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EVALUATING THE INFLUENCE OF WOOL, COTTON AND FISH EXPORTS ON ECONOMIC GROWTH IN LESOTHO

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WITS Business School

Research Article

Thesis presented in partial fulfilment for the degree of Master of Business Administration to the Faculty of Commerce, Law, and Management, University of the Witwatersrand

March 2021

DECLARATION

I Thato Mokhothu-Ramohlanka declare that this research report entitled 'Evaluating the influence of wool, cotton and fish on the economic growth in Lesotho' is my own unaided work. I have acknowledged, attributed, and referenced all ideas sourced elsewhere. I am hereby submitting it in partial fulfilment of the requirements of the degree of Master of Business Administration at the University of the Witwatersrand, Johannesburg. I have not submitted this report before for any other degree or examination to any other institution.

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ABSTRACT

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Thesis title: **Evaluating the influence of wool, cotton and fish exports on economic growth in Lesotho**

This study aims to evaluate the influence of wool, fish, and cotton on the economic growth in Lesotho, analysing a 30-year period from 1990 to 2020. The paper provides an analysis of the long-term and short-term relationships between wool, cotton, fish and economic growth, and their causal effects on economic growth. The study used the Augmented Dickey-Fuller and the Phillips Perron unit root tests to determine whether the data set is stationary. The Johansen co-integration model identified the existence of long-run relationships. The error correction model and the Granger causality test determined the short run and causal relationships, respectively. Findings indicate that wool and cotton have a positive and significant influence on economic growth. In contrast, fish has a negative influence both in the long and short run. In addition, the study found unidirectional causation between economic growth and wool exports, bidirectional causality between cotton exports and economic growth, and unidirectional causation between economic growth and fish exports. Finally, to improve the benefits of the agricultural sector in Lesotho, there is a need for policy reform around structural changes to diversify exports and exports markets.

Johannesburg, March 2021

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ABBREVIATIONS

AFCFTA	African Continental Free Trade Area
AGOA	African Growth and Opportunity Act
AU	African Union
CGE	Computable General Equilibrium
LDC	Least Developed Countries
REC	Regional Economic Communities
SACU	Southern African Customs Union
SSA	Sub Saharan Africa
UNDP	United Nations Development Programme
VAR	Vector Auto regression
VECM	Vector Error Correction Model

1 INTRODUCTION TO THE RESEARCH

1.1 Background and Context

Approximately 77 per cent of Lesotho's total population lives in rural areas and uses the land for subsistence farming (National Medium Term Investment Programme, 2005). Lesotho's socio-economic challenges, including poverty, high youth unemployment, HIV/AIDS and high mortality rates, contribute to its low ranking on the human development index. In 2018, Lesotho ranked 164 out of 189 countries with a score of 0.518 (UNDP, 2018). A combined strategy comprising robust manufacturing, industry and agricultural production and increased exports is imperative for the economic growth prospects of Lesotho.

These economic challenges are common across the African continent. According to Bakari and Mohamed (2018), average growth in Africa between 1996 and 2000 was 3.53 per cent compared to 3.2 per cent in South and Central America, 3.34 per cent in Asia and 3.46 per cent in the rest of the world. This significantly improved from 2001 to 2005 and 2006 to 2010, the average growth was 5.49 per cent and 5.05 per cent, compared to 2.91 per cent and 2.27 per cent in the rest of the world, respectively. Trade in Africa is insufficient, and poverty and unemployment remain high. World Bank data (2017) indicates that half of the world's poorest people live in sub-Saharan Africa (SSA), where approximately 400 million people live on less than US$1.90 per day.

There has been widespread analysis of the case of China to determine the factors that can be emulated to improve Africa's challenges. China has followed both a domestic led and export led growth strategy. A cross-sectional study determining factors of economic growth in China compared to North and SSA showed that the main impediment to Africa benefiting from trade is that, unlike China, Africa imports more than it exports (Anyanwu, 2014). This indicates that domestic demand is critical in enhancing economic growth as it increases productivity. The research examined the factors that led to China's economic growth vis-à-vis North and SSA countries using cross-sectional data between 1996 and 2010 for Africa and 1980 and 2010 for China. The findings suggest that the structure of African exports is based on primary commodities, while China's strategy has shifted towards robust manufacturing. More focus on manufacturing would increase capital investments that can bolster productivity in Africa.

There is a glaring need for more studies focused explicitly on the impact of agricultural trade on economic growth in Lesotho to prevent misdirection of investments in an economy that cannot afford wasteful expenditure. Currently, exports are highly concentrated in the

manufacturing of textiles and apparel sector, which became successful following the 2000 AGOA-led textile and apparel exports unilateral agreement in the Southern African region. In 2001-2003 the exports of textiles and garments stimulated economic growth in the country, which attracted foreign direct investment in the sector and led to an increase in private investment from 8 per cent of GDP in 1991 to 21 per cent of GDP in 2003 (NMTIP, 2005). Edwards and Lawrence (2009) write that in 2008, Lesotho exported close to $350 million in apparel to the United States, amounting to 29 per cent of total apparel exports from SSA. The number declined substantially from its peak in 2004, but the country still exports more apparel than Madagascar and Kenya— two of its closest competitors in the sector.

The lack of diversification in exports leaves Lesotho vulnerable should AGOA phase out. Exports of textiles and apparel constitute more than 60 per cent of total exports, and agro-exports accounted for only 4.38 per cent of GDP in 2019 (World Bank, 2020). Other significant exports are water driven by the Lesotho Highlights Water Project (LHWP), diamonds, electricity and wool. There is a gap in literature on exports in Lesotho. Studies in this field would contribute to highlighting the bottlenecks that exist within the agrarian sector and improving agricultural exports.

The diversity of the African continent and intra-Africa trade is an opportunity for Lesotho to increase its exports and diversify its products, but these need to be supported by the right policies. Malefane and Odhiabmbo (2019) analysed the trade policies that influence Lesotho's economic growth and found that trade openness does not have a significant impact on economic growth in the short and long run. The study used Autoregressive distributed lag (ARDL) modelling on data from 1979 to 2013. The results suggest that while trade openness has a positive impact on other economies, this is not the case for Lesotho partly due to the high imports that emanate from the SACU agreement. The policy recommendations are increasing exports, improving industrial capacity, enhancing human capacity and infrastructural development. These findings are consistent with the earlier study by Anyanwu (2014), which did not find a link between trade openness and economic growth in Africa.

1.1.1 Agricultural Exports and Economic growth in Lesotho

Diao and Hazell (2004) stipulate that African agricultural exports decreased significantly from approximately 6 per cent in the 1970s to 3 per cent in 2004. The reliance on traditional agro-exports such as coffee, cotton, cocoa, tea, sugar and tobacco has been negatively impacted

by world prices and world demand, and increased competition from Asia and Latin America. Investments in the agricultural sector have helped farmers to compete in the global market through exports. However, persisting challenges are low productivity and the inability to maintain high quality in the agricultural export markets in SSA.

Nseera (2014) identified agriculture as an important sector for the rapid growth of Lesotho's economy due to its high backwards and forwards linkages, which result in wider distribution of household incomes and reduced inequality. The benefits of agriculture can be realised by increasing the sector's productivity and raising its share in the national budget. Due to the high impact of agriculture on value-added, investment in the industry can spearhead economic growth and support the necessary shift toward industrialisation.

Small holder farmers dominate the agricultural sector in Lesotho: 85 per cent of the population is involved in crop, livestock and fisheries farming, mostly for household consumption. Small-sized farms are, however, not unique to Lesotho and should not be a deterrent to productivity. Dercon and Gollin (2014) illustrate that while most farms in SSA are small in size (less than 5 hectares), evidence from many highly productive Asian countries shows that small size is not a determinant of productivity. The micro and aggregate data suggests that agricultural output per worker in sub-Saharan economies is very low.

While agriculture is a primary source of income and livelihood for most of Lesotho's rural population, the sector has experienced increased challenges that have hindered growth over the last few years. These include poor weather conditions, a lack of infrastructure such as roads, inadequate water and irrigation management, and poor soil conditions (National Medium Term Investment Programme, 2005). Maize, wheat, sorghum, peas and beans are the main crops for produce in Lesotho, and the commercialization of the sector focuses on wool, cereals, fish and cotton agricultural exports. Other crops include sunflower, asparagus, paprika, garlic and soya beans, and vegetables and fruits grown at a small scale and not adequately marketed. Yields for these crops are meagre, usually < 1.4 tons per hectare for most cereals (National Medium Term Investment Programme, 2005).

Wool, cotton and fisheries constituted the majority of agricultural exports in 2017 in Lesotho. The export values of these products were $US37.95M, $US30.83 and $US3.83M respectively (Trading Economics, 2020). Coffee, tea, oilseed and other fruits had less than $US2M in the same year. Compared to the highest valued exports of apparel and electrical equipment categories valued at $US269.50M and $US50.54M, agricultural exports have very low export values and volumes. Low agricultural productivity is a problem particularly with the

commercialized products because of low return on investment and loss of government expenditure.

The lack of technological advancements in the sector has also contributed to the low productivity and yields. Akintunde and Oladele (2019) conducted a study to assess the use of information communication technologies (ICT) among agricultural extension officers in Lesotho. The study found poor use of ICT tools, a condition that hinders the management and dissemination of critical information to farmers regarding new technologies, techniques on preserving farm produce and timing for planting crops. Use of ICT would make a significant difference as most farms in the country are scattered in remote areas that are not easily accessible for in-person information dissemination.

Mofuoa (2015) takes on a philosophical approach to the agricultural sector in Lesotho, arguing the need for certain principles and strategies to be adopted for the country to regain its status as a highly industrious country that exported 20 000 to 40 000 tons of grain in the 19th century. The paper argues that much of the sector's success and profitability was embedded in socio-ethical values such as unity and strong work ethic. The author proposes implementing strategies to seize global agricultural market opportunities that can spearhead economic growth, including changing attitudes towards agriculture, creating social support infrastructure, building conflict management and resolution mechanisms, and promoting ethical leadership.

1.2 Research Conceptualisation

1.2.1 The Research Problem Statement

Diao and Hazell (2004) determined that low productivity and the inability to maintain high quality are the main challenges associated with the agricultural export markets in SSA. Poor quality pertains to the wool from Lesotho while low productivity is linked to the fish exports. Policies that are focused on increasing the domestic demand of these commodities is necessary to increase investments and consumption. A clear strategy that is aimed at increasing productivity can redirect government consumption and investments in sectors that can have the most effects on the economy. The agricultural exports strategy in Lesotho has been primarily export-led. This strategy can be beneficial, however, a more demand-led strategy allows productivity to increase in order to service both the local and international markets, while also ensuring that there is sufficient consumption to sustain the economy during global market shocks.

Wool, cotton and fisheries constituted the majority of agricultural exports in 2017 in Lesotho. The export values of these products were $US37.95M, $US30.83 and $US3.83M respectively (Trading Economics, 2020). Compared to the highest valued exports of apparel and electrical equipment categories valued at $US269.50M and $US50.54M, agricultural exports have very low export values and volumes. The economic growth in China has been driven by a more open economy has created a market that allows for the importation of consumer goods as well as quality goods that are added to the production of domestic products therefore stimulating domestic competition and productivity (Tsen, 2010).

Factors such as the high unemployment rate in Lesotho impact negatively on the private consumption and thus hindering economic growth. This has led to a narrow tax base and an increased propensity to save amongst consumers. A focus on increasing the disposable income of workers and having a broader tax base through the inclusion of more people into the job market are recommended for the Government of Lesotho (Damane, 2018). This will result in having a well-informed strategy that can increase productivity to affect domestic demand while also improving exports in the country.

An application of administrative management theory to redesign the ministries of planning and trade to include a department that specifically focuses on strategies to increase productivity is necessary. McKinsey's 7S model must be applied to ensure that there is alignment between the structure, systems, strategy, shared values, style, staff and skills in both the departments. Failure to do so will encourage a continuation of slow execution of the strategy due to the disjoined work between the departments as well as unqualified and ill performing staff members.

1.2.2 The Research Purpose (aim and objectives) Statement

This study evaluates agricultural exports in Lesotho in relation to wool, cotton and fish, using econometrics techniques to assess data from agricultural exports and economic growth in Lesotho.

The objectives of the study are as follows:

I. To assess the trend of agricultural exports over time
II. To evaluate the influence of wool exports on economic growth
III. To evaluate the influence of cotton exports on economic growth
IV. To evaluate the influence of fish exports on economic growth

V. To determine the influence of gross fixed capital formation, government consumption expenditure and consumer price index on economic growth in Lesotho

VI. To determine whether there is an existence of long run causality between agricultural exports and economic growth using the Granger causality test

1.2.3 The Research questions

I. What is the trend of agricultural exports in Lesotho?

II. What is the influence of wool exports on economic growth in Lesotho?

III. What is the influence of cotton exports on economic growth in Lesotho?

IV. What is the influence of fish exports on economic growth in Lesotho?

V. What is the influence of gross fixed capital formation, government consumption expenditure and consumer price index on economic growth in Lesotho?

VI. Do agricultural exports Granger cause economic growth in Lesotho?

1.3 Delimitations and Assumptions of the Research Study

The research will use secondary data on the export values of three commodities—wool, cotton and fish—for a 30-year period from 1990 to 2000. This data will evaluate the effect of these commodities on the economic growth of Lesotho against GDP data over the same period. Due to the scarcity and unavailability of data over the entire period, some data points were deemed to be 0. Lesotho exports many agricultural and non-agricultural products, but the study is restricted to wool, cotton and fish as they are the main commercialized agricultural exports. The study does not assess the effects of other commodities, and the results can, therefore, not be generalized to the entire Lesotho export market.

1.4 Significance of the research study

There is a need to understand how exports affect the economy, to foster growth and reduce unemployment. The available studies on the export-growth nexus that use cross section samples overlook the heterogeneous nature of African countries and can lead to inaccurate results (Furuoka, 2018). Assessing the export-growth nexus for individual countries using time-

series data using 20-30 years of annual data with the same variables used in cross-country studies can eliminate the parametric variations across countries (Ram, 1987). Therefore the country-specific analysis of the export-led growth hypothesis is an essential motivation of this study.

This paper will be a valuable source of information for policy makers. As many countries worldwide face economic challenges and as Lesotho undergoes a process of reforms in many sectors of the economy, empirical research is critical to provide all stakeholders with the necessary information for improved decision making. The study will also provide valuable knowledge on the diversification of exports and export markets to provide support to inform reforms and strategies and create an environment conducive for investment.

1.5 Preface to the Research Report

The subject matter of this study, specifically the relationship between exports and economic growth, has been vastly researched since the export-led growth hypothesis gained popularity in the 1970s. This is a pertinent research study as developing countries struggle to find economic models that can quickly and significantly develop their economies for the creation of employment and poverty reduction. The following chapters of the research will be the literature review; research design, procedure and methods; presentation of research results; discussion of research findings, summary, conclusions, limitations, and recommendations.

There is a plethora of literature that attempts to show the link between exports and economic growth. Emery (1967) highlights the benefits of high exports, including the efficacy of industry, channeling investments towards high-profit sectors, and comparative advantage. The common method that studies use to test the relationship between exports and economic growth has been the Granger causality test on export data over a period of time. For example, Jung and Marshall (1985) used the Granger causality test on 37 countries but only found evidence that supported the link between increased exports and economic growth in four countries. The study suggested that the support of the export sector cannot be unanimous.

The mixed results highlight the importance of adopting unique strategies and models beneficial for a particular region or country. Agricultural exports, in particular, have the potential to lead to economic growth for developing countries. However, policy makers should assess this holistically by determining whether the export of raw materials such as in the agricultural sector accrues export revenues that support a particular country's economic growth objectives. For

example, Morris and Fessehaie (2014) show that more revenues can be accrued, and employment creation stimulated through forward linkages and manufacturing of the commodities sector.

This study evaluates the impact of agricultural exports on the economic growth of Lesotho, focusing on the following commodities: wool, cotton and fish which are the most significant agricultural exports from the country, respectively. Textile manufacturing is the highest export product in Lesotho, constituting 66 per cent of total exports with an export value of $269.50M in 2017 (Trading Economics, 2020). Multiple studies have been conducted on the impact of the textile sector on economic growth, yet there is a lack of empirical research on agricultural exports. This study will contribute to the existing knowledge gap.

This study's objectives will be achieved by assessing official data published annually on the export values of wool, cotton, and fish from 1990 to 2020. The statistics repositories consulted for this data are the Central Bank of Lesotho, the Lesotho Bureau of Statistics and Trading Economics. These will be tested using descriptive statistics and time series techniques.

2 LITERATURE REVIEW

This chapter will outline the different views, literature and empirical evidence from scholars on agriculture and economic growth, which inform the agricultural sector in Lesotho's economy. The first section provides the theoretical framework highlighting trade theories and the role of exports on economic growth. This will be followed by an overview of empirical studies on the relationship between exports and economic growth. These studies are divided into regression and correlation techniques as well as those that used time-series approach. Next will be an outline of export-led growth studies conducted in different parts of the world: Africa, Asia and the rest of the world. The second section gives an overview of agricultural exports followed by studies focusing on the relationship between agricultural exports and economic growth. Finally, the third section outlines Trade in Africa.

2.1 Theoretical Framework

The beginnings of the theories on international trade emanate from the classical theories of Adam Smith (1776) and David Ricardo (1951). Adam smith believed that output was dependent on the inputs of labour, capital and land. Smith's idea was that effective competition between countries could be achieved through the division of labour which lowered labour costs. The role of other economic factors such as technology and political stability are also emphasized. Ricardo was influenced by Smith in his work on free trade and formulated the theory of comparative advantage. According to this theory trade is beneficial as it allowed for specialization in countries on goods in which they had comparative advantage based on labour hours per output.

Exports play a pivotal role in increasing productivity through economies of scale and the access of international markets. The global market allows consumers to get access to better prices at better quality, and has the advantage of the reduction of the cost of production by importing goods that would otherwise be too expensive to produce locally.

Trade therefore becomes a necessity to create a country's comparative advantage and specialization (Emery, 1967). According to Fosu (1990), there are four primary benefits for high export levels. Increased exports offset import levels that also contribute towards economic growth and industry efficiency. These include capital goods, international exchange of labour, and discounted goods required in production factors. Secondly, the increased development of exports increases productivity by channeling investment towards the sectors of the economy that have a

comparative advantage and are efficient enough to create product specialization. Thirdly, there are gains from the economies of scale due to larger-scale operations that serve the international market. Finally, international competition puts pressure on export industries to maintain lower costs and increase efficiency, improving the quality of the product. The secondary benefits include foreign direct investment, consumption and the flow of technology.

However, the threats of external global shocks are cited as some of the disadvantages of countries having outward focused growth strategies, where recessions in some parts of the world affect export dependent markets in other parts of the world.

Palley (2002) argues that while exports are important in the economic growth of a country, they should not take away from the growth and development of the domestic market. The author adds that other problems associated with exports include creating financial instability through overinvestment booms, conflict between workers in developing and developed countries as well as the deterioration in terms of trade in developing countries due to a focus on global markets.

Economists whose arguments centre on the conflicts created by export-led strategies emanate from the theories of neo-Marxist or leftist theorists who argue that trade between less-developed and industrialized countries creates an environment for the exploitation of the poorer countries, primarily when trade emanates from the former to the latter. For example, Adelman (1984) argues that exports in developing countries hinder the industrialization process. He advocates against the export-led growth model that emphasizes import substitution particularly for developing countries and instead emphasizes the need for the agricultural-demand-led-industrialization, which positions agriculture as the primary sector in the economy in developing countries to enable industrialization.

2.2 Overview of Exports and Economic growth

The wealth of research on the relationship between exports and economic growth indicates how important it is for policy decisions to be based on empirical research to increase productivity, enhance economic growth and reduce unemployment. Since export-led growth hypothesis became a subject of study and interest, various research efforts have resulted in different views and conclusions about the impact of exports on economic growth. While some researchers agree that there is a relationship between exports and economic growth, others have not found support for the export-led growth nexus.

Theories on the relationship between exports and economic growth gained popularity in the 1970s. Particularly for the "Asian Tigers" (South Korea, Hong Kong, Taiwan and Singapore), the successes of export intensive Asian countries have also had a significant role in contributing towards the proliferation of research in the area and the amplified interest in pursuing export promotion strategies. It is crucial to note, however, the limited support for the effect of exports on economic growth from studies focusing on the African context (Furuoka, 2018).

This section examines the history and evolution of export-led growth studies from the 1970s to current years. Earlier studies of the export-led growth hypothesis were predominantly cross-sectional, using correlation and regression techniques (Michaely, (1977); Balassa, (1985); Fosu (1990)). The results of these studies mainly showed a positive effect between exports and economic growth. A new wave of researchers followed this era and analyzed the Export-led growth (ELG) hypothesis using time series methods of causality between exports and economic growth, employing mainly the Granger causality tests (Feder, (1983); Chow, (1987); Jung and Marshall, (1985); Ahmed and Kwan, (1991)). The following section outlines the studies and discusses the results—which were mixed—in further detail.

2.2.1 Historical Overview of Correlation and Regression Techniques

Michaely (1977) analyzed the relationship between exports and economic growth using correlation methods and regression on 41 countries from the period of 1950 to 1973. The results showed a positive association with growth and increased exports, as did the analysis of Balassa (1985). Balassa examined the relationship between exports and economic growth in 43 developing countries using data from the 1973-79 period associated with oil supply external shocks. The results showed the factors that influence economic growth as: investment rates, the growth rate of the labour force, initial trade policy stance and the adjustment policies applied, and the level of economic development and the composition of export products, and emphasized the importance of adopting the right policies in developing countries. Further, the study showed that an outward-oriented policy and export promotion led to accelerated growth during this period. The adaptation of modern technology and a reliance on manufactured exports have shown to have a positive impact on economic growth in developing countries.

Fosu (1990) explored the relationship between exports and economic growth on 28 African countries using a pooled cross-sectional regression cum time-series estimation of average annual growth rates from 1960-70 and 1970-80. The study employed a standard augmented

production function. The results revealed that exports had a positive effect on economic growth, but the effect was more negligible in African countries than non-African Least Developed Countries (LDCs). The result was, however, not statistically different. The study concluded that notwithstanding the reliance of African countries on agricultural exports, both regions would benefit from employing policies on enhancing economic growth through the promotion of exports.

2.2.2 Historical overview of the time series approach

Ram (1987) conducted a study that examined the relationship between exports and economic growth using indicated estimates of two models using annual time series data in 88 LDCs from 1960-82. The first model is an aggregate production function and the second is a framework derived from work by Feder (1983). The framework postulates the differences of labour and capital inputs that exist in the export and non-export sectors of the economy. The study also reported cross-section estimates of the models for 1960-72 and 1973-82 in LDC subgroups. The estimates were obtained using Ordinary Least Squares (OLS) method. The results of the study showed that the role of exports in economic growth is positive in the majority of the cases.

Chow (1987) studied the causal relationship between export growth and industrial development in eight Newly Industrialized Countries (NICs) using Sims' causality test. The findings showed a causal relationship in seven out of the eight countries, with unidirectional causality in one country, bidirectional causality in six countries and no causal link in one country. The study concluded that export-led growth strategies promote economic growth and also enable structural transformation in developing countries. The study further indicated that LDCs must explore strategies that consider demand side and supply side effects, especially for those countries targeting Asian non-industrialized countries to mitigate external shocks. The study's policy implications are that trade policies and strategies need to be adopted based on thorough research that is region- or country-specific to identify relevant export constraints and remedies that improve productivity.

Jung and Marshall (1985) researched the relationship between exports and economic growth using a comparison of time series data in 37 countries. They conducted Granger causality tests to determine the causal relationship between the variables. The findings indicate that only four countries, Egypt, Ecuador, Indonesia and Costa Rica, provided evidence of unidirectional causation in support of the ELG hypothesis. Additionally, they found unidirectional causation

running from growth to exports in three countries, Kenya, Thailand and Iran. The study did not find evidence in support of causality in the rest of the countries.

2.2.3 Limitations of Existing Research Methodologies

Giles and Williams (2010) criticize studies using cross-section techniques. The authors disapprove of correlation techniques because of the use of exports and growth as the only variables. While these studies mostly reported positive relationships between exports and growth, the models were erroneous as they incorporated export data that often included the data of the total national product. This phenomenon is known as "accounting identity" and led to more researchers opting to use alternative variables or output data that is net of exports. Since the model did not consider the relationships with other economic variables, scholars began to use the estimate aggregate production function in cross-section studies through regression applications. The regression approach assumes that the production of exports and non-exports has the same relative efficiency regardless and does not take into account the size of the domestic market. In addition, it does not consider the diminishing returns to an increasing export share.

On the other hand, Ahmed and Kwan (1991) argue that the causation methods attracted researchers because of the ability to determine reverse causation or the bidirectional relationship between exports and economic growth, while regression models are limited as they cannot determine the direction of the relationship. However, they stipulate that the Granger causality test has its flaws and that the model remains to be developed. This is because the independent factors or variables that typically led to a relationship between exports and economic growth in earlier regression models do not exist in recent causality tests due to the omitted variables, which leads to incomplete specifications.

2.3 Export-led growth studies in Africa

Njikam (2003) studied the relationship between exports and economic growth by examining the causal relationship between exports and economic growth in the agricultural and manufacturing sectors of 21 SSA countries. Using Hsiao's Granger-Causality method, the study determined the direction of the causation where a relationship exists and questioned whether the direction is reversed in countries that changed from import-substitution (IS) to export promotion

(EP). The results were mixed. During the IS period, total exports had no effect on economic growth in 14 of the countries, while during the EP period, agricultural exports caused unidirectional economic growth in nine countries. The study concluded that a significant number of countries were disadvantaged by the inward-oriented strategy during the IS period, which indicated that a blanket approach to implementing strategies without consideration of individual country characteristics should be avoided.

Söderbom and Teal (2003) determined the effects of manufacturing exports and economic growth by using a comparative assessment based on nine African countries with varying incomes. The study results showed a close relationship between general exports and economic growth and with no substantial evidence pointing towards manufacturing exports. The study highlighted that countries in SSA tend to specialize in garment exports, possibly due to the labour-intensive technology used in the sector. The paper concluded that the firm's efficiency is vital in determining its ability to enter the export market. This is relevant, considering that most of the firms in these countries are small (employing less than 100 people). The policy implications emerging from the research are that a strategic reassessment of export markets for Africa is necessary for the success of the export-led growth by shifting towards intra-Africa trade and taking advantage of the fast-growing population growth in the continent.

Foster (2006) examined the relationship between exports and economic growth in 49 African countries by using panel data averages of eight five-year periods from 1960-99. The study determined the existence of a threshold in the relationship using threshold regression techniques, finding a positive relationship between exports and output growth. A higher rate of export growth, the study found, indicates higher rates of economic growth. Also highlighted was the heterogeneity of African countries, which leads to the varying growth performance of countries within the continent. The study's conclusion and policy implications were that a lack of consensus on the research of exports in Africa may lead to the implementation of policies that perpetuate the continent's unsuccessful development goals.

Sinoha-Lopete (2006) conducted a study examining the causal relationship between exports and economic growth in nine Southern African countries (Botswana, Malawi, Mozambique, Namibia, Lesotho, South Africa, Swaziland, Zambia and Zimbabwe) using annual data from 1980 to 2002 using econometric techniques. Sinoha-Lopete tested the causal relationship between economic growth (GDP) and exports using three time-series techniques. The methods used are the unit root tests consisting of the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP), the Johansen co-integration test and the Granger- causality tests that assessed the causality likelihood ratio. Of the nine countries studied, Botswana, Lesotho, and

Swaziland were the most likely to gain value from export promotion policies compared to the others. The study concluded that emphasis on sound export policies is essential for these countries to continue increasing the positive effects on economic growth, poverty reduction and job creation.

Bahta (2007) evaluated the impact of trade on the economy of Lesotho. The study used a scenario-based approach using a computable general equilibrium (CGE) analysis that is based on a Social Accounting Matrix (SAM) for Lesotho. The scenarios were based on the following focal points underpinning trade in Lesotho: trade policy based on price changes, border protection particularly for textile sector exports, fiscal policy decisions and global commodity price fluctuations and the impact of trade policy on the economy. However, limitations of this model are cited to include technology and market variables and the inaccuracies that may arise from the absence of data when using the input-output system of the SAM. The study concluded that the country must diversify its export products beyond the concentration in textiles and explore other lucrative markets outside of the United States.

Rangasamy (2008) analyzed the relationship between exports and economic growth in South Africa, with emphasis on the effects of primary and non-primary exports on real GDP using the Johansen Multivariate framework. The results found a unidirectional causality of exports and real GDP in the South African economy and heavy reliance on primary exports, concluding that non-primary exports can play an even more significant role in the economic growth of South Africa. The policy implications are that policymakers need to identify and focus on the non-primary export products that can add the most value for growth.

Sayef (2017) analysed the nexus between exports and economic growth in Gabon using the co-integration and error correction models from 1980 to 2015. This research found that although there is evidence of exports being an engine of economic growth in the short term, investment and exports impact the economy negatively in the long run. One interpretation of the results is that despite investment and exports being critical aspects of economic growth in Gabon, extenuating variables such as mismanagement hinder the positive results from benefiting the country on a long term basis. For instance, the significant decline in annual oil production—a major export product of Gabon—has resulted in budget constraints over the years. Therefore, it is the government's prerogative to reassess the exports' basket in Gabon and explore alternative high-income exports.

Numerous factors, including policy changes and structural reforms, can impact the economy over a long period but may not be identifiable in the long term. Amji, Aye, Balcilar and Gupta (2015) used both linear and non-linear causality test approaches to examine the causal

relationship between exports and economic growth in South Africa from 1911 to 2011. The results of the classical linear Granger causality test revealed no relationship between exports and GDP. On the other hand, an assessment of the variables using the non-linear Granger causality test indicated a unidirectional causality from GDP to exports. The more robust Diks and Panchenko (2006) non-linear Granger causality test showed significant evidence of a bidirectional causal relationship. The study concluded that these results should prompt governments and policymakers to become more aware of the possible changes in the relationship between exports and GDP over time, which will aid better decision-making and resource allocation.

In a study covering 12 SSA countries from 1970 to 2013, Keho (2015) examined the relationship between foreign direct investment, exports and GDP. The research utilised the Johansen multivariate tests and the Granger causality test and had mixed results in different countries. It highlighted that trade reforms and trade liberalization attract less foreign direct investment (FDI) in most countries because trade reforms are viewed as transitory and non-credible. The study concluded that African countries should attract investors by ensuring that trade reforms and policies are irreversible and a more conducive environment is created by strengthening political stability and improving the conditions for doing business.

2.4 Export-Led Growth studies in Asia

A study by Shan and Sun (1998) examined the causal link between exports and economic growth in China was using the causality test developed by Toda and Yamamoto (1995). The study used time-series data from 1987 to 1996 and incorporated an augmented growth equation in a vector auto regression (VAR) system to solve specification bias. The findings indicated bidirectional causality between exports and real industrial output. The conclusion was that exports lead to economic growth in China, but economic growth also increases exports. A limitation of the specific model used in the study is that the short run and long-run relationships could not be determined.

Ekanayake (1999) analysed the causal relationship of exports on economic growth by analysing eight Asian developing countries' annual data from 1960 to 1997: India, Indonesia, Korea, Pakistan, Philippines, Sri Lanka, Thailand and Malaysia. The study used co-integration and error correction models in a bivariate model commonly used in multivariate models. Findings of the research showed bi-directional Granger causality in the relationship between exports and economic growth in all countries except Malaysia. Results of the short-run Granger causality further showed evidence of causality of economic growth to exports for all countries except Sri

Lanka. All countries showed long-run Granger causality from export growth to economic growth and short-run causality from export growth in all countries except Indonesia and Sri Lanka.

Examining the time-series data for 1973-1993, Vohra (2001) determined the impact of exports and economic growth in India, Pakistan, the Philippines, Malaysia and Thailand. Results indicated that exports have a positive effect on economic growth, especially in middle-income countries that have achieved a certain level of economic development. In conclusion, Vohra suggested that Malaysia, the Philippines, and Thailand need a liberal and free market for export expansion and to attract foreign direct investments. The implication is that, for exports to have a positive relationship with economic growth, developing countries should have reached a certain level of economic development. This could be due to policies and important non-restrictive economic structures such as technological advancements, an attractive environment for foreign direct investment, encouragement of entrepreneurship and ease of doing business that are usually inadequate or missing in developing countries.

The causal effects of exports on GDP in Korea were examined from 1963 to 2001 using the Granger-causality tests based on the VECM approach and the VAR modelling with integrated and co-integrated processes (Awokuse, 2005). Both approaches pointed to a bi-directional causal link between exports and economic growth, leading the author to conclude that there were periods in Korea when exports led to economic growth and others when economic growth led to increased growth in exports.

A study by Mishra (2011) interrogated the relationship between exports and economic growth in India by asking the following question: do exports lead to higher economic growth, or does economic growth promote exports? Evidence from the research—which used time-series data from 1970 to 2009 and employed co-integration and error correction modelling techniques—showed that an increase in GDP has a positive effect on exports in the long run. The paper ultimately rejects the export-led growth hypothesis as it showed that it is economic growth that increases exports in India.

2.5 Export-Led Growth studies Worldwide

Bahmani-Oskooee and Alse (1993) conducted a study that analyzed the export-led growth hypothesis in Colombia, Greece, Korea, Malaysia, Pakistan, Philippines, Singapore, South Africa and Thailand. The study used the co-integration approach and error correction models with quarterly data from 1973 to 1988. The findings pointed to bidirectional causality between export growth and real output for all nine countries except Malaysia. Long-run results indicated a positive

relationship between the two variables in all countries, consequently concluding that export promotion strategies in LDCs can be expected to result in economic growth.

The relationship between exports and economic growth in Canada was analyzed using the VAR model and Granger causality in three variables: real Canadian exports, real Canadian GDP and real Canadian terms of trade, defined as the export price as a percentage of import price (Henriques and Sardorsky, 1996). The co-integrating variables indicated that there is a long-run relationship between all three variables. According to results from the VAR, exports are growth-driven in Canada. There was no supporting evidence for the export-led growth hypothesis. In this study, the Granger causality approach was not to find the direction of causation but to determine whether the changes in exports precede or follow GDP changes. The authors found that the changes in growth precede changes in exports.

Similarly, Anwer and Sampath (1997) studied the relationship between exports and economic growth in 96 countries from 1960 to 1992 using unit root and co-integration techniques. The study rejected the export-led hypothesis in most countries as the results indicated that only 8 out of the 96 countries showed a relationship between exports and economic growth. In addition, eight countries showed unidirectional or bidirectional causation from exports to GDP, nine countries showed causation from GDP to exports, and ten countries showed no causation between GDP and exports.

For Chile, Herzer, Nowak-Lehmann and Silverstovs (2006) investigated the relationship between exports and economic growth using time series annual data from 1960 to 2001. They analyzed the effects of primary exports and manufactured products exports. The analysis determined an augmented neoclassical production function: the total factor productivity was estimated as a function of primary exports, manufactured exports and imported capital goods. The study used the Engle-Granger two-step estimation and Johansen's co-integration approach to determine the stationarity of the variables, followed by the Granger causality tests. The results showed a long-run relationship between capital, labour, capital goods imports, and manufactured exports, primary exports, and non-export GDP. There is also Granger causality from capital stock, aggregate employment, capital goods imports and exports of manufactured and primary products to non-export GDP. On the other hand, primary exports had a negative impact on non-export GDP, while manufactured product exports had a positive effect on non-export GDP. The study suggested that manufactured exports may offer more opportunity for knowledge spill overs than primary exports. The study concluded that manufactured products exports are more important for productivity and long-run economic growth than primary exports in Chile.

Waithe, Lorde and Francis (2010) studied the relationship between exports and economic growth in Mexico by analyzing data from 1960 to 2003 using an export-augmented production function framework and co integration and error correction techniques. The study results indicated that exports causes GDP in the short run while there is an inverse relationship between exports and GDP in the long run. According to Lorde and Francis, the results can be explained by high exports and low exports, weak backwards and forward linkages with suppliers, resulting in few opportunities that could arise from spillover and multiplier effects.

2.6 Evaluations and Studies of Agricultural Exports

Agricultural exports have remained an area of interest for many researchers and scholars. Researchers of economic development have studied the role of the agriculture sector and agricultural exports as catalysts for economic growth for many years. The research in this area mainly focuses on agricultural growth strategies, including import substitution, industrialisation and export promotion policies. This section of the paper first outlines agricultural exports theories while illustrating the different schools of thought from a historical perspective to modern times. That will be followed by the summation of empirical studies globally on the relationship between agricultural exports and economic growth.

The decline in African agricultural exports as a share of the global export market is a challenge for countries with outward-oriented growth strategies with limited product offerings. Johnston and Mellor (1961) argue that agricultural export diversification is crucial for offsetting the effects of poor demand in other products. They enunciate the advantages of agricultural exports diversification to include increased foreign exchange earnings and offsetting the vulnerability of having an economy that relies on a few crops. As a result, the disadvantages of a heavy reliance on agricultural exports in developing countries are the risks of price declines, particularly when price and income elasticities are low. Therefore, balancing agricultural and non-agricultural exports is beneficial for economies aiming to expand their exports. The paper further shows that agricultural productivity and increasing profitable agricultural exports are achievable because of factors such as moderate capital requirements for diversifying profitable agricultural exports and farmers' ability to absorb non-monetary investments. Consequently, weak agricultural output is often attributed to a lack of strategic implementation of growth policies rather than a lack of capital investment in the sector or poor resource endowment.

Kuznets (1963) demonstrated that the interrelation of agriculture with other sectors is essential to economic growth. This happens when items are purchased from other sectors needed

for production and when the produce is sold to pay for the purchases and to purchase other consumer goods. Subsequently, an avenue is created for the development of international flows and for the economy to grow. This supports economic development efforts by fostering the industrialisation of the economy, suggesting that agricultural advancements are an integral component for the industrialisation of developing countries.

Hirschman (1968) contends that to implement industrialisation strategies successfully, countries need to ensure that they are structurally prepared through sound investments in backward linkages within specific industries. This action will enable them to grow locally as this will ultimately position them adequately for exporting. The paper places emphasis on the role of demand for agricultural products and that the lack of demand for certain goods and services for these products may impede growth. Stakeholders need to prioritize technological advancements in the agricultural sector to induce the positive effect that agricultural growth has on other sectors. Additionally, Kutznets (1963) elucidates that extensive technological investment in agriculture consisting of chemicals, fertilizers, tools, and machinery is the first step for countries that have achieved economic growth. This creates a 'marketization' of the production process in agriculture due to the need to purchase the products from other sectors.

On the contrary, Adelman (1984) argues against the export-led growth model that emphasises import substitution industrialisation due to, among other reasons, increased vulnerability to export market shocks. The author creates the agricultural-demand-led-industrialisation (ADLI) programme, a development strategy that positions agriculture as the primary sector in developing country economies. The ADLI also enables industrialisation and linkages through increased agriculture productivity in small and medium-sized farms. The paper compares the export-led industrialisation and the ADLI model through simulation experiments carried out using the computable CGE model. The simulation was of a small, low-income, semi-industrial, open economy similar to 1963 South Korea. The experiments were performed in an international environment that represents the growth rate of international import demand at an estimated rate for 1960-73. The results are supportive of the ADLI approach.

Syrquin and Chenery (1989) examined the economies of more than 100 countries using time-series data over three decades. They classified the sample according to structure and trade policy and identified four categories: outward primary oriented economies, inward-oriented economies, balanced economies and industry-oriented economies. They found that agricultural exporters were all small economies, with larger economies transitioning into inward-oriented strategies through import substitution. The industry-oriented economies were mainly Asian economies signified by a rise in manufactured exports after a phase of import substitution and

high protectionism. In terms of these economies' performance, the research supported the outward-oriented promotion strategy, as all countries with an outward orientation had higher GDP growth, and specialized manufacturing economies performed better than primary specialised countries.

Both governance and structural issues may be among the major impediments to agricultural growth in developing countries. The continued reliance on raw material exports must be reevaluated against strategies aimed at creating income for a wider population. Vogel (1994) also supports the notion of agriculture being a leading sector and analyzes the role of agricultural production and linkages in developing economies. Three key observations emerged from the study. First, agriculture has solid backward linkages, which make it an ideal sector. Secondly, during the development process, the differences in forward and backwards linkages exist within the production structure of the economy, the agricultural technology and consumption matrices. These differences are due to efficiencies acquired during product specialization and diversification. Thirdly, the ADLI development strategy has greater chances of success in low- and middle-income countries with rural populations.

According to Leinchenko and O'Brien (2001), it is especially farmers participating in agricultural exports that are likely to be affected by global factors such as climate change, fluctuating food prices, drought and globalization. The authors examined the agricultural vulnerability of farmers in Southern Africa around how global and national economic changes impact their ability to manage climate vulnerability. The study found that trade liberalisation enables farmers to be less vulnerable to drought-related food shortages. The paper concludes that adaptation strategies for long-term effects of dealing with climate vulnerabilities must be a priority for developing countries.

Thirtle, Lin and Piesse (2003) conducted their analysis on the effects of agricultural productivity growth based on simple regressions applied on a sample size based on the populations living on less than $1 per day according to the World Bank poverty indicators. The method involves a four-equation causal chain model that includes various variables that affect poverty reduction. The results point to the positive effect of agricultural productivity growth on poverty reduction. In contrast, productivity growth in industry and services does not have the same effect. The authors also write that increased inequality raises poverty rates, while GDP per capita growth reduces it.

Similarly, Diao, Dorosh and Rahman (2003) examined the factors that lead to agricultural exports constraints paying particular attention to supply and demand-side factors and marketing costs and growth linkages. Their examination focused on various methods of analysis of historical

trends, micro-level studies reviews, projections of production, trade and incomes using scenarios and simulations. Results show that nontraditional agricultural exports (including fish) have the most opportunity for growth and are least affected by demand constraints. However, their share of total exports is too low to impact GDP significantly and is unlikely to grow in future based on simulation models using CGE. World prices severely impact traditional exports and are unlikely to considerably improve GDP, even with raised productivity. The paper suggests improving agricultural exports in SSA: improved regional integration of regional markets, reduced transaction costs in markets, reduced marketing costs, enhanced infrastructure development and increased growth in other sectors of the economy.

There is widespread consensus in agricultural discourse that foreign factors significantly impact the accessibility of global markets by farmers, reducing the chances of success for African exports. Kandero and Randa (2004) evaluated the factors that contribute to the challenges of exporting agricultural products from SSA to the global market by estimating an equation with foreign factors and domestic factors. The paper found macro distortions to be the most significant factor that impacted the shares of agricultural exports in the global market, while real exchange rate was not significant due to a flexible exchange rate regime compared to earlier years when they were fixed. The findings further indicated that structural factors such as investment in infrastructure and access to information are critical determinants of agro-exports from Africa. Other essential factors include agricultural inputs, agricultural productivity, high sensitivity to foreign markets policies, Organisation for Economic Co-operation and Development (OECD) tariff rates, subsidies and standards, and technical barriers.

In relation to the structural barriers that exist within the agricultural sector, Binswanger-Mkhize, McCalla and Patel (2010) recognise the diversity in SSA economic structures and offer advice for action plans that need to be customized and adapted to be country-specific. For growth in the agricultural sector in SSA, the economy needs support in the following ways: (a) continued implementation of sound macroeconomic policies, (b) the removal of the remaining agricultural taxation that still disadvantages African farmers relative to all other farmers in the world, (c) improving services for small farmers, (d) increasing investment significantly in agricultural technology and its dissemination, (e) empowering local governments, communities, and farmer organizations for their own development, and (f) strengthening the already established regional agricultural institutions.

Some writers argue that agricultural exports have not contributed to poverty reduction and economic transformation in African countries in the same way as Asian countries. For instance, Diao, Hazell and Thrulow (2010) argue that a large majority of African countries have

not successfully achieved an agricultural revolution and agricultural productivity in Africa is significantly low compared to the rest of the world. This paper examined the role of agriculture in the development of African countries by evaluating alternative paths for growth and poverty reduction. The study assessed a sample of six low-income African countries. The findings show that agricultural growth plays a more prominent role than the industrial sector in growth and poverty reduction, particularly in countries with good agro-ecological conditions. The industrial sector has weaker linkages to other sectors and provides fewer employment opportunities. While agriculture has emerged as an essential sector for all countries, those with higher growth rates and per capita incomes have the opportunity to diversify into higher-value products. In contrast, diversification is more limited in smaller, low growth economies. Agricultural exports do not benefit a wide range of people, specifically those in poor rural areas. Instead it typically benefits people in more urbanised areas.

2.6.1 The Agricultural Exports and Economic Growth Nexus

Dawson (2005) conducted a study on 62 LDCs using panel data from 1974-1995 and examined how agricultural exports affect economic growth. The study used a production function with provisions for agricultural and non-agricultural exports and an economic model dividing the agricultural and non-agricultural sectors into domestic non-export and export markets. The study showed a difference in economic growth between low, lower middle, and upper income LDCs where investment in agricultural exports has the same impact on economic growth as investment in non-agricultural exports. The findings of this study suggest that there should be more balanced export policies.

Francis, Iyare, and Lorde (2007) undertook a study on eight countries in the Caribbean using statistical data and time-series economic analysis and applying co-integration and error correction models to test the agricultural causal relationship between export diversification and economic growth. In the short run, the evidence suggests that economic growth results from agricultural export diversification in two countries, Belize and Barbados, and only in the Dominican Republic over a long period. The proposals for policy are avoiding regional agricultural diversification strategies uniform implementation. Other studies have shown that African countries displayed a diversification index of 0.5 or more, with a third showing a diversification index greater than 0.80 (Compared to 0.24 in Asia and 0.34 in Latin America). These indexes indicate a high export concentration level in African countries and a dependence

on natural resources (Morris and Fessehaie, 2014). The concentration of primary, traditional exports is also detrimental to economic growth due to the exposure of these highly sensitive products to price fluctuations on the global market. In addition, Szirmai and Verspagen (2011) argue that countries that specialize in agricultural and primary production limit their growth due to the increasing world markets that favour manufacturing goods.

The impact of agriculture on economic growth was examined using a sample of 15 developing and transitioning economies in Africa, Asia, and Latin America. This study used time series methods, extended neoclassical growth production function, and autoregressive distributed lag (ARDL) error correction model for short-run and long-run dynamic causation (Awokuse, 2008). The evidence captured in the results supports agriculture as a strong driver of economic growth. While there is strong support for the positive effect of agricultural exports on economic growth in Asia and Latin America, there seemed to be a weak relationship between exports and economic growth in the sample of African countries. This result further highlights the inability of African countries to penetrate world markets.

Lopez-Sanjuan and Dawson (2010) assessed how GDP affects agriculture and non-agriculture products by analysing a dataset consisting of yearly observations of GDP and agricultural and non-agricultural exports in 42 developing countries from the period of 1970 to 2004. The study used Multivariate co-integration methods that made provisions for structural breaks that occurred. The study results showed that there was a relationship between GDP and agricultural and non-agricultural exports over time. However, agricultural exports affected GDP more in low-income countries than lower to middle-income countries where non-agricultural exports had a greater impact. The authors propose that countries that earn more should focus more on non-agricultural exports for economic growth. In contrast, poorer developing countries should focus on balanced export-oriented policies because the elasticity of export products and GDP does not indicate significant differences and can foster economic growth equally.

Hatab, Romstad and Huo, (2010) analysed the relationship between agricultural exports and economic growth in Egypt. The study used a fixed-effects model appropriate for selecting countries predetermined and analysed the factors that influence agricultural exports in Egypt to its major trading partners from 1994 to 2008. The results showed that an increase in Egypt's GDP increases Egypt's agricultural export flows. Conversely, increased GDP per capita causes a decrease in exports. This means that the demand per capita for normal good rises when economic growth increases, which reduces exports. The study also identified the methodological problems that arise from models that estimate panel data by pooling it. They argue that the pooled model does not make provision for the heterogeneity of different countries and assumes that all

countries are the same by not estimating country-specific effects. They suggest that the random-effects model is ideal for estimating trade outflows for a random sample of trading partners from a larger population.

Izuchukwu (2011) examined the effect of agricultural growth on economic development by measuring three independent variables: domestic savings, government expenditure on agriculture and foreign direct investment on agriculture against Nigeria's GDP as the dependent variable. The study used time-series data over 22 years from 1986-2007 and found a positive relationship between the three variables and GDP. Despite this result, there are many problems associated with the agricultural sector's low yields and productivity in Nigeria. The study makes several suggestions to improve the sector: providing funding for University students to increase agricultural output, enabling farmers to borrow money at low interest rates, modernizing the sector through farm tools, improving research to improve farming systems, and irrigation seedlings and storage facilities.

Investments of capital and labour are essential factors in the growth of the agricultural sector. Raza, Ali and Mehboob (2012) analysed the relationship between agricultural exports and economic growth in Pakistan using secondary data collected from 1980-2010, applying simple regression to determine the relationship between agricultural sub-sectors and GDP. The results showed that while crops and livestock contributed 91 per cent towards the total agricultural sector, fisheries had a minimal contribution due to low investment intensity, insufficient facilities, and untrained and unskilled labour force. Furthermore, it is imperative to ensure no divergence between the exporting countries exports' basket and world export demand as this creates a demand and supply mismatch. For instance, Faridi (2012) indicated that Pakistan's major exports are textiles, other manufactures and food, constituting 51 per cent, 24 per cent and 15 per cent of total exports in 2009. Comparatively, the world export market in 2008 was focused on manufactures, machinery, transport equipment, fuels and mining products with proportions of 67 per cent, 34 per cent, 23 per cent and 18 per cent respectively.

Faridi (2012) also conducted a study to examine the role and contribution of agricultural exports on the economic growth in Pakistan. Faridi used the Johansen co-integration technique from the period of 1972 to 2008. The study concluded that agricultural exports do not affect economic growth. Secondly, there is an inverse relationship between economic growth and agricultural exports where economic growth declines as agricultural export increases. Third, non-agricultural exports have a positive impact on economic growth. The study suggests that the government should promote non-agricultural exports more. Furthermore, raw material exports

should diminish to focus on increasing the export share of value-added products, for instance, in circumstances where raw products like cotton manufactured into textiles.

Ohlan (2013) analysed the causal relationship between agricultural exports and GDP in India from 1970 to 2010 using the VECM model and Granger causality test. The study also conducted co-integration tests using the auto regressive distributed lag technique. The results show a positive long-run relationship between agricultural exports and GDP, supporting the export-led growth hypothesis. The study also found a unidirectional causal link from agricultural exports to GDP. The recommendations made in the study are that India must prioritize the improvement of agricultural export policies to enhance economic growth.

The mixed evidence and conclusions among researchers do not inform policymakers regarding the right strategies that are most beneficial to society. Dercon and Gollin (2014) extensively evaluate economic development literature to determine whether focusing on investing in the agricultural sector would provide the most benefit for SSA. They argue that it is a crucial determination to make because if investing in agriculture does not necessarily lead to improvements in social welfare compared to investments in other sectors, then a strategy based on agricultural growth would result in wasteful resources. The paper highlights that the heterogeneity between countries in this region is often ignored, resulting in the generalization of positive results and experiences that some farmers have achieved. Within the literature that the paper evaluated, there is no conclusive evidence that supports the agricultural-led development strategy and the promotion of the agricultural sector over other sectors in SSA. Therefore, in the absence of this definitive evidence, policy makers should be more careful when making investment choices and should instead employ a more balanced strategy that includes other sectors for growth in the region.

Shah, Abrah ul haq and Farooq (2015) also examined the effects of agricultural exports and non-agricultural exports on Pakistan's economy. This study used the Johansen co-integration method and secondary data from the period of 1972 to 2008. The results showed a negative relationship between agricultural exports and GDP while non-agricultural exports had a positive relationship. As a country that competes with countries like India and China for raw material exports that have low value on the world market, the paper suggests that structural changes to Pakistan's export policies must carefully incorporate and convert their exports to reflect a much higher proportion of value-added products.

Kang (2015) analyses the effects of rice exports in the top four producing countries in Asia: Thailand, Vietnam, India and Pakistan on economic growth using data from 1980 to 2010. The short and -run relationships between variables are analysed using the VECM, while the

causality between the variables was assessed using the Granger causality tests. The study results showed that rice exports have a positive effect on the economic growth of all four countries. As a result, the study suggests that policymakers should increase investment in this commodity to increase growth.

In Nigeria, the relationship between agricultural exports and economic growth was analysed using annual time series data from 1970 to 2012 by Ijirshar, (2015). The model used GDP as a proxy for economic growth and incorporated real exchange rate, real Agricultural exports index of Trade Openness and Inflation rate as exogenous variables. The study used the Augmented Dickey-Fuller test for unit roots, the Johansen co-integration test, and the error correction method. The results indicated a long-run relationship among the variables and a positive impact of agricultural exports on economic growth in Nigeria. The study concluded that the high concentration of the oil industry in the Nigerian economy is not sustainable due to its susceptibility to external shocks and recommended that the country undergo systematic reforms to incorporate agricultural production above other sectors to drive sustainable economic growth.

Similarly, Oluwatoyese, Dewiapplanaidu and Razak (2016) recognised the concentration of oil exports in the Nigerian economy and analysed the impact of diversifying the country's exports to incorporate a higher share of agricultural exports for sustainable growth. Their study examined the relationship between agricultural exports, oil exports and output growth in Nigeria using time series data from 1981 to 2014. Unit root tests were conducted using the Augmented Dickey-Fuller and Phillip-Perron tests, followed by the Johansen co-integration technique and the Granger Causality tests. The results of the study showed a long-run relationship between the three variables. The contribution of agricultural exports was highlighted at 2.1 per cent of GDP compared to 85.3 per cent for oil exports in 2014, which shows that Nigeria is not adequately utilising its vast agricultural resources. The study emphasised export diversification and concluded that the positive correlation between agricultural exports and GDP indicates that Nigeria has to diversify its exports to maximize economic growth and realise sustainable development in its domestic economy to yield long-term benefits.

The relationship between agricultural exports and economic growth amongst five member states (Kenya, Rwanda, Burundi, Tanzania and Uganda) and their trading partners in the East African Community (EAC) was analysed by Ouma, Kimani and Manyasa, (2016) using data from the period of 2000 to 2012. The study conducted unit root tests based on the Im-Peseran-Shim (1997) method, co-integration tests using the Johansen Fisher panel, Pedroni residual and Kao residual co-integration tests, and Granger causality tests. The results of the co-integration tests showed a long-run relationship between agricultural exports and economic growth. The

Granger causality tests showed a bi-directional relationship between agricultural exports and economic growth in Kenya, a uni-directional relationship in Rwanda, finding no causal relationship in Burundi, Tanzania and Uganda. The study highlighted the importance of intra-regional trade as it offsets the adverse effects of protectionist strategies from developed countries. Agricultural exports promotion strategies can be achieved by reducing technical barriers.

Simasiku and Sheefeni (2017) conducted a study to determine the impact of agricultural exports on Namibia's economic growth. The authors analysed time-series quarterly data from 1990 and 2014, using the Augmented Dickey-Fuller test, Johansen co-integration and the error correction techniques to determine stationarity and the long-run and short-run relationships between the variables. The findings indicated that while agricultural exports have a positive effect on economic growth, the effect is insignificant. On the other hand, non-agricultural exports have a positive and significant impact on GDP.

Edeme, Ifelunini and Nkalu, (2016) conducted a study on the impact of agricultural exports on the economic growth of fifteen of the Economic Community of West African States (ECOWAS) countries using panel data from the period of 1980 to 2013. The study used the classical Solow growth model and the fixed effects panel data estimation, with the following variables: labour force participation rate, capital stock, agricultural exports, non-agricultural exports, inflation and economic growth. The stationarity of the variables was determined using the Fisher unit root test. This method used and preferred due to its simplicity and alternative hypothesis of heterogeneity. The study also conducted the Hausman specification test to determine the appropriate fixed-effects or random-effects models. The results varied due to the diversity of countries within this region and the number of participating countries. Agricultural exports and economic growth led to weak positive relationships for the combined country effect. Therefore, have not contributed significantly to the region's economic growth. The country-specific results displayed a negative impact on countries such as Burkina Faso, Ghana, Senegal and Côte d'Ivoire. This is due to the underdevelopment of many countries in this region and the reforms undertaken by individual countries. The study's policy implications are that governments of these countries should adopt more synergized agricultural export growth policies focusing primarily on the commercialisation and mechanising of the agricultural sector and increased investment.

Toyin (2016) assessed the export-led hypothesis on agriculture export in South Africa using causality direction between processed and unprocessed agricultural products from 1975-2012. The results of the study did not significantly show causality between agricultural exports and GDP. This suggests that agricultural exports in the past were insufficient to stimulate

economic growth, meaning an agricultural export-led growth strategy would be possible through increased investments and incentives. In contrast, Belete and Bulagi (2015) assessed the causal relationship between agricultural exports and GDP in South Africa using the Granger causality test from 1994 until 2011 on avocado, apple, mango and orange. The study revealed unidirectional causality from agricultural exports to GDP and, therefore, suggests that more agricultural exports would increase GDP.

Alam and Myovella (2016) examined the effects of agricultural exports on the economy of Tanzania. Based on secondary time-series data from 1980 to 2010, the study showed a long-run relationship between agricultural exports and real GDP. Tanzania considered an agrarian economy as agriculture is the main contributor to its GDP and has a comparative advantage due to its cheap labour. To improve the problems associated with the agricultural sector, the study suggests employing further cost reduction by agricultural mechanization, increasing productivity, improving infrastructure and strengthening agricultural exports promotion policies.

A study by Bakari and Mohamed (2018) evaluated the influence of both agricultural exports and agricultural imports on four North African Countries: Morocco, Algeria, Tunisia and Egypt from 1982 to 2016 using correlation analysis and the static gravity estimation model. The study showed a positive correlation between agricultural exports and agricultural imports on economic growth, with the correlation between agricultural imports and economic growth being very strong. The estimation model results showed a positive effect of agricultural exports on economic growth, whereas there is no effect of agricultural imports on economic growth. The study concluded that agricultural exports are essential for economic growth in the four North African countries and suggests eliminating some agricultural imports as they not benefit economic growth and trade balance. New strategies are required to develop agricultural trade and investment. For the sector to become more profitable, foreign direct investment needs to be attracted to the sector to secure long-term commercial contracts.

Siaw, Jiang, Pickson, Dunya (2018) examined the relationship between agricultural exports and economic growth in the case of cocoa, banana and pineapple in Ghana using annual time series data from the period of 1990 to 2011 using the Autoregressive Distributed Lag (ARDL) model. The study results showed that only cocoa has a positive and significant effect on economic growth in the long-run and short-run and that pineapple and banana have a negative effect with pineapple being insignificant. Furthermore, there was unidirectional causality from banana to economic growth, bidirectional causation between cocoa and economic growth and no causation between pineapple and economic growth. The study recommended the publication of the performance of the Ghana Export Promotion Authority and Ghana Free Zones Board to attract

investors and access global markets to incorporate structural reforms in the sector to increase value in the Ghanaian agricultural export sector.

Ahmed and Sallam, (2018) examined the relationship between agricultural exports and GDP in Egypt using the Johansen cointegration technique and the ECM-GARCH model to determine the short run relationship between the variables. The study utilised time series annual data from 1970 to 2013. The results showed that a long-run relationship exists between agricultural exports and GDP. More specifically, the study found a positive correlation between agricultural exports and GDP in Egypt. The study concluded that while the Egyptian economy focused on industrial exports, these results indicate that policies aimed at creating an enabling environment for the agricultural exporters are necessary to influence the Egyptian economy's performance.

Some recent studies have contributed to agricultural exports literature by exploring the effects of agricultural exports on the economy, focusing on the relationship's firm level outcomes. Reaz, Bowyer, Vitale, Mahi and Dahir (2020) studied the influence of exports of agricultural raw materials and processed products or agriculture value-added exports at the firm level in Malaysia. The purpose was to determine which of these agricultural products contribute the most to the financial performance of the Malaysian agricultural industry. This study used the difference Gaussian Mixture Modelling (GMM) and the system GMM dynamic panel. The findings indicate show that the agriculture value-added exports have a significant impact on the performance of firms in the agricultural sector of Malaysia. The policy implication is that policymakers must consider more policies to increase investments in agriculture value-added products.

2.7 Intra-Africa Trade Discussion

There has been a proliferation of literature in recent years that supports the idea of enhancing trade amongst African countries as a strategy for economic growth. The trade arrangements that exist on the African continents were established to strengthen economic activity and improve trade between countries and within the different regions of the continent and as a way to form a basis for regional integration. The AFCFTA that has recently come into force will enable member states to strategize and redirect the destinations of some of its exports and also determine the benefits of importing from neighbouring countries. The following section will provide an overview of trade in Africa and evaluate the benefits of intra-Africa trade.

Foroutan and Pritchett (1993) conducted a study to determine whether the level of intra-regional trade amongst SSA countries is sufficient using a traditional gravity model amongst a

sample of nineteen countries. The method involves comparing the actual statistics of trade with what the model would predict. The results showed that imports from other SSA countries are higher than predicted for only nine of the nineteen countries. On the other hand, exports to other countries are predicted to be higher in eleven countries. The paper observes the need to reduce trade barriers to ensure higher intra-SSA trade. These barriers include poor communications and transportation infrastructure. Inadequate infrastructure, which contributes towards increased distance and associated transport costs, is also a hindrance for trade amongst SSA countries and other countries.

According to Greenaway and Sapsford, (1994, p. 158), "trade liberalization can mean one of at least three things: a reduction in import barriers with no change in export incentives; a movement of relative prices towards neutrality via a reduction in import barriers and/or an improvement in export incentives; the substitution of less costly for more costly instruments of protection, for example, tariffs for quotas." Greenaway and Sapsford used the time-series data of 19 countries and took a production function approach. They examined the relationship between exports and economic growth and how trade liberalization impacts the relationship. The findings did not show any positive effect between exports and economic growth and did not find a positive impact of trade liberalization.

In a study to determine whether intra-Africa trade reduces youth unemployment, Anyanwu (2014) analysed cross-sectional time-series data 1980 to 2010 and found an association between intra-African trade, indicating a reduction in aggregate female and male youth unemployment in Africa. Furthermore, the evidence suggested that domestic investment rate, institutionalized democracy, secondary education, inflation, economic growth, and higher urbanization are likely to reduce youth unemployment. Contrarily, Hartzenberg (2011) shows that poorly implemented regional integration agreements have not translated into improved economic performance. The author attributes this to the linear market integration model, which tends to focus on enhancing import tariffs, whereas supply-side constraints are the more prominent issues. This model often comprises a step-by-step process that starts with a free trade area, customs union, a common market, and integrating monetary and fiscal issues to establish an economic union and eventually form a political union. The paper proposes mitigating the supply side constraints by improving services, investment, competition policy, infrastructure development and ease of doing business, amongst others.

Morris and Fessehaie (2014) suggest that robust industrialisation that involves backwards and forwards linkages to the commodity sector is important for poverty alleviation and job creation. Upstream and downstream manufacturing and service sectors can provide opportunities

to businesses and semi-skilled to skilled labour. The soft commodity sectors and resource-processing industries can stimulate the supply of raw materials, further creating employment in agriculture. In addition, forward linkages will lead to the accrual of higher export revenues and foreign exchange earnings. Linkages refer to the backward and forward purchasing relationships created within various sectors and subsectors. Therefore, African countries need to remain export-focused to develop the capacity to manufacture their own primary products and export goods with added value (Szirmai and Verspagen, 2011).

Opoku and Yan (2019) support the notion that widespread industrialisation in Africa is essential to drive sustainable economic growth due to the potential benefits of expanding exports and opening up the economies to technology spill overs. Their research examined the impact of industrialisation on economic growth through a panel study of 37 African countries from 1980 to 2014, using the generalized method of moments. The study aimed to determine how industrialisation can benefit Africa and found that it can boost Africa's economic growth and that trade openness is critical in facilitating the process. In terms of policy suggestions, the study considers the many existing policies and initiatives that have prioritised industrialisation to achieve economic growth in Africa and seeks to fill the gaps in knowledge.

Stakeholders cannot make economic growth a reality through a blanket approach for a diverse continent with varying capabilities due to geographical and historical factors. African countries are diverse—some countries are landlocked, others are in coastal areas, and many have long histories of violence and subjugation by colonial powers. Policymakers must be cognisant of all these factors and make evidence-based decisions without imposing policies such as industrialisation that may be successful in other parts of the world but may not be realistic for Africa. For example, Opoku and Yan (2019) argue that Africa has skipped the industrial phase into the services phase, having failed to advantage of its fertile land and natural resources to transform raw materials that can increase local consumption add value to exports through industrialisation. Evidence in recent years has shown a decline in the manufacturing sector in Africa. While the industry contributes significantly to economic growth in regions such as Asia, the sector's growth is generally slow relative to GDP and has been the lowest contributor of employment compared to the services and agricultural sectors on the continent from 2000 to 2015.

The demand for African goods by world markets is mainly for products such as metals, petroleum, and minerals, sometimes referred to as "extractables." These primary commodities are susceptible to price and volume fluctuations and do not have significant backward linkages and spillover effects on the economy (Berahub and Dadush (2018). These metals are important

in the production processes and value chains of high demand consumable goods, such as copper in cellphones and vehicles. This global demand for goods viz a vis that of African goods by other African countries shows the importance of having trade partners. African countries must shift towards regional markets that will value their export offerings. This is also relevant in the COVID-19 era that severely affected industries, leading to travel restrictions and other barriers, which may further bar access to international markets.

The primary commodities in Berahub and Dadush (2018) differ from the primary agricultural products found to have a positive effect on the economy in previously mentioned studies such as Diao, Hazell and Thurlow (2010) and Thitle, Lin and Piesse, (2003). Thitle et al found that agriculture has strong linkages to other sectors and has a positive role in poverty reduction and inclusion of the rural economy.

In light of the recent protectionist efforts from the United States and the British people's desires to exclude themselves from the European Union through the Brexit agreement, this is an opportune time for Africans to embark on pan-African ideals and rely on intra-Africa trade. The African Continental Free Trade Area (ACFTA) offers an opportunity for countries to expand their growth beyond the limitations of local markets within the African continent (Berahub and Dadush, 2018). Other benefits of the ACFTA include the facilitation of investment and enabling intellectual property rights. Achieving the objectives of the AFCFTA—including reduction of tariffs, trade facilitation, and improving regulatory measures—will not be an easy task. It is, however, a critical undertaking because achieving the objectives will narrow the trade divide between African countries and offer support for businesses and industries. To accelerate growth and access to markets, Africa needs regional integration similar to that of the European Union to enable Africans to penetrate regional markets for better growth prospects and eventually allow people's free movement. The AFCFTA is a step in the right direction to unify an immensely diverse and divided continent.

Maliswewska and Ruta (2020) argue that the AFCFTA can lift 30 million people out of poverty and consolidate the continent's GDP worth US$3.4 trillion across 55 countries. This previously untapped potential exists because of poor integration and trade amongst Africans. For example, research shows that trade between the largest North African countries, Algeria, Egypt and Morocco, only constituted 0.5 per cent, 3.5 per cent and 2.9 per cent of their total trade in 2016, respectively (Berahub and Dadush, 2018). There are substantial capital outflows from the African continent to other countries annually instead of circulating within the continent to contribute to poverty reduction, improving health and education, supporting businesses, and funding entrepreneurs to create employment.

Maliswewska and Rita (2020) carried out a study that analysed the long term and short term implications of the AFCFTA using the CGE model and micro simulation framework by quantifying the implications of revenue from tariffs. The analysis focuses on economic growth, international trade, poverty, and employment for female and male workers. According to the baseline results from the scenarios generated by the study, by 2035, output under the AFCFTA may increase by US$211. Natural resources and services will rise at 1.7 per cent, manufacturing at 1.2 per cent and a decline in agricultural output at 0.5 per cent even though it will be the fastest-growing sector in all parts of the continent except North Africa. Intra-Africa trade will increase by 81 per cent but will only constitute 20 per cent of total trade. Exports will be mainly from manufacturing compared to smaller margins from agriculture. The effects on employment are only based on the analysis on job reallocation (switching jobs) due to shifting trends of work and sectors, and therefore does not provide a fuller picture of how the agreement will foster job creation and attract investors into the continent. Similarly, income gains considered only income from tariff liberalization, which will increase only 7 per cent by 2035.

The analysis provides policymakers with foresight into the implications of the AFCFTA and provides an opportunity to make adjustments where necessary. The low earnings based on the improved tariff barriers indicate the high costs that non-tariff barriers have on trade in Africa. Therefore, an opportunity exists at the national level to improve unnecessary paper work and administrative bottlenecks to facilitate faster movement of goods and services across borders. It is also incumbent upon each country to eradicate other growth barriers, including fostering an environment conducive to business and entrepreneurship by removing the barriers to entry and improving education to empower the youth. However, the AFCFTA cannot reach its full potential without the protocol on the free movement of persons coming into force. This particular piece of legislation is essential in creating an environment where stakeholders can travel easily to negotiate deals, access markets and build partnerships.

Some authors have proposed that regional integration can contribute significantly to economic development and job creation by reducing costs and improving the informal sector's business conditions. This is especially the case when they can cross borders to conduct business activities such as purchasing goods or selling to nearby markets. Oloruntoba (2018) assessed the impact of regional integration on the informal cross border trade highlighted the role of regional integration on economic development and increased trade. The study concludes that beyond the trade benefits, stakeholders should view regional integration from a pan-Africanist approach. The paper further states that this particular approach "facilitates the flow of culture, ideas and other forms of beneficial exchanges. Ultimately, this could facilitate the construction of African identity

and personality that is self-aware, patriotic and committed to the continent's transformation. Despite the official restrictions that the artificial borders continue to impose on informal cross border trade, these active economic agents have continued to contribute significantly to the economy of the continent." (p. 25)

2.8 Summary and Conclusions

The previous chapter provided a plethora of research papers and studies on the relationship between exports and economic growth. The first section outlined the different methodologies of analysing the export-led growth hypothesis from a historical perspective. The global view of export-led growth studies focusing on Africa, Asia and the rest of the world followed. The following section evaluated studies on agricultural exports, paying particular attention to the African context. Finally, the chapter outlined the intra-Africa trade discourse, highlighting the AFCFTA for its relevance to the current climate.

The methodologies used a combination of co-integration and causality tests. The results of the various studies are mixed. In Africa, issues emerged about the need for industrialisation and a focus on value-added exports. The intra-Africa trade discussion indicated an alternative to highly competitive and regulated Western markets.

3 RESEARCH STRATEGY, DESIGN, PROCEDURE AND METHODS

3.1 Research Strategy

A research strategy informs the structure and direction of a research paper to achieve the research objectives. The objectives of the study determine whether the research strategy will be qualitative, quantitative or mixed. This study employs a quantitative research strategy. The study focuses on the effects of wool, cotton and fish on the economic growth in Lesotho from and to also analyze the effect of the components of domestic demand on economic growth.

The following independent and dependent variables have been identified:

Gross Domestic Product (GDP): The dependent variable in the study is the GDP because that data will determine the economy's performance over time and how the agricultural commodities have affected it. It is used to represent economic growth.

Gross fixed Capital Formation (CAP): Capital investment determines the future production of goods and services. These future expectations are used in matching the production levels with consumer demands. Changes in investment can be caused by higher interest rates because the cost of borrowing rises and decreases aggregate demand.

Consumer Price Index (CPI): Consumer confidence determines the changes in household consumption, where consumers tend to purchase more goods and services and thus increase the aggregate demand.

Government Consumption Expenditure (GC): This represents an aggregate amount of the money spent by the government on goods and services in its total national income accounts.

Wool Exports (WE): Wool is the leading agricultural export commodity in Lesotho. This commodity has been exported from the country for decades and plays a pivotal role in unemployment and poverty alleviation, particularly amongst the rural population.

Cotton Exports (CTE): Cotton is the second exportable agricultural product in Lesotho. It has attracted local production and investment and has an increasing demand in the world market.

Fish Exports (FE): Fish is the third exportable agricultural commodity in Lesotho and is currently increasing popularity in the world market with products such as trout and salmon. Fish export will improve through investment, and expansion will affect the productivity of the economy.

3.2 Research Design

Bryman (2012) describes five generic research designs: cross-sectional, longitudinal, case study, comparative, and experimental. This study has followed the models from Tsen (2010), Tnampubolon and Loh (2020). The data described in the research strategy above is included in the model as follows:

$$Y_t = f(CAP_t, CPI_t, GC_t, WE_t, CTE_t, FE_t) \quad (1)$$

The model will then include natural logs on both sides which leads to the following equation:

$$\log GDP = \log \alpha_0 + \alpha_1 \log CAP + \alpha_2 \log CPI + \alpha_3 \log GC + \alpha_4 \log WE + \alpha_5 \log CTE + \alpha_6 \log FE + \varepsilon \quad (2)$$

$$\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6 > 0$$

Where: $\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6$ are parameters to be estimated, and

GDP =Gross Domestic Product

CAP = Gross fixed capital formation

CPI = Consumer Price Index

GC = Government Consumption Expenditure

WE = Wool Export

CTE = Cotton Export

FE = Fish Export

ε = Error Term

3.3 Research Procedure and Methods

3.3.1 Research Data and Information Collection Instrument(s)

The research collected data from official statistics published by the Central Bank of Lesotho, World Bank, United Nations and the Ministry of Trade and Industry in Lesotho. The data collected is the yearly export values of the three agricultural commodities in US dollars: wool

and mohair, cotton and fish for a 30-year period from 1999 to 2020. The data for annual GDP growth rates will be used for the same period to determine the economic growth values.

3.3.2 Research Target Population

This study is conducted in Lesotho, a small mountainous landlocked country completely surrounded by South Africa. The country has a population of 2.1 million with a surface area of 30 355 kilometres squared. It is the only country in the world that is situated 1000m above sea level. The country is geographically divided into ten districts which are located in the lowlands and highlands. The lowlands and highlights differ in terms of climate and altitude, the former has warmer climate conditions, and the latter has colder weather throughout the year.

The main export commodities of Lesotho are garments and textiles, water and diamonds. Wool is the largest agricultural export commodity and is produced throughout the country through farmers who have created cooperatives that enable them to export the wool to Port Elizabeth, South Africa, where it is sorted and transported to the international markets.

Cotton has been grown in Lesotho for many years, with the commodity attracting investors in recent years due to the AGOA and its ability to grow even in harsh weather conditions. However, large quantities required in the manufacturing process are imported from neighboring African countries including Zambia, Zimbabwe and Mozambique. The farming of fish has become increasingly popular in Lesotho, with trout and salmon being the main types of fish available for export. The demand for fish is expected to rise, which will further diversify the current 17 species that are farmed in the country. According to Golub and Varma (2014, p.4), "Fish is one of the largest commodities in world trade by value and accounts for approximately 10 per cent of total world agricultural exports. Exports as a proportion of production rose from 25 per cent in 1976 to 38 per cent in 2010." The EU, the US and Japan are the largest fish importers globally. The increasingly expanding global market demand creates an opportunity for fish export growth in Lesotho.

3.3.3 Ethical Considerations in Research Data Collection

Ethics were considered in conducting this research. This is desktop research using the analysis of secondary data. Therefore, there was no human contact or permission necessary to interview any persons. The data will not involve any minors or vulnerable persons.

3.3.4 Research Data and Information Collection Process

The four modes of data collection are participant observation or ethnography, interviews, focus group discussion and documents. Based on the objectives and research design, this study used documents for research data collection. The data needed for this research dated from 1990 to 2020, stored in documents and repositories of export data and from official websites publishing economic data. The data will be stored in a secured computer that is locked using a password. The analysis and final research results will also be stored in a secure computer and will not be shared publically unless the author grants permission.

3.3.5 Research Data and Information Processing and Analysis

3.3.5.1 Research data and information processing

Research data processing involves the editing, sorting and consolidation of the data from various sources. The process of data coding, data entry and data cleaning was involved in processing data for this research using econometrics software.

3.3.5.2 Research data and information analysis

Objective One

The trend of agricultural exports over a long period is analysed using descriptive statistics. This analysis will highlight information on variables within a dataset and identify whether relationships exist between variables.

Objectives Two, Three, Four and Five

The influence of wool, cotton, and fish on Lesotho's economic growth is analysed in two ways: using short-run and long-run effects on Lesotho's economic growth using different time series data techniques. Co-integration and error correction models are applied. The first step is to determine whether the variables are stationary or non-stationary (stationarity). These are known

as unit root tests and are done using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. Afterwards, the co-integration analysis is conducted on a stationary series. The Johansen co-integration test was performed using the assumption of intercept, no trend and lag 2 for VAR.

Stationarity and Non-Stationarity

The first step in an econometrics study involved determining the stationarity of the time-series. This step is vital because stationary series is easier to understand due to the statistical properties of the movements that remain the same over time. Non-stationary time-series do not provide accurate results in that they may indicate a relationship between variables even when there is none. The mean and covariance in a non-stationary series does not remain the same over time, whereas these remain constant in a stationary series.

Non-stationary time-series can be transformed into stationary series. One way of achieving this is by differencing (*d*), which eliminates the changes in the levels of the time series to make it more stable. Difference stationary processes have one or more unit roots. Another method is converting a time series into a stationary series where an underlying trend is removed, known as a trend stationary process. A unit root test was conducted to determine whether the time series is non-stationary and contains a unit root.

Some popular time-series techniques are derived from the work of Granger (1969) which is based on the foundation of Wiener (1956). The Granger causality test and its variations are the commonly used unit root tests because of the ability to incorporate past values' effects on the present value (Furuoka, 2018). The validity of the Granger or Sims tests occurs only in cases where the original time series are stationary (Toda and Phillips, 1993

The following equations are derived based on the various possibilities of the unit root tests:

$$\Delta Y_t = \delta Y_{t-1} + \varepsilon_t \quad (3)$$

No Constant, No trend

$$\Delta Y_t = \alpha_0 + \delta Y_{t-1} + \varepsilon_t \quad (4)$$

With Constant, without trend

$$\Delta Y_t = \alpha_0 + \alpha_1 t + \delta Y_{t-1} + \varepsilon_t \quad (5)$$

With constant and trend

Where t represents time or trend

The null hypothesis is defined as the presence of a unit root and non-stationarity of the time series. That is: $H_0 = \delta = 0$.The alternate hypothesis is where the time series is stationary. That is: $H_1 = \delta < 0$

The Augmented Dickey-Fuller test is used in cases where ε_t is correlated. The equations are augmented by including the lagged values of Y_t , that is the dependent variable:

$$\Delta Y_t = \delta Y_{t-1} + \beta_t \sum_{t-1}^{m} \Delta Y_{t-1} + \varepsilon_t \quad (6)$$

No constant, no trend

$$\Delta Y_t = \alpha_0 + \delta Y_{t-1} + \beta_t \sum_{t-1}^{m} \Delta Y_{t-1} + \varepsilon_t \quad (7)$$

With constant, without trend

$$\Delta Y_t = \alpha_0 + \alpha_1^t + \delta Y_{t-1} + \beta_t \sum_{t-1}^{m} \Delta Y_{t-1} + \varepsilon_t \quad (8)$$

With constant and trend

Where ADF test statistic is greater than the critical value the series will be said to be stationary and where the ADF statistic is less than the critical value the series is non-stationary. The stationarity will be tested using the following hypotheses:

$H_0 = Y_t$: Where there is unit root and it is not stationary

$H_1 = Y_t$: Where there is stationarity or there is no unit root

The Phillips-Perron is an alternative test for unit root and is also applied in this study. Cuthbertson, Hall and Taylor (1992) indicate that Phillips and Perron (1988) and Perron (1988) suggest a non-parametric procedure that considers the correlation of the series within the model.

Co-Integration

Cuthbertson, Hall, and Taylor (1992) indicate that non-stationary variables contain stochastic or random trends. On the other hand, stationary variables contain deterministic or fixed trends. The data that contains these random trends has to be eliminated because it usually results in spurious correlations. The test for unit roots in data series will be conducted to determine whether the series contains one or more unit roots (non-stationarity). In the instance where non-stationarity has been established, co-integration will be determined. The Johansen technique reveals the exact number of co-integrating relationships present between variables in the model, and the nature of these relationships.

The basic formula for co-integration that is based on residuals is as follows:

$\varepsilon_t = Y_t - \alpha_0 - \alpha_1 X_t$ (9)

The following equation is used to test for co-integration:

$\Delta\varepsilon_t = \mu + \varphi\varepsilon_{t-1} + \varepsilon_t$ (10)

Therefore, we set the following:

H_0 = no co-integration ($\varphi = 0$)

H_1 = co-integration ($\varphi \neq 0$)

Co-integration is examined by the Johansen approach. The co-integration hypothesis is accepted if the value of the relationships is greater than or equal to one. In the case where the likelihood ratio is greater than the critical value, co-integration is accepted. If the likelihood ratio is not greater than the critical value, the co-integration hypothesis is rejected. The generalized Johansen's procedure is as follows:

$\Delta y_t = \alpha\beta' y_{t-1} + \sum_{i=1}^{p-1} \Pi \, i\Delta y_{t-1} + \varepsilon_t$ (11)

$\Pi = '$, where α indicates the speed of adjustment to equilibrium and β is a matrix of long-run coefficients and y_t is assumed to be a vector of non-stationarity I(1) (Cuthbertson et. al., 1992). There are two tests for testing the Π matrix rank, namely: the maximum eigenvalue and the trace tests. These are denoted as follows:

$\lambda_{trace}\,(r)$ = -T$\sum_{i=r+1}^{n} \ln(1 - \lambda i)$ (12)

λ_{max} (r, r+1) = -Tln(1-λ_{r+1}) (13)

Where

T is the number of observations and λ are estimated Eigen values

Cuthbertson et. al. (1992) advices that the tests must be done sequentially starting from λ0, λ1 until λn-1. A large statistic value outcome means that the null hypothesis should be rejected. The eigenvectors corresponding to the non-stationarity of the model, the eigenvalues λi=0 for i=r+1, …n. The null hypothesis: H0: indicates r co-integrating vectors and corresponds to H0: λi = 0, i=r+1,,…,n. that shows the first r eigenvalues which are non-zero (λi ≠ 0, i=1,…,r)

Error Correction Model

The ECM is useful in long-run relationships as it includes a term for the deviation and estimates the disequilibrium for the following period. In the instances where two variables are co-integrated, the ECM corrects the equilibrium errors from one period that can be transferred to

the next. Therefore, the deviation from the long-run relationship should be included as an explanatory variable in an Error Correction Model which can be presented as follows:

$$\Delta Y_t = \alpha_0 + \alpha_1 + \Delta X_t + \alpha_2 \mu_{t-1} + \varepsilon_t \quad (14)$$

Where $\Delta Y_t = Y_t - Y_{t-1,}\ \Delta X = X_t - X_{t-1,} \alpha_1 and\ \alpha_2$ represent the adjustment coefficients

μ_{t-1} is the lag of residual that represents short-run adjustments and ε_t represents the random error term.

The following equation is the estimated error correction model: (15)

Where:

$\Delta \mathrm{L}\, GDP_t = \alpha_0$ represents the changed natural logarithms of real domestic product

$\Delta LCAP_t, \Delta LCPI_t, \Delta \mathrm{L}\, GC_t, \Delta LWE_t, \Delta LCTE_t\ and\ \Delta LFE_t$ represent the change in natural logarithms of total labour force, gross domestic fixed capital formation, consumer price index, real exchange rate, wool exports, cotton exports and fish exports respectively.

α_0 is the constant term, while $\alpha_{1,}\ \alpha_2, \alpha_3,\ \alpha_4, \alpha_5, \alpha_6$ are the parameters of the independent variables, ε_t is the stochastic error term, ECM_{t-1} is the short run adjustments and β is the coefficient term of the error correction.

Objective Six

The causality between the variables will be achieved by applying tests by Granger (1969) that are used to determine whether a lagged value is the series is able to predict another. The causation can be unidirectional or bidirectional.

The equation can be as follows:

$$Y_t = b_0 + \sum b_j\, Y_{t-j} + \sum C_j\, X_{t-j} + \varepsilon_t \quad (16)$$

If C_j=0 and j = 1,2….k, X_t does not cause Y_t; then $H_0: c_j = 0$ and $H_1: c_j \neq 0$ when using an F test (Yifru, 2015). The model in this study which has examined wool, cotton and fish will therefore be as followed:

$$\mathrm{Ln}RGDP_t = b0 + \sum b_j \ln RGDP_{t-j} + \sum c_j \ln WE_{t-j} + \varepsilon_t \quad (17)$$

$$\ln WE_t = b0 + \sum b_j lnWE_{t-j} + \sum c_j lnRGDP_{t-j} + \varepsilon_t \quad (18)$$

$$\mathrm{LnRGD}P_t = b0 + \sum b_j\, RGDP_{t-j} + \sum c_j\, lnCTE_{t-j} + \varepsilon_t \quad (19)$$

$$\ln \mathrm{CT}E_t = b0 + \sum b_j\, lnCTE_{t-j} + \sum c_j lnRGDP_{t-j} + \varepsilon_t \quad (20)$$

$$\mathrm{LnRGD}P_t = b0 + \sum b_j RGDP_{t-j} + \sum c_j lnFE_{t-j} + \varepsilon_t \quad (21)$$

$$\ln \mathrm{F}E_t = b0 + \sum b_j\, lnFE_{t-j} + \sum c_j lnRGDP_{t-j} + \varepsilon_t \quad (22)$$

lnRGDPt is real gross domestic product in natural logarithm form, lnRGDPt-j is the lagged natural logarithm of the real domestic product

lnWEt is natural logarithm of wool export, while lnWEt-j is natural logarithm of lagged wool exports

lnCTEt is natural logarithm of cotton export, while lnCTEt-j is natural logorithm of lagged cotton exports

lnFEt is the natural logarithm of fish exports, while lnFEt-j is the natural logarithm of fish exports.

3.4 Research Reliability and Validity Measures Applied

Reliability and validity are essential in research as they determine the quality of the study. Research reliability refers to the level of consistency in the measurement. In other words, whether the study would result in the same results if conducted elsewhere with similar variables. The validity, on the other hand, refers to the accuracy of the measure. In other words, whether it measures what it meant to measure. The model is both reliable and valid, based on previous similar studies and a thorough literature review presentation.

3.5 Research Technical and Administrative Limitations

The limitations that may affect the study results include the inaccuracy of some of the data from earlier years and some of the missing data.

4 PRESENTATION OF RESEARCH RESULTS

Agriculture is a crucial source of income for people living mainly in the rural areas in Lesotho. However, agriculture only constitutes about 17 per cent of GDP (FAO, 2019), with industries such as manufacturing, construction and mining being the major contributors to the GDP. This chapter outlines the empirical results according to the objectives of the study. The first part of the section will focus on agricultural exports trends for a 30-year period from 1990 to 2020. This will be followed by an overview of the descriptive statistics of agricultural exports. Lastly, the chapter will present the econometrics analysis results, which encompasses unit root tests, co-integration test, long run regression analysis, error correction model, and the Granger causality tests.

4.1 Agricultural Exports Trends in Lesotho

4.1.1 Wool Exports Trends in Lesotho



Figure 1 Value of Wool Exports from 1990 to 2020

4.1.2 Cotton Exports Trends in Lesotho



Figure 2 Value of Cotton exports in Lesotho from 1990 to 2020

4.1.3 Fish Exports Trends in Lesotho

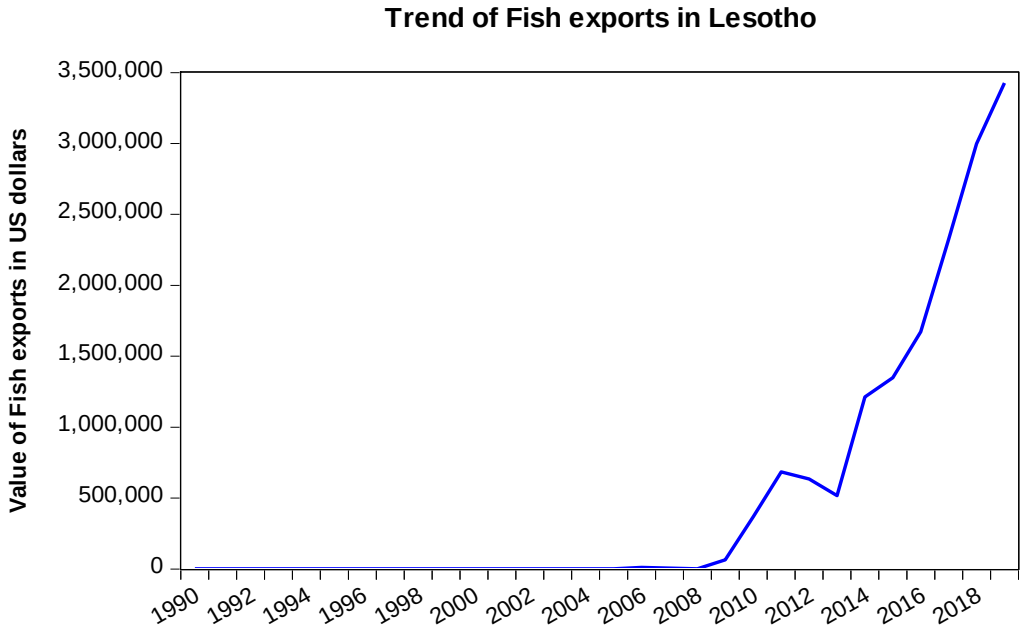


Figure 3 Value of Fish Exports in Lesotho from 1990 to 2020

4.2 Descriptive Analysis of Data

Table 1 Descriptive Statistics

	GDP	CAP	CPI	GC	CTE	FE	WE
Mean	16276.10	3427.07	56.826	4755.07	17 784 952	812 888	17 880 845
Min	9211.40	748.12	0.000	1602.13	38 894	1276.0	372 402
Max	24485.93	7091.56	155.85	9887.64	35 522 117	3 825 726	37 949 020
Std.dev	4963.75	1951.51	45.473	3007.97	111875	107155	1.3351
Skewness	0.387	0.487	0.548	0.55	0.00997	2.051	0.4344

Table 1 presents the descriptive statistics of the variables used in the model. The purpose is to provide a quick overview and analysis of the data. The table shows the mean, minimum value, maximum value, standard deviation and the skewness of the data from 1990 to 2020. The numbers in the unshaded area on the table are in Million Maloti, while CTE, FE and WE figures are in US dollars, to provide consistency with the figures on the export trends in the previous section. The average GDP of Lesotho is approximately 16.276 billion maloti, investments averaged 3.427 billion maloti and the average government consumption is approximately 4.755 billion maloti while the CPI average is 56.82.

4.3 Econometrics Analysis

4.3.1 Unit Root Tests

Table 2 Unit Root Tests in Levels I (0)

	ADF		PP	
	Constant p-value	Constant and Trend p-value	Constant p-value	Constant and Trend p-value
LGDP	0.9752	0.3695	0.9746	0.5664
LCPI	0.9897	0.2597	0.9901	0.2949
LCAP	0.7838	0.8662	0.7282	0.6624

LGC	0.9812	0.6502	0.9819	0.6455
LCTE	0.7685	0.4193	0.3327	0.4031
LFE	0.9302	0.9998	0.8099	0.9863
LWE	0.9246	0.4935	0.5496	0.0004

Table 3 Unit root tests in level I (1)

	ADF		**PP**	
	Constant	**Constant and Trend**	**Constant**	**Constant and Trend**
	p-value	**p-value**	**p-value**	**p-value**
LGDP	0.0000	0.0000	0.0001	0.0008
LCPI	0.0000	0.0000	0.0000	0.0000
LCAP	0.0004	0.0031	0.0003	0.0022
LGC	0.0002	0.0009	0.0002	0.0009
LCTE	0.000	0.000	0.0000	0.0000
LFE	0.0001	0.0002	0.0000	0.0002
LWE	0.000	0.0034	0.0000	0.0000

Table 2 and 3 above show the results of the unit root tests using the Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) tests. Table 2 indicates the unit root test at level I (0). The null hypothesis states that there is a unit root. The p-values data in Table 2 mean that we accept the null hypothesis in most of the variables, making it an unpredictable data series. Table 3 indicates the unit test results at first difference I (0). The null hypothesis for all the variables is rejected at the 0.05 level. Therefore, the data is stationary at first difference.

4.3.2 Co-Integration Tests

The Johansen co-integration test was conducted using the assumption of intercept, no trend and 2 lag for VAR. The lag selection was determined using the lag length selection criteria shown below in Table 4.

Table 4 Results for the lag length selection criteria

Lags	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**

0	-2791.361	N/A	9.54+76	199.9544	200.3350	200.0707
1	-2619.934	232.6518	5.36e+73	192.2810	195.7066	193.3282
2	-2502.034	92.63543*	4.47e+72*	188.4310	194.9017*	190.4092*

*indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5%)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 5 Co-integration rank test

No. of CEs	Eigen Value	λ_{trace}	0.05 Critical Value	Probability at 5%
0	0.982945	297.1690	169.5991	0.0000
1	0.880701	183.1721	134.6780	0.0000
2	0.777007	123.6407	103.8473	0.0013
3	0.638046	81.62338	76.97277	0.0211
4	0.597100	53.16872	54.07904	0.0602
5	0.398643	27.71485	35.19275	0.2543
6	0.266728	13.47498	20.26184	0.3271

4.3.3 Long-Run Relationships

After determining that long-run relationships exist in the time series, the long-run regression model was used to assess the long-run relationships of the independent variables to the dependent variable. This is based on equation 3 of the study. The results are shown below in Table 7.

Table 7 Long run relationships between agricultural exports and economic growth

Variable **lnGDP (dependent)**	Coefficient	Probability
lnCAP	-0.035	0.9534
lnCPI	1.009	0.0570
lnGC	0.674	0.0604
lnWE	2.698	0.0502

lnCTE	33.639	0.0002
lnFE	-2.648	0.9411

R-squared	0.987493
Adjusted R-squared	0.976772
Durbin-Watson	1.756150

Table 7 shows the results of the long-run regression model. The adjusted R-squared result demonstrates that this is a good model at approximately 97 per cent. The dependent variable is GDP, and the independent variables shown in the model are Gross fixed Capital Formation (CAP), Consumer Price Index (CPI), Government Consumption Expenditure (GC), Wool Exports (WE), Cotton Exports (CTE) and Fish Exports (FE).

4.3.4 Error Correction Model

The error correction model is used to determine whether there are any short-run relationships in the model. The purpose is to assess whether the model can adjust to its long-run equilibrium yearly after experiencing shocks. The coefficient error correction model β is the coefficient term of the error correction indicated in equation 16. The validity of the long-run equilibrium is measured by a negative and significant coefficient (β). The error correction term (residual) is the independent variable in the model. The Error Correction Model results are outlined below in Table 8.

Table 8 Error Correction Model (ECM) results

Dep. variable lnGDP	**Coefficient**	**Probability**
Constant	665.157	0.0001
ΔlnCAP	0.306	0.0225
ΔlnCPI	0.313	0.0789
ΔlnGC	-0.272	0.1244
ΔlnWE	-4.534	0.4568
ΔlnCTE	1.516	0.0219
ΔlnFE	-1.526	0.7115
ECT(-1)	-0.501	0.0029

R-squared	0.984
Adjusted R-squared	0.957

Durbin-Watson	1.888

4.3.5 Granger Causality Test

After conducting unit root tests and confirming stationarity and co-integration between the variables, the assumption is that there is causality in some of the variables. The fifth objective is to determine whether there is an existence of causality between agricultural exports and economic growth using the Granger causality test. Table 9 below is showing the results from the Granger causality test.

Table 9 Long-Run Causality Test

Sample: 1990 - 2020

Null Hypothesis	F-statistics	P-value
lnWE does not Granger Cause lnGDP	0.04382	0.9576
lnGDP does not Granger Cause lnWE	0.11132	0.8973
lnCTE does not Granger Cause lnGDP	0.04894	0.9528
lnGDP does not Granger Cause lnCTE	0.62655	0.5798
lnFE does not Granger Cause lnGDP	1.14339	0.4275
lnGDP does not Granger Cause lnFE	0.06768	0.9359

4.4 Summary

This chapter presented the findings of the research results. The study's first objective was to determine the trends of agricultural exports in Lesotho, in particular, wool, cotton, and fish. The first part provides the figures showing the trend of agricultural exports from 1990 to 2020. The descriptive analysis summarizes the data and provides an overview of the patterns from the data. The second, third and fourth and fifth objectives of the study are to determine the influence of wool, cotton and fish exports on economic growth in Lesotho as well as the influence of Capital, Consumer price index and government consumption respectively. This analysis achieved by conducting a series of tests: unit root tests, co-integration tests, regression and error correction model to tests to determine long-run and short-run relationships, is presented in this chapter. Lastly, the study's sixth objective was to examine whether wool, cotton and fish exports Granger cause economic growth in Lesotho. This objective used the Granger causality test. The following chapter in the study will discuss these results in detail.

5 DISCUSSION OF RESEARCH FINDINGS

5.1 Agricultural exports trends in Lesotho

The agricultural sector's productivity in Lesotho is influenced by the country's landscape, which consists of about 60 per cent rangelands, 9 per cent is arable land, and mountainous terrain as the remainder (Maile, 2001). In addition to a country's physical geography and natural resource endowments, Ng and Yeats (2003) indicate that factors such as the country's size, location and distance to main international markets influence industrialisation and growth and the ability to produce goods for exports. Agricultural output in Lesotho has also declined in recent years, leading to increased food and grain imports. While agricultural export products such as wool have been contributing towards household income for many decades since the 1970s, the share of agricultural expenditure in the total national expenditure based on the national budget has been declining over time with the share being lower than 2.5 per cent from 2008 to 2014 (Nhemachena, Matchaya and Nhlengethwa (2016). As a result, agricultural exports in Lesotho have been lower than 2 per cent of total exports for a decade (Aranas et al., 2018).

5.1.1 Wool Exports Trend in Lesotho

While an attempt has been made recently by the government to change the structure of the industry to allow the auctioning of wool from the Lesotho capital, Maseru, this move has been met by the farmers' resistance. The income trend of wool exports shown in figure 1 indicates that although the earnings have been mostly volatile during the 30 years between 1990 and 2020, US dollar gains have increased. The sharp decline from 2018 may be attributed to government regulations that banned the export of wool via BKB auctions by giving the monopoly to a local Chinese company. The protests by farmers and farmers associations led to the reversal of the regulations and an increase in the value of the earnings.

Wool has the largest share of agricultural exports in Lesotho and has been produced and exported in Lesotho since the 1960s. The country has had a long-standing relationship with the South African agents Boeremakelaars Koöperatief Beperk (BKB) who are responsible for marketing and auctioning the product to international buyers. Wool remains a vital product for rural households in particular. Mokhethi, Bahta and Ogundeji (2015) indicate that more than 28,000 smallholder producers as individuals or associations participate in the industry by sheering

their livestock (sheep and goats) before it is auctioned to international markets. This translates to more than 1.2 million sheep and 845,000 goats, where one sheep can yield three kilograms of wool (Ifad, 2019).

Lesotho wool exports are highly concentrated to South Africa, China and India. Although the amount of wool and mohair produced and exported during the 2012/2013 season was approximately 3 599 794 kilograms and 472 132 kilograms respectively, there is a need to diversify the destinations for wool export markets (Mokhethi et al., 2015). Factors that contribute to low quality of wool include overstocking, environmental degradation, and low productivity rates for sheep, resulting in low fleece weights (Phororo, 1996). This can affect wool exports earnings as the product is sold at lower prices at auctions. To improve the quality of greasy wool and mohair, there is a recommendation that a scouring plant be established in Lesotho to process the product and add value before it is auctioned (Mokhethi, et al., 2015).

6.1.2 Cotton Exports Trend in Lesotho

Figure 2 shows that cotton's value has been volatile since the sharp increase in revenues from the industry in 2004. This indicates that more investment is needed, and structural changes must be implemented to guard against external shocks in the future. Cotton is commonly grown, produced and exported in many countries in the Sub-Saharan region. Cotton is one of the few products that Lesotho exports as a value-added product, thereby increasing its overall earning potential and influence on the economy by affecting and stimulating other related industries and sectors. As a result, these economic linkages of the apparel and textile industry in Lesotho have increased the production and exporting of cotton to countries such as South Africa and the United States AGOA's backing. According to Molapo (2016), the apparel and textile industry has also contributed towards establishing vertical integration by having one of the biggest fabric mills in the region that can spin and dye cotton yarn and to produce denim fabric. In 2017 18 000 tons of yarn was made in Lesotho (Tralac, 2021). The yarn and denim are used by local firms that are manufactured into apparel and related products. It is also exported to countries such as Kenya, Madagascar and Mauritius.

6.1.3 Fish Exports Trends in Lesotho

The cultivation of fish in Lesotho is attractive due to its altitude, climate, water and rivers. While small scale fishing has been popular amongst locals in rivers across the country for various indigenous species for many years, other species have been introduced since 1912 to enhance the variety of the fish (FAO, 2009). Indigenous species include smallmouth and largemouth yellow fish and sharp tooth catfish, while the introduced species include rainbow and brown trout, common carp and bluegill sunfish. The most popular species for export is the rainbow trout grown and produced in the Lesotho Highlands Water Project (LHWP) in the Katse area, with initial production volumes being 300 tons (FAO, 2009).

The production volume of exported fish, with trout specifically, has increased significantly over the years but still maintains a low global export share. The global export value for trout is $600.74M, of which Lesotho's share of the global market is 0.5 per cent, at approximately $2.99M (Tridge, 2020). These values are significantly low compared to the top three trout exporters, Norway at 41.8 per cent of the global exports amounting to $251.22M, 11.3 per cent global share and $67.85M for the United Kingdom and 9.7 per cent share amounting to $58.17M for Sweden (Tridge, 2020). Nevertheless, there has been a significant rise in Lesotho's fish exports since 2009 with a decline in 2018 followed by an increase in 2019. Fish exports are expected to continue rising in Lesotho as the country diversifies into salmon, a product earmarked for expansion that has already attracted foreign investors. Below is a graph that depicts the trend in the fish exports sector in Lesotho for a 30-year period from 1990 to 2020.

5.2 Descriptive Analysis of the Data

The descriptive statistics are shown below in Table 1, which precede the econometrics analysis in the study. The study has focused mainly on the central tendency and the measures of dispersion of the data set by indicating the mean, minimum and maximum values, the standard deviation and the skewness of the distribution. Government consumption as a percentage of GDP has continued to increase in recent years while consumer price index is relatively low. The narrow tax base in the country has to be addressed by improving the unemployment rates. Government consumption must be directed towards programmes that create jobs and actively support the private sector.

5.3 Econometrics Analysis

The second, third, fourth, fifth and sixth objectives in the study are determined using econometrics analysis. The second, third, fourth and fifth objectives are to determine the long-run relationships between agricultural exports (wool, cotton and fish) as well capital, consumer price index and government consumption, on economic growth. There are various steps that need to be taken to achieve this: unit root tests, stationarity tests and co-integration tests and the regression test using ordinary least squares. The sixth objective, assessing the Granger causality, will be determined using Granger causality tests.

5.3.1 Unit Root Tests

In order to determine whether the time-series is stationary, unit roots using the Augmented Dickey-Fuller and the Phillips-Perron models were used. The test results are shown in Table 2 and 3, using the constant and the constant with trend formats. The stationarity of the time-series is crucial because the results of a non-stationary series become spurious. Through differencing, a non-stationary trend in the time series is removed.

The null hypothesis for a unit root indicates that there is a unit root in the time series, in other words, that the time series is non-stationary. The probability value (p-value) used is at the 5% (0.05) level.

The results in Table 2 indicate that most of the variables are non-stationary at the I(0) level. Table 3 shows the unit root test results using differencing to ensure that the non-stationary results shown in Table 2 are eliminated. Table 3 indicates that the time series is stationary by order of first difference.

5.3.2 Co-Integration Tests

Table 4 indicates that the entire recommended selection criterion has chosen 2 lag for VAR, and there are no conflicting results. On the other hand, literature shows that it is common for the maximum and the trace Eigenvalue statistics to provide inconsistent results. This was confirmed by the results of this study, where the trace statistics showed four co-integrating equations and the Eigenvalue statistics showed three co-integrating equations. This study chose the trace statistic. The results are shown in Table 5.

The trace test results in Table 5 indicate four co-integrating equations in the times series at the 0.05 probability level. This paper, therefore, rejects the null hypothesis that states that there is no co-integration and concludes that there are long-run relationships in the time series.

5.3.3 Long-Run relationships

5.3.3.1 The Influence of Wool Exports on Economic Growth

The influence of wool exports on economic growth in Lesotho is positive and is significant at 0.0502. Wool exports play an important role as agricultural exports that provide income for people living in rural areas. In recent years, however, there has been a decline in wool production attributable to many factors, including the wool system that is unable to produce the competitive quality of wool for the world market. Jordaan (2004) has shown that the major problems associated with the decline of quality wool exports in Lesotho are poor feeding, low reproduction rates, high mortality, and stock losses. Other factors include the need to establish a more efficient system that incorporates producer-owned cooperatives, privatization of shearing sheds and digitization of administrative and marketing processes.

Nevertheless, wool is an important commodity in Lesotho because it provides income to more than 28000 farmers who live mainly in the country's rural areas (Ifad, 2019). This makes a significant contribution to poverty alleviation and the rural economy. The structure of the wool industry does need improvement, however, to ensure that the wool quality is improved and sorted before exporting to South Africa for auctioning as these factors reduce the value of the wool (Mokhethi et al., 2015). Adding value to the raw product before the process of exporting is an avenue that needs exploration by the government of Lesotho for higher earnings.

5.3.3.2 The Influence of Cotton Exports on Economic Growth

Cotton exports in Lesotho have a positive relationship with economic growth and are highly significant at 0.0002. These results mean that economic growth increases by 33.63954 per cent for every 1 per cent increase in cotton exports. This has a considerable impact on Lesotho's economy in the long term and requires an increase in investment to spur further growth and exploit this relationship. Cotton has become increasingly popular in recent years due to its role in the value chain of the large apparel and textile manufacturing industry in Lesotho. The positive influence of cotton may be attributable to the value-added product in the form of yarn and

produced garments and not in its primary form. There is increasing concern over the sustainability of the manufacturing industry that relies mainly on the US market through the AGOA initiative that was extended to 2025 (Molapo, 2016). Factors such as the low value and demand of the EU market through agreements such as the Everything but Arms Agreement and the expiry of the Multi Fibre Arrangement (MFA) have contributed towards declining revenues. In the case of the MFA, the pressure on Lesotho emanates from the highly competitive nature of the industry created by other low-cost producers (Hlabana, 2007). Therefore, for cotton to continue having a significantly positive effect on economic growth, the government of Lesotho must invest further into the industry and ensure that more Basotho have career progression opportunities through higher positions in firms to transfer skills and provide the necessary support for Basotho to own and operate their own firms.

5.3.3.3 The Influence of Fish Exports on Economic Growth

The long-run relationship of fish exports and economic growth is negative, meaning that a 1 per cent increase in fish exports results in a decrease economic growth by approximately 2.64852 per cent. The reasons for this inverse relationship may be the low yields of fish production in Lesotho despite increasing demand for fish such as trout and yellowtail and the efforts of investment in the sector. Trout produced commercially in the highlands and the lowlands based on the two zones' different climate and altitude. The highlands region produces trout through the Lesotho Highlands Water Project close to the Katse area. The success of the project has led to the export of trout to countries like Japan and South Africa. This has also attracted more investors in the sector for salmon farming. The total yield per year for the sector is approximately 32 tonnes compared to the 200 to 300 tonnes per year that the sector can produce (commonwealth, 2020). This suggests that a lot of work needs both the private and the public sectors to ensure that Lesotho's fish industry grows to its full potential.

5.3.3.4 The Influence of Government Consumption on Economic Growth

Despite the growth of GDP in recent years as well as the high government expenditure, the country still faces fiscal challenges that are linked with the narrowing income from the Southern African Customs Union (SACU). High unemployment rates further amplifies the challenges and drives the government towards borrowing.

5.3.3.5 The Influence of Gross Fixed Capital Formation on Economic Growth

The gross domestic fixed capital formation should positively affect economic growth due to the multiplier effect of investments in the economy. Sekantsi and Kalebe (2015) found that investments in Lesotho are necessary for economic growth and concluded that the government of Lesotho should facilitate capital accumulation to achieve higher growth rates. However, the results in this study are inconsistent with the expectations. They have shown that CAP has a negative relationship with the economy in Lesotho, although the result is insignificant at 0.9534. This means that there are insufficient investments in Lesotho, and the investments that do exist do not positively affect the economy. Most banks in Lesotho are foreign owned which means that most of the investments in the country emanate from FDI. In addition, there is a lack of forward and backward linkages in the manufacturing and diamond mining industries, particularly as the biggest export commodities in Lesotho. While there has been a large investment in these sectors by mostly foreign firms that have contributed to poverty and unemployment alleviation, most of these firms use foreign bank accounts. The proceeds from these sectors do not trickle back into the economy.

5.3.3.6 The Influence of Consumer Price Index on Economic Growth

The consumer price index can negatively affect economic growth. The increased cost of goods reduces demand and consumer spending, which ultimately hinders growth. As part of the Common Monetary Area (CMA) agreement, Lesotho does not have its own monetary policy but is dependent on the inflation targeting by the South African Reserve Bank (SARB). The target range for CPI by SARB ranges from 3 per cent to 6 per cent. According to a study by Seleteng (2005), the threshold capped at 6 per cent is too low to have a positive impact on the economic growth in Lesotho. This study found that the ideal optimal inflation rate conducive to the economic growth in Lesotho is 10 per cent. Due to the tough economic times, a large number of people remain unemployed and the employed population chooses to save their money and only spend on essential goods.

5.3.4 Error Correction Model

Table 8 shows that the variables are stationary at first difference I (1) due to the negative coefficient of the error correction term, also significant at 5 per cent. This also means that in the

short-term, the model can adjust to long-run equilibrium after experiencing shock and the speed of adjustment towards equilibrium is -0.501104. The adjusted r-squared statistic shows a 0.9573 fit of the model, suggesting that the model can be considered good by approximately 95 per cent.

5.3.5 Granger Causality Test

Based on the results of the Granger causality test in Table 9, we reject the null hypothesis that states that wool exports do not Granger Cause a change in GDP based on the p-value of 0.957. Conversely, we reject the null hypothesis that states that GDP does not Granger Cause a change in wool exports at the 0.897 level. The null hypothesis stating that cotton exports do not Granger cause a change in GDP is also rejected at the 0.952 level and the null hypothesis stating that GDP does not Granger cause cotton exports is also rejected. The null hypothesis stating that fish exports do not Granger Cause a change in GDP is rejected as well as the null hypothesis stating that GDP dose not Granger cause fish exports. In other words, all the null hypotheses are rejected and the study concludes that there is bidirectional causation between GDP and all three agricultural exports.

These results support the export-led growth hypothesis, showing that exports lead to economic growth in Lesotho. A focused strategy on manufacturing, increasing productivity and the quality of output to become attractive to international markets particularly for wool are needed. Increasing domestic demand in fish may also have a positive effect on the quality of the products as the market becomes more competitive.

6 SUMMARY, CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS

6.1 Summary

This study aimed to evaluate the influence of wool, cotton, and fish on the economic growth of Lesotho. These three agricultural commodities generate the most revenue from agricultural exports; however, they only constitute less than 50 per cent of total exports in the country. The textile and apparel sector is the biggest exporter in Lesotho, with over 40 per cent of products exported to South Africa and the United States through the AGOA that came into force in 2000. This agreement has benefitted the sector enormously, with more than 40 000 people employed in the sector. However, the concentration of exports in this sector can be detrimental to the Lesotho economy if the AGOA expires after 2025. Therefore, it is crucial for the country to diversify its exports and invest in other sectors of the economy to foster economic growth. The majority of the population in Lesotho live in the rural areas and depend on agriculture for their livelihoods. Export promotion strategies targeting agriculture would enhance economic activity and support farmers in their plight for food security.

The export-led growth hypothesis gained popularity amongst researchers in the 1970s and has had mixed results over the years. Nevertheless, other researchers have argued that the industrialisation process would be more beneficial to Africa.

However, as a least developed country, Lesotho's industrialisation is minimal. The agricultural sector exports less than 10 per cent of total exports. Wool and fish is exported in their primary form with minimal value-added. Nevertheless, agricultural exports play a pivotal role in poverty reduction. For instance, 28000 farmers directly gain income from wool exports.

6.2 Conclusions

This study aims to determine the influence of wool, cotton, and fish on the economic growth in Lesotho. The study analysed data dating back 30 years from the period of 1990 to 2020. The study examined the long-run and short-run relationships between variables and the causal effects of the variables on economic growth using the Johansen co-integration model, error correction model and the Granger causality test. The study results showed that wool and cotton have a positive and significant influence on economic growth while fish has a negative effect both in the long run and

short run. In addition, the study found bilateral causation between economic growth and wool, cotton and fish exports.

Agricultural exports are still below 10 per cent of total exports in Lesotho but can grow. The export products that have the highest earning values need structural changes and investment. For example, the decline of quality wool exports in Lesotho emanate from poor feeding of livestock, low reproduction rates, high mortality and stock losses. Other factors include the need to establish a more efficient system that incorporates producer-owned cooperatives, privatization of shearing sheds and digitization of administrative and marketing processes. Cotton exports can grow if the apparel and textile sectors become more inclusive. Similarly, fish exports need diversification and investment to include the production of other species.

6.3 Limitations

This paper conducted a study to evaluate the influence of wool, cotton and fish on agricultural exports in Lesotho. The methodology comprised unit root tests, Johansen co-integration test and the Granger causality test. Some researchers have criticized the components of this methodology. The Granger causality test has a limitation for omitting independent variables analysed in earlier regression models, leading to incomplete specifications. Secondly, the Augmented Dickey-Fuller (ADF) unit root test has been criticized for not considering structural breaks and non-linearity. Furuoka (2018) used the ADF with structural breaks and the Fourier ADF with structural break test as well as a comparative analysis of three causality tests and a rolling causality test procedure to mitigate these limitations. Other limitations of the study include inaccurate data that exists for a limited time. Data for longer periods is not available and therefore limits the analysis of long-run relationships.

6.4 Recommendations

Lesotho's exports are concentrated in the apparel and textile sector, posing a threat to the economy if AGOA is terminated. Diversification and value-added of exports are critical, and agricultural exports, particularly wool, cotton, and fish, can contribute towards economic growth. However, investment and structural changes are essential. For instance, the structure of the wool sector needs to factor in the need to improve the quality of the product by sorting it before exporting. On the other hand, cotton exports have value-added, but there is no multiplier effect

emanating from the apparel and textile sector. Negotiations with Asian investors that allow Basotho with career progression opportunities through higher positions in firms and skills transfer are essential to ensure the expansion of the sector where local firms can emerge and find the necessary support.

The paper recommends an increase of the national agricultural budget. Minimal interference of the government in the wool sector is paramount. An assessment of the departments of trade and planning using McKinsey's 7S model is necessary to improve the efficiency regarding the trade strategies of the country. An advisory committee for agriculture with an oversight mandate is necessary. The key objective of this committee is to ensure that there is growth in the agricultural sector. The mandate can include strategic functions for implementing essential structural changes in the industry, forging key partnerships and alliances with other stakeholders for funding and support, exploring innovative technologies that can improve the sector and, ultimately, the quantities and quality of exported agricultural products.

The government needs to support the private sector to create more businesses that produce quality goods to increase domestic demand and the quality of exported goods. Government expenditure directed towards creating business incubation initiative particularly for young unemployed youth to boost the economy and tax base is essential.

There is a need for more research on determining whether the economy of Lesotho should focus solely on an export-led growth, domestic demand led growth strategy or both. This study did not include government consumption expenditure, consumer price index and gross capital fixed formation in the granger causality test. Further studies could provide this analysis, which would be able to compare these components with the causal relationship between exports and economic growth to determine the best strategy for the country to follow.

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APPENDICES

Appendix 1.1: Bio of the researcher including declaration of interest in the research and funders, if any

The researcher is a law graduate with qualifications from the University of Cape Town and the National University of Lesotho. She has an interest in governance and policy issues affecting the African continent in general and Lesotho in particular.

Appendix 2.1: Ethic documentation

MBA Project Proposal Review – Research Article
Note: this form is to be used for Research Articles only. Separate forms must be used for Consultancy Projects, Business Venture Proposals and Social Entrepreneurship Projects.

Student name: Mokhothu Thato Ramohlanka	**Proposed title: Evaluating the influence of wool, cotton and fish exports on economy growth in Lesotho**
Student number: 448245	

Criterion	Comment and / or Specific Recommendations / Improvements Required
Academic journal has been nominated; structure, headings and style consistent with the nominated journal	OK.
Appropriate research problem and sub-problems, include a verb at or near the beginning and align with each other	OK.
Integrated literature review based on problem and sub-problems, citing a minimum of 20 peer-reviewed academic journal articles	OK.
Hypotheses, propositions or research questions arise directly from the literature review, clearly related to the applicable sub-problem and stated at end of the relevant literature section	OK.
Research methodology section detailing research design, population and sample, participants, research instrument (survey, interview guideline, etc.) and method of analysis	OK.
APA 6th referencing including in-text citations, reference list and alignment between the two	OK.

Appropriate academic style including level of formality, formatting, grammar and spelling; figures and tables clearly legible and in the style of the nominated journal	OK.
Additional comments and instructions: **Ethics clearance application approved**:	-The research proposal is approved. -The ethics clearance application form is approved.

Decision	
Proceed with Supervisor	**X**
Revise and re-submit	

	Panel Chair	**Panel member**	**Panel member**	**Panel member**
Name:	**Dr Jenika Gobind**	Dr Manamela	Peter Mmari	Chantal Banga
Signature:	J	M	P	

Note: this form is to be returned to the student immediately after the panel session.

Proposed Internal examiner†:	
Supervisor name: Not provided.	**Panel Date: 11 November 2020**

† For completion by the research office only.