio-political stability (Hamilton, 2011). There have been significant changes to Kenya's economic policies, multiple shocks, and periods of socio-political instability in Kenya that are likely to have contributed to the trend observed. High GDP variability has also been documented in empirical literature as a common trait among developing economies due to their exposure to exogenous shocks and limited fiscal buffers (Hamilton, 2011).

The kurtosis value of 2.03 suggests a platykurtic distribution, meaning that the distribution has lighter tails and a flatter peak compared to a normal distribution (kurtosis = 3). This indicates fewer extreme GDP observations and a more moderate distribution around the mean. While not problematic, it can imply that GDP does not frequently deviate to extreme highs or lows. This is a sign of some level of stability in long-term economic growth (Lütkepohl, 2013). The Jarque-Bera (JB) test statistic was 4.08 with a p-value of 0.13, which indicates the data is approximately normally distributed.

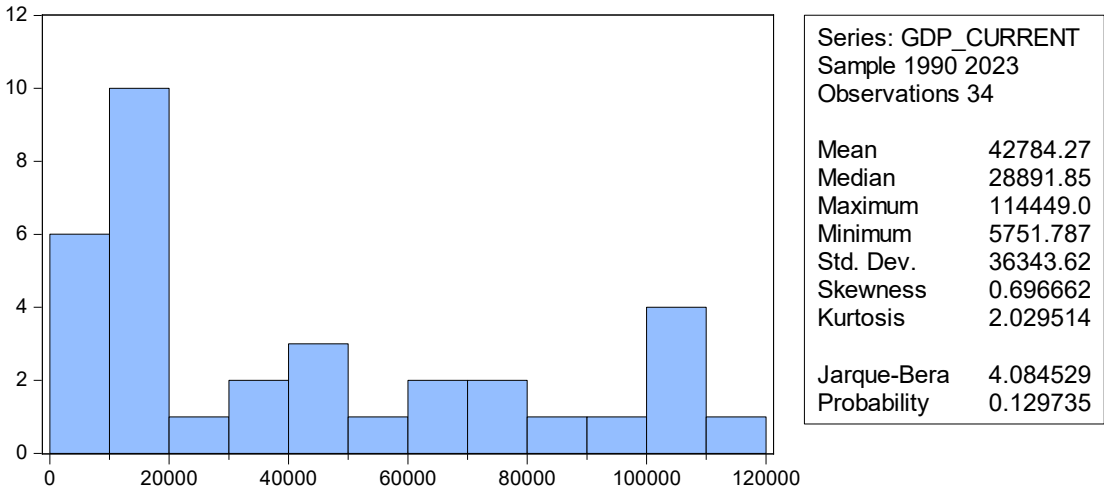

Figure 4.1. GDP Descriptive Statistics Summary

Source: Author, 2025

4.2.2 Total Exports Descriptive Statistics

The descriptive statistics for Kenya's total exports over the 34 years reveal substantial variation in export performance, with a mean value of $12,869.12 million and a median of $11,891.79 million. This suggests a relatively balanced distribution with a slight rightward skew. The minimum value recorded was $3,901.25 million, and the maximum reached $26,111.17 million, indicating a wide range in export performance over the period in review.

The standard deviation was $7,086.36 million, which shows a high level of dispersion around the mean at approximately 55%. The high dispersion reflects fluctuations driven by external shocks, global demand dynamics, and domestic supply-side factors. Such variability in macroeconomic indicators is common in developing economies and underscores the sensitivity of trade performance to both internal and external conditions (Hamilton, 2011).

The skewness (0.26) indicates a mild positive skew and suggests a few years with exceptionally strong export figures pulling the average upward. The kurtosis value of

1.68 indicates a platykurtic distribution with lighter tails and fewer extreme deviations compared to a normal distribution (kurtosis = 3). These features support the view that total export values were generally concentrated around the mean without frequent extreme values. Finally, the Jarque-Bera statistic of 2.86 with a p-value of 0.24 indicates that the distribution does not significantly deviate from normality. This supports the appropriateness of using parametric statistical methods for further analysis of total exports.

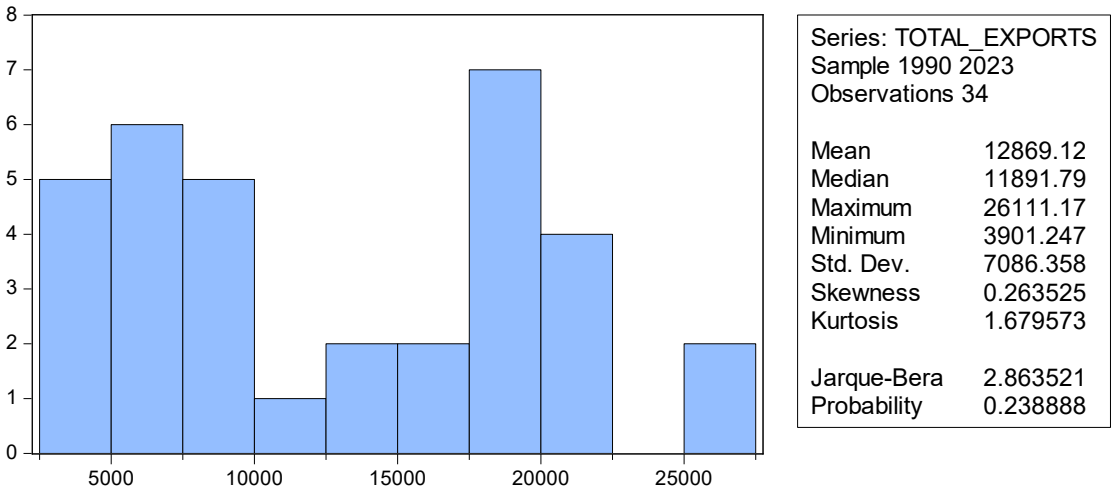

Figure 4.2. Total Exports Descriptive Statistics Summary

Source: Author

4.2.3 Agriculture Exports Descriptive Statistics

Kenya's agricultural exports recorded an average annual value of $4,038.33 million during the period in review. Export performance fluctuated significantly, with the highest annual exports reaching $7,706.51 million while the lowest export value was $1,066.31 million. Such notable variation reflects the sector's vulnerability to a wide array of external shocks. Adverse climatic events, global price volatility, trade policy shifts, and logistical disruptions undermine the stability of export earnings and can be attributed to agricultural export fluctuations (Neusser, 2016). The fluctuation is further highlighted by a standard deviation of $2,090.51 million, which represents nearly 52% deviation from the mean. The SD indicates a high level of dispersion

around the mean. Similar trends have been documented by Baffes (2022). The study noted that agricultural exports in Sub-Saharan Africa are frequently exposed to weather-related risks and market uncertainties (Baffes, 2022).

In Kenya's case, frequent droughts and fluctuating global demand for key export commodities, including tea, coffee, and horticultural products, can be attributed to the instability noted. Nonetheless, the skewness value of 0.19 suggests a relatively balanced distribution. The mild positive skew indicates that a few exceptionally strong years helped raise the overall average. This pattern aligns with findings by Minot (2016), who observe sporadic surges in export performance following favourable weather or global market conditions (Minot, 2016). The descriptive statistics for agriculture exports are summarised below.

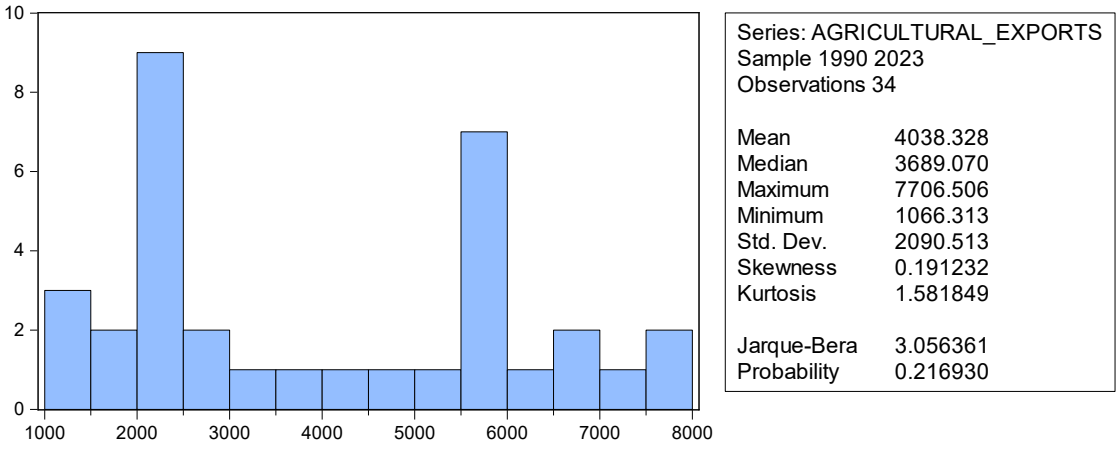

Figure 4.3. Agriculture Exports Descriptive Statistics Summary

Source: Author, 2025

4.2.4 Manufactured Exports Descriptive Statistics

From the findings, the mean and median for manufactured exports over the analysis period were $1,808.38 million and $1,877.31 million, respectively. The noticeable difference between the mean and median suggests a mild asymmetry in the

distribution of manufacturing export values. With a standard deviation of $1,020.94 million, the series data shows a moderate level of fluctuation in export performance across the years. Such variation is understandable given the sensitivity of manufacturing exports to factors like industrial capacity, regional demand, trade policies, infrastructure, and competitiveness in international markets (Marconi, Reis, & Araujo, 2013). The lowest recorded value was $498.98 million, while the highest Manufactured exports reached $3,741.66 million in the year in 2022. The huge variation highlights the unevenness in Kenya's manufacturing export performance over time. These figures reflect structural and cyclical changes such as shifts in global demand, currency volatility, and domestic industrial policy outcomes (Ijirshar, 2015).

A skewness of 0.12 denotes a slight positive skew and implies that there were more frequent occurrences of values below the mean than there were above the mean. Regardless, the level of skewness lies within the acceptable ±2 threshold as outlined by Hair et al. (2010) and supports the assumption of approximate normality (Hair, 2010). The kurtosis value of 1.59 indicates a platykurtic distribution, suggesting fewer extreme deviations from the mean. The Jarque-Bera test statistic was 2.89 with a p-value of 0.24. This result further affirms that the distribution of manufactured export data is reasonably normal.

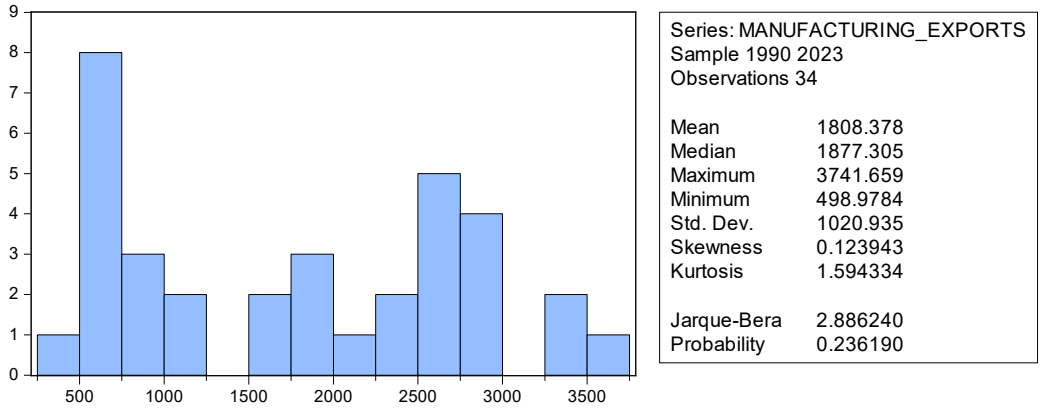

Figure 4.4 . Manufacturing Exports Descriptive Statistics Summary

Source: Author, 2025

4.2.5 Services Exports Descriptive Statistics

The analysis further reveals that Kenya's services exports had a mean value of $7,022.41 million over the 34-year period. However, there was a substantial standard deviation of $4,062.46 million. Such high variation at approximately 58% of the average, indicates significant fluctuations in annual service export earnings. Again, such volatility is typical in developing economies. For instance, services exports are subject to shifts in global demand, exchange rate movements, domestic capacity constraints, and exogenous shocks such as political instability or global crises (Gagnon et al., 2023). In Kenya's case, key contributors to services exports include tourism, transport, ICT, and financial services. All these sectors are highly sensitive to both domestic policy conditions and global economic cycles.

The minimum and maximum export values over the period were $2,071.00 million and $15,064.00 million, respectively. This represents a wide range in performance. The median stood at $6,466.50 million, which is close to the mean and indicative of a relatively symmetrical distribution. This is supported by a skewness value of 0.32, which suggests only a mild rightward skew (Hair, 2010). The Jarque-Bera statistic of

2.50 (p-value = 0.29) is not statistically significant and confirms the assumption that the distribution does not deviate markedly from normality and is thus suitable for parametric statistical procedures (Hair, 2010).

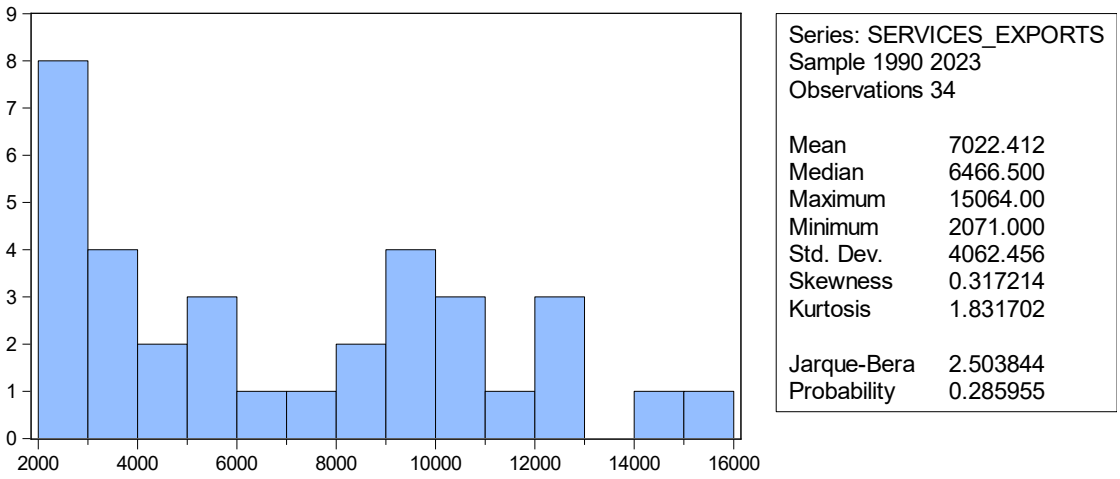

Figure 4.5. Services Exports Descriptive Statistics Summary

Source: Author, 2025

4.3 Diagnostic Tests of the Model

The first step in the analysis involved conducting a few diagnostic tests to evaluate the variables and the model. The following is a brief description of the tests done in this study and the corresponding results.

4.3.1 Unit Root Test

An ADF test was performed to determine whether the variables are stationary. According to Tanaka (2017), the stationarity test of time series data is critical to determine whether the mean and variance are constant over time (Tanaka, 2017). A non-stationary series has a unit root and typically exhibits random-walk behaviour. Such data can lead to misleading regression results due to spurious correlations and would hence not be suitable for accurate model estimation and forecasting. The hypothesis for the ADF test is then defined as shown below:

- Null Hypothesis: The series has a unit root, hence is non-stationary.

- Alternative Hypothesis: The series is stationary, meaning it does not have a unit root.

The test for GDP yielded an ADF statistic of 1.5462 and a p-value of 0.9982. The results suggest that the series is strongly non-stationary, as the test statistic does not exceed the 10% critical value in the negative direction. Hence, the null hypothesis is not rejected for the GDP unit root test. For manufactured exports, the ADF test statistic was -0.7891, which is well above the 1%, 5%, and 10% critical values (-3.6793, -2.9678, and -2.6230, respectively) with a p-value of 0.8156. This indicates the series contains a unit root and is non-stationary.

Similarly, agricultural exports produced an ADF statistic of -1.2308 and a p-value of 0.6562. The test statistic is far from the threshold required to reject the null hypothesis, affirming that this series is also non-stationary and possesses a unit root. The ADF test statistic for services exports was -0.9484 with a p-value of 0.7597. Like the other variables, the test statistic did not exceed the critical values at conventional significance levels, and the p-value supports retaining the null hypothesis of non-stationarity.

Additionally, total exports were tested and yielded an ADF statistic of -0.8439 and a p-value of 0.7971. The statistic lies above the critical thresholds, and the high p-value reinforces the conclusion that the total exports series is also non-stationary.

Overall, the ADF tests across all five variables indicate the presence of unit roots, hence the decision to fail to reject the null hypothesis in each case. When time series data is non-stationary, transformations such as first differencing or logarithmic transformation are recommended (Tanaka, 2017). The essence of transformation is to

achieve stationarity before conducting further modelling. In this case, differencing was conducted, and the results are summarised below.

Table 4.2. ADF Test Results Summary

Variable	ADF Test Statistic	p-value	Stationary?
GDP	1.5462	0.9982	No
Manufactured Exports	-0.7891	0.8156	No
Agriculture Exports	-1.2308	0.6562	No
Services Exports	-0.9484	0.7597	No
Total Exports	-0.8439	0.7971	No

Source: Author, 2025

4.3.2 ADF Test Summary After Differencing

After first differencing, the ADF test statistic for GDP was -3.1421 with a p-value of 0.0333. This is below the 5% critical value of -2.96 and indicates that the GDP variable is stationary after first differencing. Similarly, the ADF test for agriculture exports yielded a test statistic of -6.0753 and a p-value of 0.0000, which is well below the 1% critical value of -3.65. This suggests that agricultural exports also do not have a unit root and are stationary. The ADF test for Manufactured resulted in a test statistic of -2.4400 and a p-value of 0.1399, which does not reject the null hypothesis at the 5% level (critical value -2.96). Thus, the variable is not conclusively stationary after differencing and may require further testing. Finally, the ADF test for services returned a test statistic of -6.0320 and a p-value of 0.0000. This is lower than the 1% critical value of -3.65. As with the other variables, this confirms that the services exports variable is stationary after first differencing.

The ADF test results after first differencing indicate that most variables become stationary, which means the data stabilizes after removing trends or patterns over time. Confirming stationarity after first differencing means the variables are integrated of order one, I(1), and are suitable for ARDL modelling. In addition to the sector-specific exports, the ADF test for Total Exports after first differencing yielded a test statistic of -5.5753 with a p-value of 0.0001. This is well below the 1% critical value of -3.65 and confirms that Total Exports are also stationary after first differencing.

Table 4.3: Unit Test Summary

Variable	T-statistic	p-value	Stationarity Level
GDP	-3.1421	0.0333	1st Difference
Manufactured	-2.4400	0.1399	Inconclusive
Agriculture	-6.0753	0.0000	1st Difference
Services	-6.0320	0.0000	1st Difference
Total Exports	-5.5753	0.0001	1st Difference

Source: Author, 2025

4.4 Model Specification

4.4.1 Lag Length Selection

To determine the optimal lag length for the model, multiple Vector Autoregression (VAR) Lag Order Selection Criteria were employed, including the Schwarz Information Criterion (SC), Akaike Information Criterion (AIC), and the Hannan-Quinn Criterion (HQ). Among these, the Schwarz Information Criterion, which uses a natural logarithm form for lag selection, was prioritized due to its consistency in smaller samples (Tanaka, 2017). The test results varied across the export variables, indicating different optimal lags per series.

Table 4.4 VAR Lag Order Selection Criteria Summary

Lag	LogL	AIC	SC	HQ
0	-420.38	26.429	26.721	26.545
1	-390.27	25.017	25.986	25.386
2	-376.81	**24.561**	26.208	**25.183**
3	-375.42	24.589	26.913	25.464
4	-362.50	24.732	**27.734**	25.861

Source: Author

Based on these findings, a mixed lag structure of (agricultural export = 4, services export = 0, manufacturing export = 2, Total export = 0) was recommended to best capture the dynamic relationships between the variables while avoiding over-parameterization. This means that agricultural exports require four lags, allowing the model to account for up to four past periods' influence on current values, which reflects the longer adjustment process observed in this sector. Manufacturing exports were assigned two lags, capturing more immediate but still persistent dynamics. In contrast, services exports and total exports showed optimal lag lengths of zero, indicating that past values beyond the current period did not significantly improve the model fit for these variables.

This differentiated lag structure ensures that the model is flexible enough to accommodate variable-specific temporal dependencies, reflecting their distinct economic behaviours and time horizons. It also prevents the inclusion of unnecessary lags that could lead to overfitting and reduce the model's forecasting power. The selection of this lag structure aligns with economic theory and empirical practice, as overfitting can distort causality and impulse response analyses (Cabanilla, 2019). Subsequent VAR-based estimations and diagnostic tests were therefore conducted

using this mixed lag specification.

4.5 ARDL Model

The study employed the Autoregressive Distributed Lag (ARDL) model to examine the short-run and long-run dynamics between Kenya's GDP growth and exports, on the one hand, and GDP growth and sectoral outputs in agriculture exports, manufactured exports, and services exports. The ARDL approach was deemed appropriate given that the variables were integrated of order I(0) and I(1), as determined through unit root tests. ARDL is particularly useful in small sample sizes and allows for lag structure flexibility, enabling the modelling of both contemporaneous and lagged effects of the independent variables on GDP (Neusser, 2016).

The application of ARDL is supported in empirical literature focusing on the relationship between sectoral contributions and economic growth. (Pesaran, 2015) recommends ARDL due to its effectiveness in analysing dynamic relationships involving mixed-order integration (Pesaran, 2015). Similar approaches have been adopted by Oyinlola and Adeniyi (2020) and (Baffoe-Bonnie, 2021), who investigated sectoral growth patterns in sub-Saharan Africa using ARDL models (Oyinlola, 2020). These studies reinforce the model's suitability for examining the impact of agriculture, manufacturing, and services on GDP in Kenya.

4.5.1 Model 1: Effect of Total Exports on GDP

The ARDL model 1 was estimated for the relationship between GDP and total exports over the period from 1992 to 2023. The model reveals a statistically significant association between total exports and GDP. Firstly, the results demonstrate an overall model fit with the data very with a R-squared value of 0.9929. This implies that

approximately 99.29% of the variation in GDP is explained by the lagged values of GDP and total exports. The adjusted R-squared value of 0.9919 further confirms the robustness of the model fit. Additionally, the model is shown to be statistically significant with an F-statistic of 946.43 and a p-value of less than 0.001. This indicates that the explanatory variable (total exports) has a significant effect on GDP.

The first lag of GDP has a positive and statistically significant effect on GDP. Based on the results, a one-unit increase in GDP from the previous period, holding other factors constant, leads to a 1.078-unit increase in GDP. This finding highlights the persistence of economic growth, given that past performance strongly influences the present output level. In contrast, the second lag of GDP is not statistically significant. This suggests that GDP from two periods prior does not have a meaningful impact on the GDP once the immediate lag is accounted for.

Regarding total exports, the current value of total exports also shows a significant positive effect on GDP. Specifically, a one-unit increase in total exports corresponds to an increase of approximately 0.931 units in GDP. This confirms the theoretical expectation that exports are an important driver of economic output. However, the lagged value of total exports from the previous period is not statistically significant.

4.5.2 Model Diagnostic Tests

The purpose of conducting model diagnostic tests is to evaluate the reliability and validity of the ARDL model results. For the two models' serial correlation, heteroskedasticity, and the Skewness/Kurtosis test for normality of residuals were tested. These tests are essential for identifying potential issues in the model that could undermine the accuracy of the estimates and the validity of the inferences drawn from the analysis.

4.5.3 Serial Correlation Test

To check for the presence of serial correlation in the residuals of the regression model, a Breusch-Godfrey LM test for autocorrelation was conducted with 2 lags. According to Lutkepohl (2013) serial correlation occurs when error terms across different time periods are correlated (Lütkepohl, 2013). Serial correlation invalidates standard errors and test statistics, leading to unreliable inference. The test results show a chi-square statistic of 3.859 with 2 degrees of freedom and a p-value of 0.1452. Since the p-value is greater than 0.05, we fail to reject the null hypothesis of no serial correlation. This indicates that there is no statistically significant evidence of autocorrelation up to lag 2 in the residuals of the model.

lags(p)	chi2	df	Prob > chi2
2	3.859	2	0.1452

Figure 4.6. Breusch-Godfrey LM test for autocorrelation
Source: Author

The absence of serial correlation suggests that the model residuals are independent over time, supporting the validity of the standard errors, t-tests, and overall inference from the regression. This improves confidence that the estimated relationships between GDP and total exports, including their lags, are not biased or misleading due to correlated error terms.

Therefore, the Breusch-Godfrey test results support the adequacy of the model specification regarding autocorrelation, implying that the model residuals behave well and that the lag structure is appropriate for capturing the dynamics in the data.

4.5.4 Test for Heteroskedasticity

One of the critical assumptions of the classical linear regression model is homoskedasticity. The presence of homoskedasticity indicate that the variance of the error terms remains constant across all levels of the independent variables. According to Wooldridge (2013), Heteroskedasticity affects the reliability of hypothesis testing, confidence intervals, and model inference, and a violation of this assumption leads to biased standard errors (Wooldridge, 2013). This study employed the Breusch-Pagan / Cook-Weisberg (BP/CW) test to examine whether the variance of residuals from a regression model depends on the fitted values of the dependent variable. The following is a summary of the hypothesis tested.

> **Null Hypothesis (H_0):** The variance of the error terms is constant (homoskedasticity).
>
> **Alternative Hypothesis (H_1):** The variance of the error terms varies with the level of the fitted values

The BP/CW test yielded a Chi-square statistic of 17.80 with 1 degree of freedom and a p-value of 0.0000. The p-value is below the standard significance threshold of 0.05. As such, we reject the null hypothesis of constant variance. This result provides strong evidence of heteroskedasticity in the residuals of the ARDL model. The presence of heteroskedasticity suggests that the residuals do not have a constant variance, essentially violating one of the Gauss-Markov assumptions (Wooldridge, 2013). Consequently, the results call for a cautious interpretation of the statistical significance of coefficients.

Table 4.5. Breusch-Pagan / Cook-Weisberg Heteroskedasticity Test

Test	Chi-square (χ^2)	Degrees of Freedom	p-value	Decision
Breusch-Pagan / Cook-Weisberg	17.80	1	0.0000	Reject H_0 (Heteroskedasticity detected)

Source: Author

4.5.5 Robust Standard Errors Test and Results

To address the heteroskedasticity, a Robust standard errors test was conducted. Robust standard error tests were used to provide a more reliable inference (Wooldridge, 2013). In this case, the regression model was re-estimated using robust standard errors. The model regressed GDP on its first and second lags and current and lagged total exports. The results show that the model remains statistically significant with an R-squared value of 0.9929. This indicates that approximately 99.29% of the variation in GDP is explained by the model. The F-statistic is 785.57 ($p < 0.001$), confirming a strong model fit even after correcting for heteroskedasticity.

However, the second lag of GDP and the lagged value of total exports are not statistically significant. The constant term is also not significant, which indicates that it has limited interpretive value. Overall, the use of robust standard errors confirms the reliability of the model's key findings, especially the significance of exports on GDP performance.

Table 4.6. Robust Standard Errors Test Summary

Variable	Coefficient	Robust Std. Error	t-Statistic	p-Value	Significance
L1.gdp	1.078	0.327	3.29	0.003	**Significant**
L2.gdp	-0.153	0.332	-0.46	0.649	Not Significant
tot_exp	0.931	0.300	3.10	0.004	**Significant**
L1.tot_exp	-0.411	0.412	-1.00	0.327	Not Significant
Constant	-1519.813	1555.735	-0.98	0.337	Not Significant

Source: Author

4.5.6 Model 2: Effect of Agriculture, Manufacturing, and Services Export on GDP

The table below summarises the ARDL test results; a detailed summary is attached in Appendix VI.

Table 4.7. ARDL Results Summary

Variable	Coefficient	Std. Error	t-Statistic	p-Value
ΔGDP (t−1)	0.7011	0.2131	3.29	0.004
ΔManufactured	0.1965	0.1778	1.11	0.282
ΔManufactured (t−1)	−0.3485	0.1946	−1.79	0.088
ΔServices	−0.1011	0.0965	−1.05	0.307
ΔServices (t−1)	0.0030	0.1058	0.03	0.978
ΔAgriculture	−0.0024	0.2287	−0.01	0.992
ΔAgriculture (t−1)	0.6889	0.2998	2.30	0.032
Constant	−0.9221	0.4728	−1.95	0.065

Source: Author, 2025

The ARDL model estimation yielded an F-statistic of 327.31 (p = 0.0000). These stats indicate that the overall model is highly statistically significant. To interpret the results show that the combined effect of all the independent variables explains short-run variations in GDP growth. The R-squared value of 0.9945, as shown in the summary table, implies that 99.45% of the variation in GDP is accounted for by the model, while the adjusted R-squared (0.9914) reflects a very good model fit after adjusting for the number of predictors. Additionally, the Root Mean Square Error (RMSE) of 0.0878 indicates low residual dispersion. This further confirms the strong predictive performance.

However, some of the explanatory variables were not statistically significant at conventional and lagged levels. To illustrate, the lagged value of GDP had a coefficient of 0.7011 (p-value = 0.004). This suggests statistically significant short-run persistence in GDP growth. The second lag of GDP (c = −0.0757, p = 0.622), however, is insignificant. Manufacturing exports showed mixed effects. On the one hand, the current period coefficient was 0.1965 (p = 0.282) while its first lag was −0.3485 (p = 0.088) and the second lag was 0.4111 (p = 0.035). In essence, the results indicate that lagged manufacturing exports have some significant short-run impact on GDP. Of the three sectoral variables explored, only service exports showed no significant short-run impact, given the current and lagged coefficients of −0.1011 (p = 0.307), 0.0030 (p = 0.978), and −0.0507 (p = 0.613), respectively. Agricultural exports were also statistically insignificant in both the current (–0.0024, p = 0.992) and lag 2 periods (−0.1676, p = 0.496). The first lag of agricultural exports was statistically significant, which indicates a potential delayed effect on GDP. The constant term, estimated at −0.9221 (p = 0.065), was also not statistically significant,

suggesting that baseline GDP growth may not be independent of the explanatory variables in this model.

Overall, the model suggests that in the short run, there is a strong relationship between lagged values of GDP, manufacturing, and agriculture exports with GDP, although other sectors like services remain insignificant. The results suggest that the short-run relationships between sectoral exports and GDP growth are partially significant. This is true for lagged manufacturing and agricultural exports. The results imply that certain sectors may influence GDP with a delay, while others exert minimal short-term effects. The findings also suggest that a significant portion of GDP variation is explained by its own lagged values, which can be construed to mean that GDP is explained more by structural momentum in economic activity than the sectoral exports explored.

4.5.7 Serial Correlation Test: Breusch-Godfrey LM Test

The table below summarises the results of the serial correlation test conducted:

Table 4.8 . Breusch-Godfrey LM test for autocorrelation

Breusch-Godfrey LM Test for Autocorrelation			
Lags (p)	**Chi²**	**DF**	**Prob > Chi²**
1	**1.398**	**1**	**0.2370**

Source: Author, 2025

To test for serial correlation, the Breusch-Godfrey (BG) test was conducted. The BG test is a diagnostic tool for detecting autocorrelation in the residuals of regression models, especially for time series data (Breusch, 1978). Serial correlation violates the classical assumption that error terms are uncorrelated (Wooldridge, 2013) and can lead to inefficient estimates and invalid inference if not addressed. The BG test allows

for testing higher-order autocorrelation and is preferred when lagged dependent variables are included in the model, as is the case in ARDL models (Wooldridge, 2013).

In this case, a Breusch-Godfrey LM test was performed with 1 lag. The results (summarised in Table 4.9 below) show a chi-square statistic of 1.398 with 1 degree of freedom and a p-value of 0.2370. In this case, we fail to reject the null hypothesis of no serial correlation in the residuals, given the p-value exceeds the conventional significance level of 0.05 (Hair, 2010). The results indicate that there is no statistically significant evidence of autocorrelation in the model errors. As such, we assume that the residuals are independent over time and that the model estimates are not biased by serial correlation.

4.5.8 Heteroskedasticity Test

The results of the Breusch-Pagan test are summarised in the table below.

Table 4.9. Heteroskedasticity Test Summary

Test	Chi²	p-value
Breusch-Pagan / Cook-Weisberg	2.39	0.1219

Source: Author, 2025

The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity examines whether the variance of the residuals from the ARDL model is constant across observations. From the results indicated in the table above, the test yielded a chi-square statistic of 2.39 with a p-value of 0.1219. In this case, we fail to reject the null hypothesis of homoskedasticity given that the observed p-value (0.1219) is greater than 0.05. The result implies that there is no statistically significant evidence of heteroskedasticity in the model, indicating that the variance of the error terms is approximately constant.

This shows that there is no immediate need to correct for heteroskedasticity and that standard inference procedures remain valid under this assumption.

4.5.9 Normality of Residuals

The Skewness/Kurtosis test for normality was conducted to assess whether the residuals from the ARDL model follow a normal distribution. Normal distribution is a key assumption for valid statistical inference in regression analysis (Wooldridge, 2013). The test produced a skewness p-value of 0.6162 and a kurtosis p-value of 0.2722. The combined adjusted chi-square statistic was 1.56 with a corresponding p-value of 0.4590. Since this p-value is greater than the conventional threshold of 0.05, we fail to reject the null hypothesis of normality. This indicates that there is no statistically significant evidence to suggest that the residuals deviate from a normal distribution. The results support the validity of the normality assumption in the model. The figure below shows the skewness test confirming minimal deviation from the normal distribution.

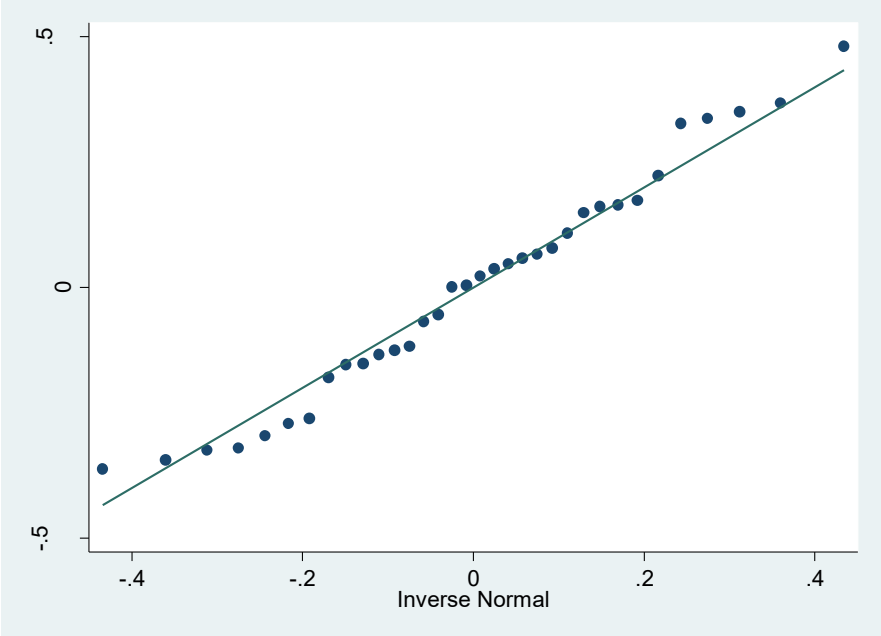

Figure 4.7. Skewness/Kurtosis test

Source: Author

4.5.10 The Granger Causality Test

The Granger causality test was conducted using a Vector Autoregression (VAR) model in first differences to examine whether exports in manufacturing, services, and agriculture Granger-cause GDP in Kenya, and vice versa. The results indicate no evidence of Granger causality in either direction (Wooldridge, 2013; Hair, 2010). Specifically, the p-values for the causality of manufacturing ($p = 0.461$), services ($p = 0.291$), and agriculture exports ($p = 0.186$) on GDP were all above 0.05 (Wooldridge, 2013). The joint test of all exports yielded a p-value of 0.137 and further supporting the absence of short-run predictive relationships. Similarly, tests assessing whether GDP Granger-causes sectoral exports also yielded non-significant results, indicating no short-term causality from GDP to exports. These findings suggest that short-run changes in exports do not significantly improve the prediction of GDP beyond its own past values.

Several factors may explain these findings. As a developing economy, Kenya often experiences structural rigidities and policy lags, which can weaken observable short-run dynamics between macroeconomic variables (Cabanilla, 2019). Moreover, the use of aggregated export categories may obscure sector-specific effects, a problem known as aggregation masking (Baffoe-Bonnie, 2021). For instance, within the agriculture export category, sub-sectors like tea may behave differently from horticulture, yet these dynamics are averaged out. Furthermore, the first-differencing process used in the model removes long-run trends, limiting the ability to detect enduring structural relationships between GDP and exports. These results highlight the need for disaggregated analysis and long-run models to better understand the export-growth nexus in Kenya.

4.6 Discussion of Results

4.6.1 Effect of Exports on GDP

The results of Model 1 align with the theoretical expectation of the export-led growth hypothesis. Under the export-led growth hypothesis, it is expected that an increase in exports leads to economic growth. The increase in GDP is a direct impact of trade and, through a multiplier obtained from exports ability to stimulate production, increase foreign exchange earnings, and enhance efficiency through exposure to global competition (Ahdi, Goodness, Mehmet, & Rangan, 2013). The results showing a statistically significant positive effect of total exports on GDP support this view. The results indicate that Kenya's economic growth can be partially linked to its export performance during the 1990–2023 period. Further, the statistical significance and strength of the relationship suggest that export performance is a key determinant of Kenya's short-run economic fluctuations and growth. This assertion is supported by the strong model fit, which indicates that changes in GDP are largely accounted for by variations in exports and past GDP values.

The significance of the first lag of GDP and the insignificance of the second lag reinforce the idea of short-term persistence in growth. The lag statistics indicate that recent economic performance influences the current period more than distant past values. This temporal structure aligns with endogenous growth models that emphasize recent investments, productivity, and macroeconomic policies as immediate drivers of output (Amakom, 2012).

While the presence of heteroskedasticity indicates some variability in error terms, the core relationships in the model remain robust after correction. The variability is possibly due to structural shifts in the economy or trade policy changes over the three-

decade period, rather than the data structure (Wooldridge, 2013) This suggests that the link between exports and GDP has been consistent despite structural changes. These findings validate the export-led growth theory in the Kenyan context and underscore the importance of maintaining and enhancing export competitiveness.

4.6.2 Effect of Manufacturing, Service, and Agriculture Exports on GDP

Overall, the results suggest that sectoral exports exhibit limited short-run significance. To illustrate, the only statistically significant variables at the 5% level were the first lag of agricultural exports and the first lag of GDP, indicating limited but meaningful delayed effects. **The first objective of the study was to evaluate the effect of manufactured exports on economic growth in Kenya.** The ARDL estimation reveals a current period coefficient for manufactured exports of 0.1965 with a p-value of 0.282, while the first lag is −0.3485 (p = 0.088). This result partially supports the hypothesis that manufactured exports affect economic performance in the short run. As such, the model fits the theoretical expectation based on the Export-Led Growth (ELG) hypothesis, which posits that increased exports can stimulate economic growth (Kalaitzi, 2018). Empirical evidence also supports the positive correlation between manufacturing exports and growth. For instance, studies by Giles and Williams (2000), and Helpman and Krugman (1985), suggest a strong export-growth nexus in many Asian and Latin American economies (Helpman, 1985; Giles, 2000).

However, in developing economies such as sub-Saharan Africa, the ELG relationship tends to be weaker or delayed as is evident from the results. For instance, Augier (2023) found that the contribution of manufactured exports to growth in East Africa was marginal due to low value addition and structural rigidities (Augier, 2023). Similarly, Santos-Paulino (2002) argues that while trade liberalization boosts exports,

its impact on GDP in low-income countries is often constrained by supply-side factors (Santos-Paulino, 2002).

A study by Were (2016) on the challenges of manufacturing in Kenya showed that the structure of the manufacturing sector and its contribution to GDP minimizes the influence of manufacturing export on economic growth (Were, 2016). In Kenya, manufacturing contributes between 7% and 10% of GDP, and hence, the possible reason for the weak correlation between manufactured exports and Kenya's GDP as expected in theory.

The second objective of the study was to evaluate the effect of agricultural exports on economic growth in Kenya. For agricultural exports, the ARDL model output a current period coefficient of –0.0024 ($p = 0.992$) and the first lag coefficient of 0.6889 ($p = 0.032$). While the current value is statistically insignificant, the first lag is statistically significant at the 5% level. The result indicates that agricultural exports have a delayed but statistically significant short-run impact on GDP growth. Theoretically, the Agricultural-Led Growth Hypothesis (ALG) posits that the agriculture sector can serve as a primary engine of growth in the early stages of economic development. Agriculture stimulates growth by increasing demand for industrial goods, generating foreign exchange, and increasing demand for inputs (Amakom, 2012). In the Kenyan context, the expectation is that increased agricultural exports should enhance rural incomes, improve productivity, and support structural transformation.

Empirical evidence supports this theoretical view. For example, A study by Ahdi et al., (2013), showed that improvements in agricultural productivity and exports contributed significantly to long-term growth in several developing countries (Ahdi,

Goodness, Mehmet, & Rangan, 2013). Similarly, Alam and Myovella (2016), found that agricultural growth had a strong impact on poverty reduction and GDP growth across sub-Saharan Africa (Alam & Myovella, 2016). However, the impact of agricultural exports on growth may be limited or delayed due to structural and institutional weaknesses. Were (2016) observed that despite increased agricultural exports in East Africa, their impact on GDP remained muted due to underinvestment, poor infrastructure, and limited value addition (Were, 2016).

This result may seem surprising given the agriculture sector's historic importance in Kenya's economy. However, several factors could explain the nature of the weak correlation. Firstly, agriculture in Kenya remains predominantly subsistence-based and highly vulnerable to weather patterns, pests, and price volatility (FAO, 2020). The short-run output from agricultural exports may fluctuate significantly and undermine agriculture's consistency as a growth driver. Kenya's agriculture exports majorly constitute major cash crops such as coffee, tea, and horticulture, which are currently well integrated into global markets. However, value addition is minimal even for such major agricultural exports. Regardless, the lagged significance indicates that when export revenues eventually feed through the economy, they may influence GDP with a time delay.

The third objective was to evaluate the effect of service exports on economic growth in Kenya. Based on the ARDL model result, there was no statistically significant relation between service exports and GDP, with a current period coefficient of −0.1011 ($p = 0.307$) and the first lag at 0.0030 ($p = 0.978$). All coefficients are statistically insignificant, suggesting that service exports do not significantly influence Kenya's GDP in the short run, despite their growing prominence in Kenya's export mix.

Several explanations could account for this outcome. Kenya's service exports are dominated by tourism, logistics, and basic ICT services. Most of such service exports are low-value or informal services and may exhibit high seasonality and vulnerability to external shocks (KNBS, 2022). The informal nature of many service activities leads to underreporting and data limitations, which may attenuate the observed relationship between service exports and GDP. Further, the services sector may have indirect effects on GDP that are not immediately captured in the models. For instance, improved ICT infrastructure may raise productivity over time but not produce immediate GDP gains. The study by Eichengreen & Gupta (2013) on services-led growth in developing countries notes that services tend to have stronger long-run impacts, especially when they support other productive sectors like manufacturing or finance (Einchengreen & Gupta, 2013). The fact that the service sector has only gained focus in the recent period may explain the lack of significance in influencing GDP as observed in the model.

These findings underscore the need for Kenya to reengineer the structure of the three main export sectors to benefit from export-led growth. The result shows the broader reality that GDP movements in Kenya may be more strongly influenced by macroeconomic factors outside of export composition. Additionally, the presence of a statistically significant F-statistic (327.31, $p = 0.000$) and a strong model fit (adjusted R-squared = 0.9914) imply that the overall model captures GDP variations effectively. However, the lack of cointegration detected through bounds testing emphasizes that sectoral exports and GDP do not share a stable long-run relationship in the current model setup. This may reflect the need for deeper structural transformation and economic diversification to strengthen the connection between exports and GDP growth.

From a policy standpoint, these results suggest that efforts to stimulate economic growth through exports must address structural bottlenecks in each sector. The results show an underlying need to improve value addition in manufacturing, modernize agriculture, and enhance the global competitiveness of services. Moreover, complementary reforms in infrastructure, governance, trade logistics, and the investment climate are needed to ensure that gains from exports translate into meaningful GDP growth.

Of the three subsectors, agriculture appears to offer the most immediate and statistically significant impact on GDP, albeit with a time lag. As such, Kenya can prioritize the modernization and commercialization of the agricultural sector to leap as a priority to leap from its potential. This can be done by improving value addition, enhancing export logistics, and promoting resilience through climate-smart practices. While manufacturing and services show promise in theory, their actual short-run influence on GDP is currently limited due to structural constraints and insufficient value capture. A balanced approach to investments can also be adopted to incrementally benefit from potential in all the sectors. In manufacturing, the focus should be on upgrading industrial capabilities and increasing export complexity. In the services sector, particularly ICT and financial services, on further improve infrastructure. Ultimately, a targeted strategy that accelerates agricultural productivity in the short term while laying the foundation for robust manufacturing and service export growth in the medium to long term would be most effective in achieving sustainable economic growth.

4.7 Hypothesis Testing Results

This section presents the results of the data analysis based on the key objectives of the study. This study aimed to evaluate the effect of economic composition on Kenya's economic growth. Economic growth in this case was measured by GDP, as the base export variables measured included manufactured products, agricultural products, and services exports. The relation between the export variables and GDP was analysed using an ARDL model, detailed in Chapter 3 of the study. Before deploying the model, several preliminary tests were conducted to determine the nature of the time series data and the appropriate lag given the inherent quality of the data. The data used in the study were gathered from the World Bank Data forum and are attached in Appendix VII. The Following is an In-depth evaluation of each of the study objectives.

Hypothesis 1 (H_{01}): There is no significant influence of manufactured Exports on economic growth in Kenya

The ARDL model for manufactured exports yielded a coefficient of 0.2312 for the period, which is statistically insignificant with a p-value of 0.929. A lagged coefficient was -3.1625, and a p-value of 0.227 is also statistically insignificant (Hair, 2010). However, the second lag of manufactured exports showed a statistically significant coefficient of 0.4111 with a p-value of 0.035. These results suggest that while current and first-lagged fluctuations in manufactured exports do not significantly contribute to short-run economic growth in Kenya, delayed effects from earlier export performance may have a meaningful impact (Amakom, 2012). Despite manufacturing being a key sector, the lack of statistical significance in the short-term variables and the presence of delayed significance imply that other factors may be more influential in shaping GDP growth in the immediate term.

Hypothesis H_{O2}: There is no significant influence of agricultural Exports on economic growth in Kenya

For agricultural exports, the current period coefficient was –0.0024 (p-value of 0.992), the first lag coefficient was 0.6889 (p = 0.032) and the second lag coefficient was –0.1676 (p = 0.496) (Hair, 2010). While the current and second lag coefficients are statistically insignificant, the first lag is statistically significant at the 5% level. The results suggests that agricultural exports have a delayed short-run impact on economic growth in Kenya. This may be attributed to a time lag, given that agricultural export earnings take time to translate into broader economic activity (Alam & Myovella, 2016). The findings may also reflect structural bottlenecks in the sector that limit immediate transmission of gains to GDP.

Hypothesis H_{O3}: There is no significant influence of service exports on economic growth in Kenya

The ARDL results for service exports showed a current period coefficient of –0.1011 with a p-value of 0.307, a first lag coefficient of 0.0030 with a p-value of 0.978, and a second lag coefficient of –0.0507 with a p-value of 0.613. All coefficients are statistically insignificant. This means that service exports do not have a significant short-run impact on economic growth in Kenya (Tanaka, 2017). This may be due to the dominance of low-value or informal service exports, delayed economic feedback, or broader macroeconomic factors that dilute the immediate impact of the services sector on GDP growth (Bbaale & Mutenyo, 2011).

Table 4.10. Short-Run Dynamic Effects of Sectoral Exports on GDP

Sector	Current Coefficient	p-Value	Lag 1 Coefficient	p-Value	Lag 2 Coefficient	p-Value	Significance
Manufacturing	0.1965	0.282	-0.3485	0.088	0.4111	0.035	Lag 2 significant
Services	-0.1011	0.307	0.0030	0.978	-0.0507	0.613	Not significant
Agriculture	-0.0024	0.992	0.6889	0.032	-0.1676	0.496	Lag 1 significant

Source: Author

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.0 Overview

This chapter presents a detailed summary of the key findings, conclusions derived from the study, provides recommendations, and proposals for further research. The first section describes the results and answers the overall question regarding the influence of export composition on Kenya's economic growth, measured through GDP. The next section provides conclusions based on these results and links back to each hypothesis. The conclusion highlights the presence of statistically significant effects of total exports and sectoral exports (manufacturing and agriculture exports) on GDP growth in Kenya. The section also outlines the implications of these findings for economic policy and export diversification strategies. The recommendation section offers practical recommendations for policy and planning, while the suggestion for further research section provides the researchers' view on areas where further research on the topic can be focused.

5.1 Summary of Findings

This study investigated the influence of export composition on Kenya's Gross Domestic Product (GDP). The study used time series data for 34 years from 1990 to 2023. For the study, data were primarily sourced from the World Bank Open Data Platform but complemented and verified with data from KNBS and other credible government agencies. The rationale for using data from the World Bank Open Data Platform was due to its credibility as a source of time series data for social and econometric analysis. First, the study explored the general relations between exports and GDP. The model showed a statistically significant correlation between total exports and GDP. This implies that total exports have an influence on Kenya's

economic growth both in the short and long term. The study then explored the impact of sectoral exports on GDP. The sectoral exports explored included agriculture, manufacturing, and services. The model for sectoral exports and GDP showed a statically significant cumulative influence on GDP. However, services exports showed no influence on GDP both in the short and long term.

The analysis began with descriptive statistics to understand the underlying data characteristics. From the descriptive statistics, Kenya's GDP averaged $42.8 billion but had noticeable variation as indicated by a standard deviation of $36.3 billion. The standard deviation indicates significant economic fluctuations over the 30 years. Further, the distribution was mildly right-skewed and platykurtic, which shows occasional peaks but moderate long-term deviations. Overall, this trend is consistent with GDP data, especially for developing economies where growth is linear but may be significantly influenced by external shocks and policy shifts periodically.

Agricultural exports averaged $4.04 billion. However, the sector experienced substantial volatility as indicated by a standard deviation of $2.09 billion. The volatility in the agriculture sector can be attributed to climatic shocks, market fluctuations, and logistical issues (Alam & Myovella, 2016). These market conditions are prevalent in the Kenyan context. The variable showed a mildly skewed and platykurtic distribution, which is an indication of sporadic surges in performance. These findings align with literature documenting agriculture's vulnerability to external disruptions in Sub-Saharan Africa (Verter & Becvarova, 2016). Manufacturing exports had a mean of $1.81 billion and a median of $1.88 billion, which suggests a slight asymmetry in the distribution. The data exhibited moderate variability and a mild positive skew, with occasional high export years. This can be attributed to structural constraints, regional market conditions, and policy changes.

Services exports showed the highest mean among the three sectors at $7.02 billion and a high standard deviation of $4.06 billion. This indicated large swings in performance. The swings can be attributed to the cyclical nature of services such as tourism, ICT, transport, and financial services. These exports are known to be highly responsive to both global and domestic economic changes. For instance, tourism fluctuates significantly due to factors such as seasonality, bad reviews, and other market conditions. Regardless, the sector displayed a symmetrical and nearly normal distribution.

The next steps in the analysis were diagnostic tests for stationarity, normality, serial correlation, and cointegration to ensure model reliability. Two ARDL models were run to compare total exports and GDP, and sectoral exports and GDP for the period from 1990 to 2023. The models revealed a statistically significant influence of total exports and sectoral exports on GDP, respectively. The results generally align with the theoretical expectation. Specifically, the Export Led Growth hypothesis postulates a positive correlation between exports and GDP in general. However, the contribution of manufacturing export was positive but weak and delayed in the case of agriculture. Services exports showed no statistically significant influence on GDP growth.

The results also align with the results in other similar studies, especially in the developing world. In this case, the results can be explained by the structure of the Kenyan economy and the underlying characteristics of the sectors investigated. On the one hand, the finding that Kenya’s GDP is significantly influenced by exports is consistent with extant literature. Like most sub-Saharan African countries, the influence of Kenya’s exports on economic growth is heavily influenced by several structural and economic factors. Firstly, exports constitute a relatively small portion

of Kenya's GDP and hence limit their capacity of exports to drive overall economic growth (Majune, 2023).

Additionally, Kenya's export sectors face deep structural challenges. The manufacturing sector is import-dependent, which means that a large proportion of the gains from exports are often offset by the cost of imported inputs (Were, 2016). Similarly, the agriculture sector is vulnerable to weather shocks, pests, and price volatility (Alam & Myovella, 2016). Further, Kenya lacks robust integration into global value chains. According to Milner (2017), developing countries are often left out of global trade, which hinders the ability of their exports to contribute meaningfully to economic transformation (Milner, 2017). This may explain the delayed contribution of Agriculture to GDP. Finally, service exports are often informal, seasonal, and underreported. Such limitations impede the sectors' ability to have a measurable effect on GDP, as shown in the model.

5.2 Conclusion

This study examined the influence of Kenya's export composition on economic growth using an Autoregressive Distributed Lag (ARDL) model and annual data from 1990 to 2023. The findings reveal a nuanced picture of Kenya's export landscape and its influence on Kenya's growth. Based on the model, Manufacturing and agricultural exports have a statistically significant short-run impact on GDP, while service exports do not exhibit significant short- or long-run effects on GDP.

These results partly align with classical trade theory and the Export-Led Growth Hypothesis, but also highlight contextual limitations. In general, the models showed that exports have a statistically significant influence on Kenya's growth. However, structural weaknesses, including low value addition, limited export diversification,

and dependence on a narrow set of markets, impede the full growth potential of exports. Notably, the statistically significant effect of agricultural exports points to a critical policy implication. It suggests that agriculture should be prioritized as a strategic growth driver for Kenya. Reforms aimed at agro-processing, climate-smart farming, and rural infrastructure development could accelerate export earnings and support GDP growth in the near term (Alam & Myovella, 2016). This should be complemented by long-term investments in industrial innovation and service sector modernization.

5.3 Recommendation

Kenya needs to adopt a multifaceted policy approach to strengthen the contribution of exports to Kenya's economic growth. First, Kenya should shift focus to diversifying its export base both within individual sectors and across different international markets. This is in line with literature that shows that an overreliance on a narrow set of commodities and limited trading partners increases vulnerability to external shocks such as price volatility and global demand fluctuations (Adeniyi, 2021). To put it into perspective, the range of products and services exported and the countries to which Kenya exports such products is very limited in scope. Services sector exports are dominated by tourism and logistics, with Europe being the dominant tourism market and EAC largest logistics market. The agriculture export sector is also dominated by coffee, tea, and horticulture, which are also exported to a narrow market. Kenya can stabilize earnings and build resilience against these uncertainties by expanding its export portfolio.

In addition, there is a critical need to promote value addition, particularly in the agricultural and manufacturing sectors. Exporting raw or semi-processed goods limits Kenya's ability to capture higher-value global markets. Efforts can be targeted at

encouraging agro-processing, industrial innovation, and light manufacturing. Such a shift in focus can significantly improve export revenues while creating jobs and strengthening domestic supply chains in the short run, and lead to a significant contribution to GDP growth in the long run (Alam & Myovella, 2016).

Kenya must also focus on strengthening its macroeconomic and trade policy frameworks. Stable and predictable policies and robust institutional support are critical to improving investor confidence and may enhance the overall performance of export-oriented sectors. Streamlining regulations, reducing bureaucratic hurdles, and fostering public-private partnerships are recommended. Investment in resilience is equally important, especially within the agriculture and service sectors. Within the agriculture sector, this can be done by adopting climate-smart farming techniques and developing effective disaster risk management systems to mitigate the adverse effects of climate variability on export performance. In the services sector, particularly tourism and ICT, resilience can be achieved through infrastructure upgrade, improved digital connectivity, and consistent service quality to attract and retain foreign demand.

Finally, strengthening trade logistics, including ports, roads, customs systems, and regional trade corridors, can help reduce export costs and improve market access. Kenya is doing well within this area with significant investment in port infrastructure, road network, and regional integration within the EAC and other trade frameworks. However, a lot more need to be done to ensure that Kenya fully benefits from exports (Kalaitzi, 2018). Efficient logistics is fundamental to guaranteeing that Kenyan goods and services reach global markets competitively and on time. These measures can collectively create a more robust, resilient, and inclusive export sector that meaningfully supports long-term economic growth.

While the recommendations offer a comprehensive roadmap, greater clarity on policy prioritization would strengthen their effectiveness. In this case, agriculture should be prioritized in the immediate term as a strategic lever for economic growth. Targeted reforms such as enhancing value addition in key export crops, improving rural infrastructure, and expanding access to climate-smart farming techniques should be fast-tracked. These efforts are likely to yield quicker returns compared to the manufacturing and services sectors, which showed no statistically significant short-run impact on GDP. In the medium to long term, parallel investments in industrial innovation and service sector development can help build a balanced and resilient export-led growth trajectory.

5.4 Limitations and Suggestions for Future Research

There are several limitations arising from the structure of the study that may affect the interpretation and generalizability of the findings. One key limitation is the study is the use of GDP as the sole indicator of economic growth. In essence, GDP is a standard and widely recognized measure of economic performance. However, GDP alone does not capture all critical dimensions of development, such as employment generation, income distribution, and structural transformation. Such factors may be relevant in assessing the broader impact of export-led growth strategies, especially for Kenya. Additionally, the study period spans several major global events, which were not accounted for in the study. Great examples include the 2008 financial crisis and the COVID-19 pandemic. Their influence is likely to have distorted the relationship between exports and economic growth.

To build on the findings of this study and address its limitations, future research should focus on a few key areas. The areas herein can help generate deeper, more actionable insights into the complex relationship between Kenya’s export composition

and economic growth. Firstly, future research should consider a sector-specific assessment of the impact of global events on Kenya's export performance. Global events such as the COVID-19 pandemic and global financial crises have a huge impact on GDP growth and may affect exports from developing economies in more defining ways than they affect the developed nations (Gagnon et al., 2023). Understanding how different shocks affect export sectors can offer valuable insights for designing more responsive and adaptive trade policies.

In addition, more disaggregated analysis is recommended. This study treated agriculture, manufacturing, and services as homogeneous sectors because it was more focused on general trends and the contributions of the sectors to GDP (Kilavuz & Topcu, 2012). Future studies could delve deeper into specific sub-sectors to undertake a more in-depth analysis and provide more actionable insights. For example, distinguishing between tea and horticulture within agriculture or tourism and ICT within services can delineate the impact of lags in certain subsectors. The approach would help identify the distinct growth drivers and vulnerabilities within each sub-sector.

Another important area for future exploration is the role of bilateral and multilateral trade agreements in shaping Kenya's export trajectory and overall economic performance. Agreements such as the African Growth and Opportunity Act (AGOA) and the African Continental Free Trade Area (AfCFTA) offer unique opportunities and challenges for Kenya and may influence GDP to a larger extent (Gnangnon, 2021). Evaluating their impact over time would provide useful guidance for policymakers on how to better leverage such frameworks for sustainable growth. By addressing these areas, future research can contribute to a more granular and policy-

relevant understanding of how Kenya's export sectors can be optimized to support long-term economic development (Were, 2016).

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APPENDICES

Appendix I: NACOSTI Certification

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Appendix I: Research Gaps

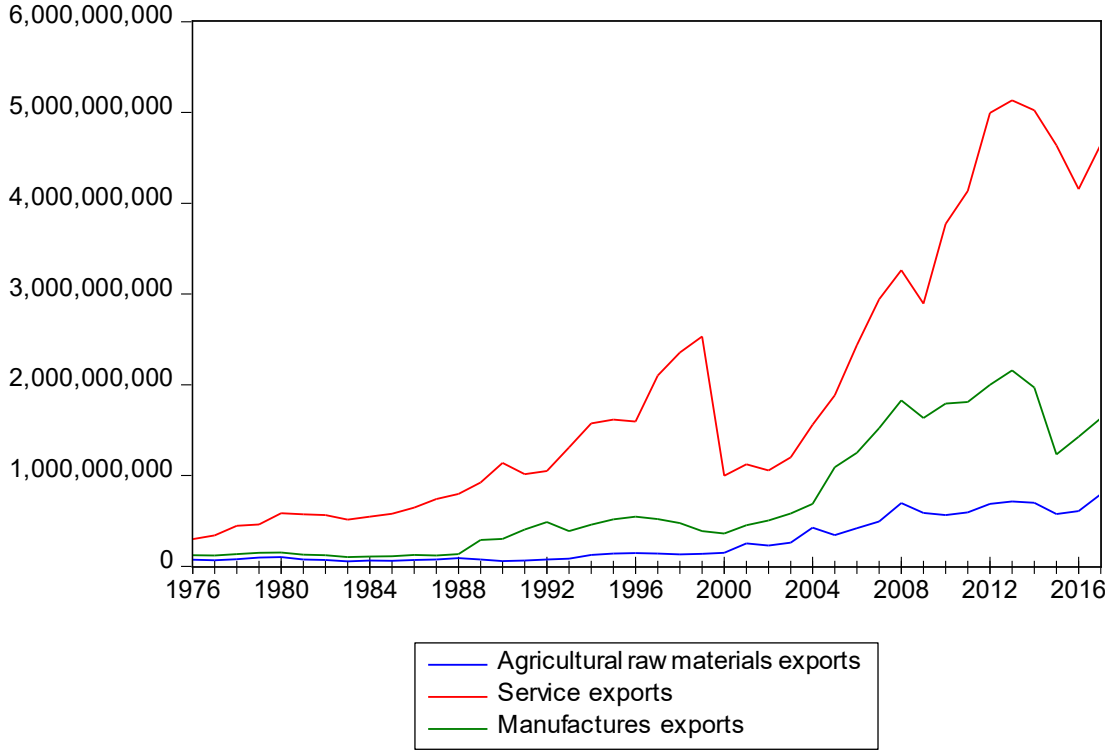
Study (Author(s), Year) & Region / Period	Export Type	Key Findings	Gaps / Limitations	Contribution / Relevance
Sultanuzzaman et al. (2019)	Manufactured	Technology and manufactured exports significantly boost growth (short & long term)	Focus on Asian economies; no representation of African/SSA context; does not cover composition beyond "exports + technology."	Provides methodological inspiration, shows the significance of manufactured exports plus technology, a useful benchmark when testing Kenya's export composition (manufactured, agricultural, services)
Kalaitzi & Chamberlain (2020) — oil-producing countries	Manufactured	Primary/fuel exports hurt growth; no causal link between fuel/mining exports and growth	Focus on fuel/mining exports; doesn't analyse manufactured exports in economies transitioning away from resource dependence — limited generalizability	Offers cautionary evidence for countries heavy in primary fuels; for Kenya (less reliant on fuel exports), underscores the importance of export diversification — supports the rationale for analysing non-primary exports
Kalaitzi & Cleeve (2018) — UAE (1980–2016)	Manufactured	Short-run bidirectional causality between primary imports and growth; transient indirect effects from manufactured exports	Observed effects are short-term and transient; long-term effects unclear; single-country, oil-rich context — low external validity for Kenya	Highlights the need for long-term analysis. Supports your use of the long-run framework (1990–2023) to capture the sustainable effects of export composition
Bbaale & Mutenyo (2011) — 35 Sub-Saharan African countries	Manufactured	Agricultural exports significantly impact growth; manufactured exports had little effect	Manufactured exports "played very little role" — but only agriculture & manufacturing considered; services ignored; no disaggregation by type of manufacturing	Shows that in the SSA context, manufacturing may have a limited effect. This sets a baseline for Kenya and motivates inclusion of services as well as fine-grained export categories
Kılavuz & Topcu (2012) — 22 developing countries (1998–2008)	high-tech manufactured goods	High-tech manufacturing exports (plus investments) positively affect growth	Only the high-tech segment is considered; it excludes low- or medium-tech manufacturing common in many African countries; short period; no services or primary exports considered	Emphasizes the role of "complex/high-tech" manufacturing, suggests that in Kenya, assessing manufacturing quality (rather than just volume) could yield important insights
Torayeh (2011) — Egypt (1980–2008)	Manufactured	Bidirectional long-run causality between manufactured exports and growth	Single-country case; specific to Egypt's industrial and export structure; may not transfer to Kenya's economy	Demonstrates that in a developing, export-oriented economy, manufactured exports can drive growth — serves as supporting evidence for your hypothesis in Kenya

Njimanted & Aquilas (2015) — Cameroon (1980–2014)	Manufactured (commodity export)	Timber exports negligible short-run effect; a positive long-run effect on growth	Focus on a single commodity; it does not represent diversified manufacturing; it may not generalize to countries with varied export baskets	Highlighting the importance of a long-run horizon when using export data reinforces your decision to cover 1990–2023, a long span, allowing structural changes and diversification
Mosikari et al. (2016) — SADC region (1980–2012)	Manufactured (regional panel)	Manufactured exports positively impact growth; causality flows from growth → exports (not vice versa)	Reverse causality suggests manufactured exports might be growth-induced, not growth-driving; region aggregates many countries, obscuring country-specific heterogeneity	Reminds you to carefully test causality direction in Kenya possibility of bidirectional dynamics or reverse causality must be managed (e.g., via ECM/ARDL + diagnostic tests)
Marconi et al. (2013) — 63 middle- and high-income countries (1990–2011), excluding major fuel exporters	Manufactured (global panel)	Manufacturing output & exports are important for productivity and development under the first two Kaldor's Laws	Excludes major fuel exporters but still largely high/middle income economies; may overstate manufacturing's role relative to lower income, developing economies	Provides theoretical justification and empirical backing for the "industrialization-export-growth" link, which you can test for Kenya, a middle-income African country subject to structural transformation
Utonga & Dimoso (2019) — Tanzania (1980–2015)	Manufactured + Mixed	Exports (aggregate) and GDP are co-integrated; a long-run link between exports and growth	Aggregates all exports; does not disaggregate by composition (manufactured, agricultural, services), lacks nuance	Illustrates that aggregate export–growth links exist in East Africa, but points to the need for a deeper decomposition of export composition in your Kenya study
Bhorat et al. (2016) — Africa	Exports Composition	Export portfolios are largely peripheral (primary products), with low productive capabilities; manufacturing is weak, and limited structural transformation	Uses a broader "economic complexity" framework, but is general across Africa, lacks country-specific focus; does not examine growth outcomes with econometric rigour	Underscores structural constraint in many African economies supports your study's focus on composition (not just volume), and justifies the investigation of whether Kenya has shifted towards more complex/valuable exports over 1990–2023
Izuchukwu (2011) Nigeria (1987–2007)	Agricultural	Agricultural output, domestic savings, government agricultural spending, and FDI are positively associated with GDP	Nigeria-specific; doesn't consider export structure, or differentiate between agricultural, manufactured, services exports; short–medium term	Offers a benchmark for agriculture's role, reminding you to include the agricultural export share as a separate variable for Kenya and control for domestic agriculture factors
Olajide et al. (2012a) — Nigeria (1970–2010)	Agricultural	Positive causal link between agricultural output and GDP	Focus on domestic agricultural output, not necessarily exports; excludes the manufactured and services sectors	Suggests that even without export orientation, agriculture contributes, but for Kenya, export composition may matter, verifying if export-driven growth follows similar patterns

Ojo et al. (2014) — Nigeria (1982–2012)	Agricultural	Agricultural exports (and other factors) affect long-term growth	Single-country; commodity-focused; no breakdown by type of agriculture; limited external validity	Reinforces the importance of including agricultural exports in the Kenya model, but also the need for commodity-level or sub-sector analysis if data permit
Sanjuán-López & Dawson (2010) — 42 developing countries	Agricultural (panel)	Agricultural exports have a long-run positive relation with GDP (elasticity ~ 0.07); non-agricultural exports higher elasticity (0.13)	Aggregates many countries; elasticity is small; no analysis by export composition beyond "agricultural vs non-agricultural."	Supports export-led growth hypothesis globally, but low elasticity suggests that in Kenya, the impact of agriculture might be modest, motivating inclusion of non-agricultural exports (manufactured + services) in the composite model
Alam & Myovella (2016) — Tanzania (1980–2010)	Agricultural	Long-run causality from agricultural exports → GDP	Tanzania-specific; excludes other export types; ignores structural changes over time (e.g., services, manufacturing growth)	Provides East Africa precedent relevant for Kenya, but points to the limitation of focusing only on agriculture; justifies a broader composition approach
Uremadu & Onyele (2016) — Nigeria (1980–2014)	Mixed Agriculture Commodities	Aggregate agricultural exports positively influence GDP; mixed results for specific crops (cocoa positive but insignificant; rubber negative)	Variation across commodities; results not robust across all products; context-specific	Suggests that export composition even within agriculture matters for Kenya, if data permit, disaggregation (e.g., tea, coffee, horticulture) could reveal differential impacts
Edeme et al. (2016) — 15 ECOWAS countries (1980–2013)	Regional Panel (ECOWAS)	Agricultural exports had a smaller but still "considerable" impact on GDP; the effect varied across countries	No uniform effect; country heterogeneity; no services or manufacturing exports considered	Demonstrates need for country-specific analysis and inclusion of all major export types supports your decision to use Kenya panel data across 1990–2023
Singh (2012) — India (1950s–2000s)	Services	The services sector's share in GDP rose significantly; service exports contributed to growth	Descriptive study, no rigorous econometric analysis; single country; long period, structural changes not accounted for	Motivates inclusion of services sector (and services exports) in your Kenya model especially as Kenya's economy has evolved and diversified over 1990–2023
Hanson et al. (2019) — Mauritius	Services	Strong long-term link between services exports (especially business, insurance, pension) and GDP per capita; bidirectional causality for some subsectors	Small island economy: services mix very different from Kenya (e.g., financial, pension services)	Provides empirical evidence from Africa that services exports matter, supports the hypothesis that Kenya's growing services exports may drive growth
Priyankara (2018) — Sri Lanka	Services	Negative shocks in services exports have a larger	Country-specific; structural context differs; may not generalize	Suggests that in Kenya, shocks to services exports (e.g., tourism, transport, ICT) could

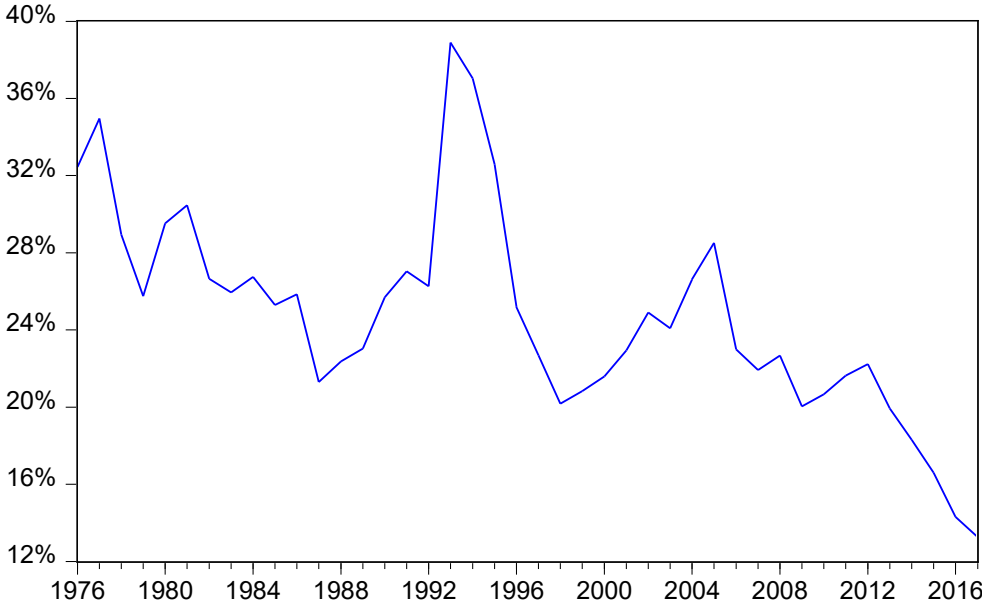
		detrimental impact on growth than positive shocks help growth (asymmetric effects)		have large welfare consequences useful for policy implications and robustness checks
Liew et al. (2012) — Tanzania (1980–2009)	Services	Long-run link between services exports and growth; growth drives services exports (unidirectional)	Goods exports ignored; causality seems reversed (growth → exports), so services may be the effect, not driver	Signals that econometric modelling for Kenya should carefully test causality direction (use ECM/ARDL, co-integration, Granger causality) rather than assume export → growth
Mattoo (2006) — 60 countries (1990–1999)	Services (cross-country)	Liberalization of services (finance, telecom) is associated with higher growth rates (up to 1.5% faster)	Data old; limited to telecom/finance; doesn't consider many modern or diverse services; short time span	Suggests liberalization/policy environment matters — for Kenya, historical structural reforms (post-1990) may influence how services exports affect growth — supports inclusion of institutional/control variables
Spatafora et al. (2012) — 103 countries (1990–2007)	Services Quality & Complexity	Quality and "income-level" of service exports (via PRODY/EXPY) strongly correlated with growth, beyond just volume	Highly aggregated, complex methodology; varying service definitions; may not align with Kenya's service composition (e.g., tourism, transport, ICT, remittances)	Introduces the idea that not all service exports are equal for Kenya; if data allow, service export quality/complexity should be accounted for, not only volumes
Philip & Adeyemi (2013b) — 33 SSA countries (1990–2010)	Services & Trade in SSA	Service exports and imports, capital, and labour are positively associated with growth in fixed/random effects models	Regional aggregate masks country-level heterogeneity; limited granularity on service sub-sectors	Reinforces the need for country-specific, disaggregated analysis, supports your design focusing on Kenya (not the regional panel) and decomposing export composition by sector

Appendix III: Export composition



Source of Data: World Bank (2018)

Appendix IV: Exports of goods and services (% of GDP) in Kenya



Source of Data: World Bank (2018)

Appendix V: GDP Unit Root Test

Null Hypothesis: GDP has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.920003	0.9997
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GDP_CURRENT)

Method: Least Squares

Date: 05/22/25 Time: 05:18

Sample (adjusted): 1991 2023

Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP_CURRENT (-1)	0.034859	0.018156	1.920003	0.0641
C	1591.643	969.7777	1.641246	0.1109

R-squared	0.106278	Mean dependent var	3014.128
Adjusted R-squared	0.077449	S.D. dependent var	3742.544
S.E. of regression	3594.696	Akaike info criterion	19.27100
Sum squared resid	4.01E+08	Schwarz criterion	19.36170
Log likelihood	-315.9715	Hannan-Quinn criter.	19.30152
F-statistic	3.686411	Durbin-Watson stat	1.291697
Prob(F-statistic)	0.064100		

Appendix VI: ARDL Results Summary

Variable	Coefficient	Std. Error	t-Statistic	p-Value
ΔGDP (t−1)	0.7011	0.2131	3.29	0.004
ΔManufactured	0.1965	0.1778	1.11	0.282
ΔManufactured (t−1)	−0.3485	0.1946	−1.79	0.088
ΔServices	−0.1011	0.0965	−1.05	0.307
ΔServices (t−1)	0.0030	0.1058	0.03	0.978
ΔAgriculture	−0.0024	0.2287	−0.01	0.992
ΔAgriculture (t−1)	0.6889	0.2998	2.30	0.032
Constant	−0.9221	0.4728	−1.95	0.065

Appendix VII: Data Used

Year	GDP	Services Exports	Manufacturing Exports	Agricultural Exports	Total Exports
1990	8572.359	2397	498.9784	1066.313	3962.291
1991	8151.489	2177	514.6318	1209.615	3901.247
1992	8209.121	2216	713.7473	1242	4171.747
1993	5751.787	2722	607.5741	1532	4861.574
1994	7148.149	3353	617.3384	1925	5895.338
1995	9046.32	3363	733.4092	2211.311	6307.72
1996	12045.87	3310	795.4069	2439.225	6544.632
1997	13115.76	4733	813.0111	2358.822	7904.833
1998	14094	5444	741.5434	2416.351	8601.894
1999	12896.01	5952	623.024	2105.524	8680.548
2000	12705.35	2071	590.4865	2085.29	4746.776
2001	12986.01	2392	802.1051	2256.536	5450.641
2002	13147.74	2196	1009.25	2183	5388.25
2003	14904.52	2490	1190.23	2314.224	5994.453
2004	16095.34	3509	1562.949	2778.611	7850.56
2005	18737.9	4696	1849.748	2916.433	9462.18
2006	25825.51	5849	1670.568	3402.14	10921.71
2007	31958.2	6981	1904.862	3976	12861.86
2008	35895.15	8154	2415.113	4946.708	15515.82
2009	42347.22	7361	1987.709	4487.298	13836.01
2010	45405.62	8991	2164.888	5284.701	16440.59
2011	46869.47	9875	2475	5631	17981
2012	56396.7	11763	2612	5826	20201
2013	61671.44	10203	2648.169	5820.504	18671.67
2014	68285.8	10490	2892	5512	18894
2015	70120.45	9638	2957.402	5749	18344.4
2016	74815.14	9710	2703.691	5781	18194.69
2017	82036.51	10496	2572.243	6418.717	19486.96
2018	92202.98	12197	2832.839	6667.738	21697.58
2019	100378.4	12976	2830.84	5833.948	21640.79
2020	100657.5	9296	2710.099	6525.398	18531.5
2021	109703.7	12034	3255.451	7112.058	22401.51
2022	114449	14663	3741.659	7706.506	26111.17
2023	108038.6	15064	3446.869	7582.192	26093.06

Appendix III: Granger causality Wald tests

Equation (Dependent Variable)	Excluded Variable(s)	Chi2	df	Prob > Chi2
dgdp	dman_exp	0.54443	1	0.461
dgdp	dserv_exp	1.1146	1	0.291
dgdp	dagr_exp	1.7469	1	0.186
dgdp	ALL	5.5305	3	0.137
dman_exp	dgdp	0.68004	1	0.410
dman_exp	dserv_exp	1.0751	1	0.300
dman_exp	dagr_exp	0.66896	1	0.413
dman_exp	ALL	3.2635	3	0.353
dserv_exp	dgdp	0.00085	1	0.977
dserv_exp	dman_exp	2.8645	1	0.091
dserv_exp	dagr_exp	0.00151	1	0.969
dserv_exp	ALL	3.0249	3	0.388
dagr_exp	dgdp	2.0488	1	0.152
dagr_exp	dman_exp	1.0086	1	0.315
dagr_exp	dserv_exp	0.01383	1	0.906
dagr_exp	ALL	2.7063	3	0.439

Appendix IX: Plagiarism Awareness Certificate

SR871

ISO 9001:2019 Certified Institution

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