



**ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
INSTITUTE OF AGRICULTURE AND DEVELOPMENT STUDIES**

**IMPACT OF LIVE ANIMAL PRODUCTION AND TRADE ON
ECONOMIC GROWTH OF COMESA MEMBER COUNTRIES**

**BY
BINYAM KASSA ENGIDASEW
ID Number: SGS/0483/2010A**

**JULY, 2019
ADDIS ABABA, ETHIOPIA**

**IMPACT OF LIVE ANIMAL PRODUCTION AND TRADE ON
ECONOMIC GROWTH OF COMESA MEMBER COUNTRIES**

BY

BINYAM KASSA ENGIDASEW

ID Number: SGS/0483/2010A

**A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF
GRADUATE STUDIES, INSTITUTE OF AGRICULTURE AND
DEVELOPMENT STUDIES IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS OF MASTER OF SCIENCE DEGREES IN
DEVELOPMENT ECONOMICS.**

JULY, 2019

ADDIS ABEBA, ETHIOPIA

ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
INSTITUTE OF AGRICULTURE AND DEVELOPMENT STUDIES

**IMPACT OF LIVE ANIMAL PRODUCTION AND TRADE ON
ECONOMIC GROWTH OF COMESA MEMBER COUNTRIES**

BY
BINYAM KASSA ENGIDASEW

APPROVED BY BOARD OF EXAMINERS

Wondimagegn Chekol (Ph.D.)
Dean, Graduate Studies

Signature

Maru Shete (Ph.D.)
Advisor

Signature

Wondemagegn Mesfin (Ph.D.)
External examiner

Signature

Paulos Asrat (Ph.D.)
Internal examiner

Signature

TABLE OF CONTENTS

ACKNOWLEDGEMENT	iii
ACRONYMS AND LIST OF ABBREVIATIONS.....	iv
LIST OF TABLES	v
LIST OF FIGURES	vi
ABSTRACT.....	vii
CHAPTER 1	1
1. INTRODUCTION	1
1.1 Background of the study	1
1.2 Statement of the Problem.....	2
1.3 Research Questions	5
1.4 Research Objective	6
1.4.1 General Objective	6
1.4.2 Specific Objectives	6
1.5 Research Hypothesis.....	6
1.6 Significance of the study.....	7
1.7 Scope and Limitations of the Study	7
1.8 Organization of the thesis	7
CHAPTER 2	8
2. LITERATURE REVIEW	8
2.1 Introduction.....	8
2.1.1 Globalization and International trade.....	8
2.1.2 International trade	9
2.1.3 Regional Economic Integration	9
2.2 Theoretical Review	15
2.2.1 Free trade and economic integration.....	15
2.2.2 International Trade and Economic Growth.....	15
2.3 Empirical Review.....	17
2.3.1 Importance of Livestock in East Africa	17
2.3.3 Trade and Economic Growth in COMESA Member Countries	18
2.3.3 Trends in Economic Integration.....	19
2.4 Conceptual Framework	20
CHAPTER 3	21
3. RESEARCH METHODOLOGY.....	21
3.1 Research Approach and Design	21

3.2. Variables, Data Sources and Data Collection Methods	21
3.2.1 Data Sources and Collection Methods	21
3.2.2 Variables Description.....	21
3.3. Population and Sampling	22
3.3.1 Description of the Study area.....	22
3.3.2 Population of the Study.....	24
3.3.3 Sampling	24
3.4 Method of Data Analysis	24
3.4.1. Analysis Tools	24
3.4.2 Model Specification and Hypotheses.....	24
3.4.3. Post Estimation Tests	26
CHAPTER 4	28
4. RESULT AND DISCUSSION	28
4.1 Descriptive Analysis of Livestock and Products Trade in COMESA	28
4.1.1 Socio-economic description of the study area	28
4.1.2 Livestock and Products Balance of trade in COMESA Member Countries	29
4.1.3 Trends in livestock and products international trade in COMESA.....	30
4.2. Relationship between COMESA FTA membership and live animal and products trade	31
4.3 Estimation Results for Economic Growth and Livestock Commodity Trade variables	32
4.3.1 Post-estimation test results.....	32
4.3.2. Estimation Results.....	34
CHAPTER 5.	37
5. CONCLUSION AND RECOMMENDATION	37
5.1 Summary of findings.....	37
5.2 Conclusion	37
5.3 Recommendations.....	38
REFERENCES	39
Annex 1. Post Estimation Tests	42
Annex 1.1 Unit Root Test Results	42
Annex 1.2. Distribution Normality Test	44
Annex 1.3 Test for multicollinearity.....	47
Annex 1.4 Hausman Specification Test.....	47
Annex 1.5 Hetroscedasticity test.....	47
Annex 1.6 Estimation results	48
Annex 2. Livestock Commodity Definition.....	49

ACKNOWLEDGEMENT

First of all I would like to thank the Almighty God for His blessings that make this study a reality. I would also like to pass my heartfelt gratitude to my advisor Dr. Maru Shete for his unreserved professional support and brotherly advices.

I also thank my beloved wife Mekdes Asfaw and our children Makda and Zemikhael for their patience and support during the course this study and the entire program. My appreciation also goes to my parents and siblings for covering my role in the family during my absence for class and research works.

I am also indebted to all my class mates of Development Economics class of 2019, especially Tedla Abebe, Sefinew Ayele, Medhanit Gebremedhin, Yohannes Mehari and Chere Mulat for their support during course work and this research work. It would have been harder to catch up with this new field of study for me without your support in group studies and encouragement. Thank you all!

ACRONYMS AND LIST OF ABBREVIATIONS

CCIA	Common Investment Area
CEMAC	Central African Economic and Monetary Community
CENSAD	Community of Sahel-Saharan States
CFTA	Continental Free Trade Area
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
ECCAS	Economic Community of Central African States
ECCAS	Economic Community of Central African States
ECOWAS	Economic Organization of West African States
EU	European Union
FAO	Food and Agriculture Organization, of United Nations
FTA	Free Trade Area
GDP	Gross Domestic Product
IGAD	Inter-Governmental Authority on Development
NIID	Normally, independently and identically distributed
OPEC	Organization of Petroleum Exporting Countries
PTA	Preferential Trade Area
REC	Regional Economic Communities
RIA	Regional Integration Agreements
SACU	Southern African Customs Union
SACU	Southern African Customs Union
SADC	Southern African Development Community
SSA	Sub-Saharan Africa
UAE	United Arab Emirates
UNCTAD	United Nation Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
WAEMU	West African Economic and Monetary Union
WB	World Bank

LIST OF TABLES

Table 2.1 Trends in EU Animal products exports to and imports from Sub-Saharan Africa, 2013 – 2017.....	18
Table 3.1 Variables description, data source and expected association.....	22
Table 3.2 Geographic, economic, demographic and livestock resource base of COMESA member countries	23
Table 4.1 Mean values of production and trade of agriculture and live animal (1991 – 2018)	28
Table 4.2 Pearson’s Correlation between trade, economic growth and FTA membership to COMESA	32
Table 4.3 Growth model estimation results	34

LIST OF FIGURES

Figure 2.1 Conceptual Framework of the Study	20
Figure 4.1 Trade Balance of live animal over 1991 -2017 in million USD	29
Figure 4.2 Animal products balance of trade in COMESA (in million USD, 1991-2017).....	30
Figure 4.3 Mean imports and export values of live animal in COMESA member countries	30
Figure 4.4 Trend in animal products import and export in COMESA member countries	31

ABSTRACT

Globalization is the increasing integration of national economies into expanding international markets and viewed as instrument for economic growth, development and emancipation. It has many dimensions of which its trade and growth dimension are the key themes of the current study. Recently African nations are moving towards a continental free trade area establishment in addition to the previous regional integrations such as ECOWAS, SADC and COMESA. A number of reports are available with regards to trade and economic growth in light of such preferential trade areas that presented varying views from different dimensions of regional integration. This study was conducted to assess the impact of live animal and animal products international trade on economic growth and to describe the association between membership to FTA of COMESA and live animal and products trade in member nations. A secondary panel data from 11 COMESA member states of which two are non-FTA members was used to model the economic growth impact of livestock production, live animal export and animal products import and export, data ranging between 1991 and 2018. FGLS was deployed to correct data problems and model the impact of independent variables on GDP, with overall $R^2=0.8389$. Among the explanatory variables livestock production, live animal import, animal product import and export were significant at 99% confidence interval. Correlation results showed that there is positive correlation between FTA membership and economic growth as well as live animal and products trade. It was concluded that livestock commodities trade has positive impact on economic growth and the FTA membership improves trade in livestock commodities in COMESA region. Further research is recommended on the export destinations and commodities to fill the knowledge gap in livestock intra-regional and non PTA trade.

Key words: international trade, economic growth, COMESA, FTA, livestock commodities

CHAPTER 1

1. INTRODUCTION

1.1 Background of the study

The amalgamation of state economies into an international economic system has been one of the most central developments of the last century. This process of integration, often called globalization, has emerged in a remarkable growth in trade between countries. Globalization includes flow of goods and services across borders, international capital flows, reduction in tariffs and trade barriers, immigration, and the spread of technology and knowledge beyond borders. Over the last couple of centuries the world economy has experienced sustained positive economic growth, so observing the dynamics of trade in relation to GDP offers an interesting perspective towards understanding development. In the current global economic system, countries exchange not only final products, but also intermediate and primary inputs. This creates an intricate network of economic interactions that cover the whole world (Ortiz-Ospina, *et al.*, 2018).

As to what constitutes to international trade, global transactions include goods (physical products that are physically transported across borders by road, rail, water, or air) and services (immaterial commodities, such as tourism, financial and legal services). Many traded services make merchandise trade easier or cheaper—for example, shipping services, or insurance and financial services. Trade in goods has been happening for millennia; while trade in services is a relatively recent phenomenon. World Bank (2018) described the average share of service trade in the world has recently reached 23.5% the balance recorded for goods. The corresponding figures for the Sub-Saharan Africa region is 18.3%

Fouquin & Hugot, (2016) argued that bilateral trade is becoming increasingly common by considering all pairs of countries that engage in trade around the world. The report showed that in the majority of cases, there is a bilateral relationship, i.e., most countries that export goods to a country, also import goods from the same country. It also asserted that the South-South trade is becoming increasingly important.

Several studies addressed the impact of international trade on economic growth of a country. The findings of these studies indicate that international trade i.e. exports and imports has a statistically significant positive impact on economic growth (GDP) of a country. A study that examined the impact of export composition on economic growth, indicated that not all exports contribute equally to economic growth. Many developing countries depend on exports of primary products, which are subject to disproportionate price fluctuations and this category of exports had negligible impact on economic growth, while manufactured exports had a positive and significant effect on economic growth (Kim & Lin, 2009).

1.2 Statement of the Problem

Regional trade blocs are recently promoted globally as drivers of economic growth. In general free trade facilitations in regional blocs are well documented by previous studies from developed and developing regions. Most developing countries are members of regional integration agreements (RIAs). From the viewpoint of the efficiency of resource allocation, however, RIAs between developing countries (so-called South– South agreements) are likely to hurt member countries because low-priced imports from non-partner countries are replaced with higher-priced products from partner countries. The African continent is recently moving towards a continental free trade area, in addition to strengthening the existing regional blocs such as ECOWAS, SADC and COMESA.

Established in 1994, COMESA is one of the largest blocs in Africa with vast population and area coverage. Currently it has 21 member countries. In October 2000, nine of the member countries (Djibouti, Egypt, Kenya, Madagascar, Malawi, Mauritius, Sudan, Zambia and Zimbabwe) signed the free trade area (FTA) agreement and eliminated their tariff on COMESA originating products. However, some members are still not FTA members of this regional bloc, namely Ethiopia and Eritrea. The region is composed of nations with varying economic base and geographic location that determines the nature of traded goods and services.

Even though the agriculture sector contributes the least to the region's economy, it remains the most important in creating employment opportunities. According to Upton (2014), agriculture provides a livelihood for more people than any other industry in the world. Growth in agricultural production and productivity is needed to raise rural incomes, to support the increasing numbers

dependent on the industry and to meet the food and raw material needs of the faster growing urban populations. Enhancing agricultural productivity contributes to industrial growth by providing cheap labor, capital investment, foreign exchange and markets for manufactured consumer goods.

Agriculture contributes to 20–60% of the Sub-Saharan Africa (SSA) Gross Domestic Product (GDP) by mobilizing up to 80% of labor force and constituting 50–90% of export share (Cleaver, 1985). As an integral part of the agriculture sector, livestock industry contributes about 1.2 percent of the global GDP—as much as 5 percent for some countries—and is growing by about 2.5 percent per annum (Iimi, 2007). The contribution of live animals and their products to the agricultural economy accounts for 40%, excluding the values of draught power, manure and transport of people and products (Winrock International, 1992) in Ethiopia, whereas its contribution is between 18 and 88 % of the net value of agricultural production in East Africa (Noula *et al*, 2013).

In many of the poorest countries, livestock farming is one of the important industries to develop for not only economic growth but also poverty reduction and environmental protection. The livestock industry contributes about 1.2 percent of the global GDP—as much as 5 percent for some countries—and is growing by about 2.5 percent per annum (Iimi, 2007). IGAD (2013) estimates that Livestock and their products constitute a fifth of Ethiopia's exports, but about half of these exports are not recorded or officially recognized because they are produced by the informal cross border trade in live animals. These unofficial exports contribute to the welfare of Ethiopians by financing the importation of a wide range of consumer goods, including necessities such as clothing and staple food items.

International trade is important to an exporting country as it provides an important source of revenue for the country. The trade creates employment in rural and regional areas - jobs for ancillary suppliers and services such as livestock agents, transport operators, exporters, and shipping companies. It also benefits feedlot operators, fodder and chemical suppliers, veterinarians, sale yards, stockmen, port authorities, and the finance and insurance sectors. On the other hand, trade in live animals is important to an importing country to acquire high quality breeding stock, acquire feeder stock and to acquire livestock for slaughter. For several African countries, trade in live animals is important, although much of this involves informal, intraregional flows or sales to the Middle East market. Notable is Somali livestock exports to Middle East

countries of Oman, Saudi Arabia, Yemen, and the UAE among other countries. Livestock exports are low in many African countries due to export limiting transboundary animal diseases and under developed export infrastructure (Kenya, undated).

Most of African nations have economies based on agriculture and internationally trade primary products. Trade in similar goods between similar countries is welfare improving (Bjornskov, 2005). Sub-Saharan Africa exports to EU is decreasing; bovine meat at 22.5% and raw hides and skins at 3.3% between 2016 and 2017 (EU, 2018). Livestock and products trade within and outside of the COMESA region has significant contribution to economic growth in the region. Livestock provided 45% of agricultural GDP in 2008 according to IGAD (2013) estimates that included their contribution to crop production in terms of draught power. The hides, skins and leather industry in the East African region is one of the key agricultural sub-sectors with a high potential towards commodity development that addresses pertinent issues of socio-economic importance and positively impact on rural development, creation of wealth and employment (IGAD, 2013).

According to Upton (2014) livestock and livestock products are estimated to make up over half of the total value of agricultural gross output in the industrialized countries, and about a third of the total in the developing countries. The global importance of livestock and their products is increasing as consumer demand in the developing countries expands with population growth and rising incomes. This growth in consumption is reflected in improvements in the average human nutritional status due to the intake of animal protein. The resultant changes have been dubbed ‘the next food revolution’ and the growth in developing country consumption of animal products is predicted to continue at least until 2020.

Arega (2011) reported on the impacts and determinants of agricultural exports from Sub-Saharan Africa to the West that highlighted both demand and supply side variables affecting agricultural trade. Goodhope (2014) reported that trade liberalization has a direct positive implication for national economic development and emancipation, particularly in Nigeria within the ECOWAS sub region. Similarly, Sunge and Mapfumo (2014) called for the coming into effect of the establishment of the COMESA-EAC-SADC FTA following their study on intra-regional trade agreements effect on trade flows in Zimbabwe. Mamo (2014) examined the trade linkages among the member countries of the COMESA and the extent to which the introduction of the COMESA

common external tariff liberalized their trade regimes and reported a negative association between the region's external tariff and trade. In light of these reports about the relationship between free trade and economic growth little has been done to document the impact of specific commodities in the economy of nations within the COMESA bloc.

Even though the contribution of live animals and their products to the agricultural economy accounts for 40%, excluding the values of draught power, manure and transport of people and products (Winrock International, 1992) and 18 and 88 % including the draught power (Behnke and Fitaweke Metaferia, 2013), its impact on the economic growth of COMESA member nations has not been documented. In addition, the difference between FTA member and non-FTA member countries economy and livestock commodities trade is not yet documented. Should these non-FTA member states liberalize or restrict their international trade in the context of agricultural commodities trade requires detailed knowledge on specific impacts of commodities trade on their economic growth.

1.3 Research Questions

This research work tries to address the following questions;

1. What is the size of livestock sub-sector in the agricultural sector in the COMESA member countries?
2. What is the trend in the trade of live animal and animal products in the COMESA region?
3. Does the FTA of COMESA affect live animal and animal products trade?
4. What does the balance of trade in live animal and animal products trade in COMESA region?
5. Does production of livestock and its products trade have any impact on the growth of economy in the COMESA region?

1.4 Research Objective

1.4.1 General Objective

The main objective of this paper is to assess the impact of livestock and products trade on economic growth in COMESA region.

1.4.2 Specific Objectives

- ⊕ To describe the size of live animal and products trade in the COMESA regional bloc.
- ⊕ To describe the association between membership to FTA of COMESA and live animal and
- ⊕ To assess the effect of live animal and animal products international trade on economic growth products trade in member nations

1.5 Research Hypothesis

The general working hypothesis of this study is that livestock production and trade has significant impact on economic growth of COMESA member countries. Its direct impact is through addition of value within the countries' economy and additional earnings from export of livestock commodities in the preferential trade area of COMESA. The indirect impact is through creation of employment opportunities and improved human capital through better nutrition. In addition it is hypothesized here that FTA membership is correlated with economic growth and improved live animal and products international trade in COMESA region. The specific hypotheses of this study are the following;

1. Impact of livestock production and commodity trade on economic growth

H₀: livestock production and commodity trade has no economic impact in COMESA region

H₁: livestock production and commodity trade has economic impact in COMESA region

2. Correlation between COMESA FTA, economic growth and livestock commodity trade

H₀: there is no association between COMESA FTA and economic growth and trade

H₁: there is positive association between COMESA FTA and economic growth and trade

1.6 Significance of the study

There is a gap in the knowledge of livestock and products international trade in the preferential trade areas in Africa, especially in COMESA. This study is significant in that the results will contribute to regional and national policy makers' information base on the significance, status and prospects of regional livestock and products trade and highlights the importance of FTA membership towards improved export performance in the agriculture sector.

1.7 Scope and Limitations of the Study

This study has geographic boundary within African continent, specifically Burundi, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Rwanda, Sudan and Tunisia which are members of the COMESA regional bloc. It tried to address the relationship between economic development and livestock commodities international trade at national and regional level using econometric analysis of panel data for the time elapsed between 1991 and 2018.

Data used for the analysis of the association between economic growth and livestock commodity trade was sourced secondary data from FAOSTAT and the World Bank repositories. Even though these are official sources of secondary data for economic variables, the study has identified limitations in terms of data reliability as secondary data usually make estimates for missing data. In addition, macro panels have limitations cross-country dependency (i.e. correlation between countries). Therefore the analysis and conclusions may be limited to the information that can be extracted from such quality data.

1.8 Organization of the thesis

This study is structured in to five chapters. The second chapter discusses about the theoretical review, empirical review and conceptual frameworks regarding on the relationship of livestock regional trade and economic growth. The third chapter is about the methodology of the study which contains the research design, the data type and source method of data analysis, model specifications, and definitions of variables. The fourth chapter presents the result and discussions of the study and finally the fifth chapter is about summery of key findings, conclusion and recommendations drawn out of the study.

CHAPTER 2.

2. LITERATURE REVIEW

2.1 Introduction

2.1.1 Globalization and International trade

There are several definitions of globalization such as the increase of financial integration between different countries of the world, as well as the simple definition of the increase in the degree of international trade between countries over time (Mazumder, 2017). At microeconomic level, globalization is the continuing development of a firm's international involvement concerning geographical markets, products, management, resources (labor, raw materials etc.) for the purpose of optimization of the international market opportunities and threats (Imam, *et al.* 2011). From economic development perspective Todaro and Smith (2012) defined globalization as the increasing integration of national economies into expanding international markets.

Hitt (2006) opines that globalization is the spread of economic innovation around the world and the political and cultural adjustments that accompany this diffusion. He adds that globalization provides greater opportunities for firms to compete in the new competitive landscape. Umar (2004) sees globalization as the interconnection and interdependence between all parts of the world, particularly at all levels of economy and communications, such that former national barriers to the movement of information, finance, goods, services and entrepreneurship are being drastically reduced and everybody now has to compete with everybody in what has now become a global village and simple global market.

Rochester (2003) is of the belief that globalization is a process of change in which the world's countries and their economies are increasingly integrated as a function of rising cross-border economic and other activities. He further argues that, globalization has led to increase in interest in the areas of international marketing, trade, transportation, communication, financial exchange, nuclear targeting around the world, etc. In all its ramifications, globalization is viewed as instrument for economic growth, development and emancipation. It is far from a unique concept and can have multiple dimensions and applications. It is one of the greatest strategic challenges for all economic sectors and has increased significantly over the last few decades. Despite fluctuations in economic cycles in many parts of the world globalization will likely continue.

2.1.2 International trade

Traditional models of international trade imply that trade from an economy that moves from autarky to one that participates in global trade will increase the value of total production in that economy (Lopez, 2005). Lopez (2005) further adds that international trade may generate improvements in the level of output, but it doesn't necessary induce any additional economic growth in an open economy, which means, what international trade can do is improve the allocation of resources in an economy.

Global trade helps nations to fulfil their goods and services requirements that they are not endowed with but require for their production and sustaining of lives of their people. Raw materials for manufacturing, inputs for agriculture and food production, gas oil for energy production and precious metals for luxuries and aesthetic values are among the thousands of commodities on the global list of trade (Hamburg University, 2009).

The positive side of free trade include; increased economic growth, more dynamic business climate from competition, lowered government spending from cutting subsidies, foreign direct investment and expertise and technology transfer. The other side of free trade are; increased job and products outsourcing, theft of intellectual property in developed economies, crowding out domestic industries in traditional emerging economies, reduced tax revenue, destruction of native cultures and degradation of natural resources (Amadeo, 2019). As a solution to the downsides of free trade the author has put inclusion of regulations within trade agreements that protect against the disadvantages than protectionism.

2.1.3 Regional Economic Integration

Economic integration is the unification to various extent of the economies and economic policies of two or more nations in a region (Todaro and Smith, 2012). It can also be seen as an alliance of nations that reduces or eliminates trade barriers and movement of resources among its members (Nafziger, 2006). Economic union is the full integration of two or more economies into a single economic entity, such as the European Union (Todaro and Smith, 2012). Nafziger (2006) further defined economic union as a regional integration that removes trade barriers among members, retains common trade barriers against nonmembers, allows free labor and capital movement among member states, and, unlike a common market, and unifies members' monetary and fiscal policies.

Regional trading bloc is an economic coalition among countries within a geographic region, usually characterized by liberalized internal trade and uniform restrictions on external trade, designed to promote regional economic integration and growth (Todaro and Smith, 2012). In the same manner, the authors defined Customs union as a form of economic integration in which two or more nations agree to free all internal trade while levying a common external tariff on all nonmember countries. COMESA defined customs union as a merger of two or more customs territories into a single customs territory, in which customs duties and other measures that restrict trade are eliminated for substantially all trade between the merged territories. The territories, in turn apply the same duties and measures in their trade with third parties (COMESA, 2019).

Many continents of the world had formed several regional integrations since the formation of the General Agreement on Tariffs and Trade (GATT), the current World Trade Organization (WTO), in 1947. To highlight a few, the European Union (EU), the North American Free Trade Area (NAFTA), the Association of South East Asian Nations (ASEAN), and the Southern American Southern Common Market (MERCOSUR) are some of the known and successful regional agreements (Mamo, 2014).

Most developing countries are members of regional integration agreements (RIAs). From the viewpoint of the efficiency of resource allocation, however, RIAs between developing countries (so-called South– South agreements) are likely to hurt member countries because low-priced imports from non-partner countries are replaced with higher-priced products from partner countries. World Bank proposes a solution to this problem for member countries to lower their external trade barriers, thereby reducing the inefficient displacement of non-partner country imports: by lowering external trade barriers sufficiently, a harmful RIA can be turned into a beneficial one. The effects of an agreement among developing countries are likely to be asymmetric, with the poorer member countries losing at the expense of higher-income members (World Bank, 2000).

The growing interest in regional economic cooperation in Africa has prompted African countries to form trading blocs or economic communities to cooperate in eliminating barriers to engagement, and the flow of products, services, capital, and people. They also wish to reduce the continent's dependence on industrialized economies for a greater part of their international trade. Prior to the

explorations of Africa by European merchants in the 15th century, the continent's traders and rulers had established trade links with the Indian Ocean region, western Asia, and the Mediterranean world. Internally, there were local exchanges among African communities themselves.

Since 1990, most African countries agree to liberalize their trading system through integration by removing barriers to trade (Jones, 1990). SADC, ECOWAS, and IGAD are some of the African trade unions. Another regional integration, in which Ethiopia became a member, called Common Market for Eastern and Southern Africa (COMESA) was established in 1994 after passing several processes and years. As noted in the Document of COMESA Treaty (1994), the integration constitutes 19 member states that agreed to co-operate in developing their natural and human resources focusing on the formation of large economic and trading units to overcome barriers to individual states and has a strategy to economic prosperity. The objective of regional agreement could range from economic to political, although it became a political economy initiative where commercial purposes are the means to achieve broader socio-political and security objectives. In either way, countries have benefited from regional integration, which reflected through economic growth, stable security, and rising standards of living for the peoples of the respective countries.

2.1.3.1 African Trading Blocs

There are a number of regional trading blocs in Africa whose goal is to realize better regional integration through customs and monetary unions, free trade areas, and common regulatory and legal frameworks. The main blocs are the Economic Organization of West African States (ECOWAS), Common Market for Eastern and Southern Africa (COMESA), Southern African Development Community (SADC), and Community of Sahel-Saharan States – CENSAD (Ntara, 2016).

ECOWAS is composed of western African nations while COMESA encompasses central and Eastern African states. SADC brings together southern African countries while CEN-SAD is composed of northern, central, and western African states. Memberships are not exclusive as some states are members of more than one regional trading bloc. For instance, eight nations are members of both COMESA and SADC, and all except one of ECOWAS partner states are members of CEN-SAD. Eight countries are members of both CEN-SAD and COMESA. Other regional trading blocs are the East African Community (EAC), comprising five eastern and central African states,

Economic Community of Central African States (ECCAS), with 10 western and central African states, Intergovernmental Authority on Development (IGAD) which has eight eastern African states, and Arab Maghreb Union which is composed of five northern African countries. Four African states are members of the Organization of Petroleum Exporting Countries (OPEC). They include Angola, Algeria, Libya, and Nigeria (The National Law Review 2014).

Some trading blocs have established free trade areas. EAC members (Kenya, Burundi, Rwanda, Uganda, and Tanzania) have a common market for labor, capital, and goods, but they lack a monetary union. Other free trade areas are contained within broad trading blocs. Some SADC partner states (Lesotho, Botswana, South Africa, Swaziland, and Namibia) have formed a customs union, the Southern African Customs Union (SACU), which allows them to trade freely among themselves. All SACU members except Botswana belong to a monetary union. In central and west Africa, some ECOWAS partner nations – Benin, Guinea-Bissau, Burkina Faso, Ivory Coast, Senegal, Mali, Togo, and Niger - have formed a customs union, the West African Economic and Monetary Union (WAEMU). The Central African Economic and Monetary Community (CEMAC) is a customs union formed by some ECCAS members – Chad, Gabon, the Republic of Congo, Equatorial Guinea, and Cameroon (The National Law Review 2014). In 2015 a Continental Free Trade Area (CFTA) which would unite three African trading blocs – SADC, COMESA, and the EAC was under discussion. The CFTA would strengthen the tariff liberalization efforts of Regional Economic Communities (RECs). According to Reuters, the CFTA is expected to enhance intra-African trade by establishing a 625-million market with a GDP of over \$1trillion and boost economies of scale and competition for African industries, resulting in poverty reduction, increased employment, economic growth, sustainable development, security, peace, self-reliance, and prosperity. The CFTA is poised to eliminate the continent's overlapping trade zone memberships and bolster intra-Africa trade which is critical to the region's economic prosperity. There are plans to expand the newly formed bloc further to encompass West Africa (Reuters, 2015).

2.1.3.2 COMESA

The history of COMESA began in December 1994 when it was formed to replace the former Preferential Trade Area (PTA) which had existed from the earlier days of 1981. COMESA, as defined by its Treaty, was established ‘as an organization of free independent sovereign states which have agreed to co-operate in developing their natural and human resources for the good of all their people’ and as such it has a wide-ranging series of objectives which necessarily include in its priorities the promotion of peace and security in the region (COMESA, 2019).

However, due to COMESA’s economic history and background its main focus is on the formation of a large economic and trading unit that is capable of overcoming some of the barriers that are faced by individual states.

COMESA’s current strategy can be described as an economic prosperity through regional integration. With its recently 21 member states, population of over 540 million and global trade in goods worth US\$ 235 billion COMESA forms a major market place for both internal and external trading. Its area is impressive on the map of the African Continent covering a geographical area of 12 million km². Its achievements to date have been significant.

A free trade area and customs union make the priority areas of COMESA. The FTA was achieved on 31st October, 2000 when nine of the member States namely Djibouti, Egypt, Kenya, Madagascar, Malawi, Mauritius, Sudan, Zambia and Zimbabwe eliminated their tariffs on COMESA originating products, in accordance with the tariff reduction schedule adopted in 1992. This followed a trade liberalization program that commenced in 1984 on reduction and eventual elimination of tariff and non-tariff barriers to intra- regional trade. Burundi and Rwanda joined the FTA on 1st January 2004. These eleven FTA members have not only eliminated customs tariffs but are working on the eventual elimination of quantitative restrictions and other non-tariff barriers.

COMESA offers its members and partners a wide range of benefits which include: a wider, harmonized and more competitive market, greater industrial productivity and competitiveness, increased agricultural production and food security, a more rational exploitation of natural resources, more harmonized monetary, banking and financial policies, and more reliable transport and communications infrastructure.

Trade and market integration has had a central role in the evolution of COMESA given its background as a Preferential Trade Area (PTA) for Eastern and Southern Africa. The previous foundation has therefore supported the establishment of institutions that foster trade liberalization and trade facilitation programs. In addition, article 4 of the Treaty Establishing COMESA reiterates the removal of obstacles to the free movement of persons, labor and services, along with the right of establishment and residence for investors in the COMESA region (UNECA, 2013).

At present, COMESA operates a free trade area (FTA) among fifteen of its member States, Burundi, the Comoros, Djibouti, Egypt, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, the Sudan, Uganda, Zambia and Zimbabwe. The Democratic Republic of Congo joined the COMESA FTA in December 2015 and is currently finalizing its tariff phase-down. A Customs Union was subsequently launched by COMESA in 2009. From the time of the launching, member States agreed on a three-year transitioning period to domesticate the customs management regulations, common external tariff and the common tariff nomenclature that would gradually form the Customs Union. The plan was to finalize the Customs Union by 2012, however, even after a second postponement of the transition period to 2014, the Custom Union is still not operational (UNECA, 2013).

In October 2008 COMESA, East African Community and Southern African Development Community agreed to negotiate a tripartite free trade agreement amongst the regional economic communities. After lengthy negotiations, the tripartite FTA was officially launched in June 2015. Although 17 out of the 26 Member States have signed the Tripartite FTA Agreement, it has not yet entered into force due to outstanding ratifications. Moreover, remaining technical work on tariff liberalization, rules of origin, and trade remedies are likewise delaying the process. However, interim arrangements were agreed to operationalize the Tripartite FTA, which would effectively make it the largest FTA in Africa. It has also been estimated that the Tripartite FTA could boost intra-regional trade by as much as one third. It is therefore important that remaining member States join the FTA avoid undermining the establishment of the Tripartite FTA (UNECA, 2013).

The Investment Agreement for the COMESA Common Investment Area (CCIA) was adopted in May 2007. It is an instrumental tool that the COMESA Secretariat anticipates will ensure a stable investment environment that promotes and protects cross-border investments. It aims at harmonizing investment policies, regulations and legislation, setting the standards for investor and

investment protection and encouragement along with creating an institution to facilitate intraregional economic community trade. For instance, expanding the number of bilateral Avoidance of Double Taxation Agreements, promoting arbitration mechanisms for investment disputes, harmonizing all company registration procedures, and developing capacity-building program on investors' services for the national investment promotion agencies. Moreover, COMESA's trade facilitation instruments, including the Regional Customs Transit Guarantee scheme and Yellow Card, are effective in the COMESA region and have been adopted by non-COMESA member States including Tanzania and South Sudan. Angola and Mozambique are soon expected to enlist even though they are not COMESA members (UNECA, 2013).

2.2 Theoretical Review

2.2.1 Free trade and economic integration

Free trade agreements are treaties that regulate the tariffs, taxes, and duties that countries impose on their imports and exports. The advantages and disadvantages of free trade agreements affect jobs, business growth, and living standards. Free-trade area is a form of economic integration in which free trade exists among member countries but members are free to levy tariffs on nonmember countries (Todaro and Smith, 2012). It is believed to remove trade barriers among members, but in which each country retains its own barriers against nonmembers (Nafziger, 2006). One form of such free-trade area is common market. Common market is a form of economic integration in which there is free internal trade, a common tariff, and the free movement of labor and capital among partner states according to Todaro and Smith (2012). For Nafziger (2006) it is a regional integration that removes trade barriers among members, retains common trade barriers against nonmembers, and, unlike a customs union, and allows free labor and capital movement among member states.

2.2.2 International Trade and Economic Growth

While a school of thought believes that it is the trade restrictions that hindered Africa's exports to developed countries and some developing countries, thereby reducing the income level and employment rate, another argued that even if Africa's exports are allowed free access to the developed countries' markets, the continent lacks the ability to produce to meet the demand due to Africa's supply constraints (Kareem, 2009).

Several studies addressed the impact of international trade on economic growth of a country. The findings of these studies indicate that international trade i.e. exports and imports has a statistically significant positive impact on economic growth (GDP) of a country. A study that examined the impact of export composition on economic growth, indicated that not all exports contribute equally to economic growth. Many developing countries depend on exports of primary products, which are subject to excessive price fluctuations and this category of exports had negligible impact on economic growth, while manufactured exports had a positive and significant effect on economic growth (Kim & Lin, 2009).

Earlier development theories of Adam Smith, as reviewed by Dang and Pheng (2015), free trade, private property and competition are seen as the foundations that would spur economic development, reduce poverty and bring on social and moral improvements of humankind. Modern theories of trade show that economic growth is a pre-condition for growth in international trade. Increase in output leads to rise in exports if such increase is coupled with rise in productivity and decline in unit costs. It becomes easier to sell domestic goods abroad. Hence, the connection between economic growth and international trade may be closer and more than one way effect. According to the Ouma *et al* (2016), Safdari and Mahmoodi (2011) highlighted four different kinds of relationships possible between economic growth and international trade as follows: export-led growth, growth driven export, case of feedback relationship between export and economic growth (bi-directional), and case of no relationship at all.

International agricultural trade has the potential of transforming livelihoods in agricultural dependent economies since it presents opportunity for farmers to export their produce, thereby providing incomes and boosting agricultural production. It also affects households' access to adequate food through its impact on commodity prices, access to markets for producers and labour entitlements (Ouma *et al*, 2016). It is, therefore, clear that the dynamics and linkages between agricultural trade and rural livelihoods can occur in various phases. Firstly, rural households earn higher incomes from production and sale of agricultural goods to non-local markets, and thereby increasing their demand for consumer goods. Secondly, the higher aggregate demand leads to creation of non-farm jobs and employment diversification, especially in small towns close to agricultural production areas, which in turn (thirdly) absorbs the surplus rural labour, raises demand for agricultural produce, and boosts agricultural productivity and rural incomes.

2.3 Empirical Review

2.3.1 Importance of Livestock in East Africa

East Africans depend largely on agricultural activities to boost their economic growth and create employment with record up to 80 per cent of the population depending on agriculture directly and indirectly for food, employment and income (Ouma *et al*, 2016). FAO (1994) defines livestock in a wide sense to include all grown animals regardless of age, location or purpose of breeding excluding non-domesticated animals. Livestock, under FAO's definition include large and small quadrupeds, poultry, insects (bees) and larvae of insects (silkworms). The Encyclopedia Britannica, however, defines livestock narrowly as farm animals, with the exception of poultry, noting the difference in species inclusion among different economies. In Western countries the category encompasses primarily cattle, sheep, pigs, goats, horses, donkeys, and mules; other animals, such as buffalo, oxen, or camels, may predominate in the agriculture of other areas (Garrigus and Holden, 2016). Livestock farming is raising of animals for use or for pleasure. This study takes the FAO definition of livestock as listed in Annex 2, which is the primary commodity trade data source used in the analysis.

The fact that the major proportion of the land area in the region is classified as arid, with highly variable rainfall making it unsuitable for crop production. This leaves livestock production as the only viable form of land use. Pasture-based livestock production is the dominant land use in the arid zone and in the lower rainfall areas of the semi-arid zone, involving seasonal or annual mobility of livestock in search of pasture over a large area of rangeland. However, it is worth noting that it is not only the arid and the semi-arid zone that is engaged in the raising of livestock. A favorable climate, relatively moderate disease and pest problems, and high production potential make the highland zone a favorable environment for livestock keeping (IGAD, 2014).

The contribution of live animals and their products to the agricultural economy accounts between 18 and 88 percent % of the net value of agricultural production in East Africa (Noula *et al*, 2013). Livestock and products trade within and outside of the COMESA region has significant contribution to economic growth in the region. Sub-Saharan Africa exports to EU is decreasing; bovine meat at 22.5% and raw hides and skins at 3.3% between 2016 and 2017 (EU, 2018).

Market share of live animals and their products from agricultural import trade from EU to SSA is at 20.4% while export to EU accounts less than 1% of agricultural products (EU, 2018). Better exports to the EU from SSA was observed on meat and raw hide and skin exports.

Table 2.1 Trends in EU Animal products exports to and imports from Sub-Saharan Africa, 2013 – 2017

Exported item	Export values in Million Euros					Share in all Agricultural products in 2017	Change 2016-2017
	2013	2014	2015	2016	2017		
Live animals	43	43	48	57	58	0.6	1.8
- -Bovine meat, fresh, chilled and frozen	22	31	41	43	46	0.5	7.0
- - Pork meat, fresh, chilled and frozen	120	150	160	129	150	1.6	16.3
- - Poultry meat, fresh, chilled and frozen	566	620	637	510	549	5.9	7.6
- - Sheep and goat meat, fresh, chilled and frozen	8	9	9	8	10	0.1	25.0
- - Offal, animal fats and other meats, fresh, chilled and frozen	106	114	143	111	149	1.6	34.2
- - Meat preparations	192	193	159	137	134	1.4	-2.2
- - Fresh milk and cream, buttermilk and yoghurt	128	154	152	128	152	1.6	18.8
- - Eggs and honey	46	49	47	47	42	0.5	-10.6
- - Raw hides, skins and fur-skins	7	8	10	9	12	0.1	33.3
	Imports values in Million Euros						
Live animals	10	11	12	12	14	0.1	16.7
- - Bovine meat, fresh, chilled and frozen	66	67	93	80	62	0.5	-22.5
- - Pork meat, fresh, chilled and frozen	0	0	0	0	0	0	0
- - Poultry meat, fresh, chilled and frozen	0	0	1	0	2	0	
- - Sheep and goat meat, fresh, chilled and frozen	0	0	0	0	0	0	0
- - Offal, animal fats and other meats, fresh, chilled and frozen	4	2	9	17	9	0.1	-47.1
- - Meat preparations	5	5	10	6	7	0.1	16.7
- - Fresh milk and cream, buttermilk and yoghurt	0	0	0	0	0	0	0
- - Eggs and honey	1	1	2	2	2	0.0	0.0
- - Raw hides, skins and fur-skins	67	64	84	61	59	0.4	-3.3

Source: EU. 2018.

2.3.3 Trade and Economic Growth in COMESA Member Countries

The relationship between trade openness and economic growth has been theoretically controversial. While conventional wisdom predicts a growth-enhancing effect of trade, recent developments suggest that trade openness is not always beneficial to economic growth. Increased international trade can generate economic growth by facilitating the diffusion of knowledge and technology from the direct import of high-tech goods.

The report by Kehinde, Jubril, and Felix (2012) that highlighted the impact of international trade on economic growth using a rank correlation analysis among developed countries showed a positive relationship between international trade and economic growth. A study from Ghana showed a negative relationship between international trade and economic growth in the long run (Frimpong and Obeng, 2006). Arega (2014) reported significant relationship between agricultural trade openness and economic growth of SSA countries where trade openness explained 22.5% of economic growth. The top five agricultural export commodities from COMESA are coffee, tobacco, tea, cane sugar and flower, the former two making the fourth and fifth among all export commodities, next to petroleum, copper and gold (Badiane *et al.*, 2018).

Abdulai and Jaquet (2002) tested the export led growth hypothesis in Cote d'Ivoire using time series data for the period 1961-1997. They examined both the short-run and long-run relationship between economic growth, exports, real investments, and labor force. Testing for co-integration and using the ECM, the authors found that there was evidence of one long-run equilibrium relationship among all the four variables. Exports were also found to cause economic growth both in the short-run and in the long-run. Furthermore, bidirectional causality between economic growth and exports was also found to be statistically significant.

2.3.3 Trends in Economic Integration.

The majority of preferential trade agreements are between emerging economies, the so called South-South integration. The last few decades have not only seen an increase in the volume of international trade, but also an increase in the number of preferential trade agreements through which exchanges take place. A preferential trade agreement is a trade pact that reduces tariffs between the participating countries for certain products. Results show the increasingly important role of trade between developing countries (South-South trade), vis-a-vis trade between developed and developing countries (North-South trade). In the late 1970s, North-South agreements accounted for more than half of all agreements in 2010, they accounted for about one quarter. Today, the majority of preferential trade agreements are between developing economies (Ortiz-Ospina, *et al.*, 2018).

2.4 Conceptual Framework

As reports indicate, East Africans depend largely on agricultural activities to boost their economic growth and create employment with record up to 80 per cent of the population depending on agriculture directly and indirectly for food, employment and income (Ouma *et al*, 2016). For those countries, the dominance of agriculture is one of the major distinguishing features. In their trade, export tends to be dominated by the primary products. The balance of payment position is against the developing countries as their export performance is low.

The empirical findings has shown above that economic growth and agricultural trade openness are positively associated (Kehinde, Jubril, and Felix, 2012; Arega, 2014). It has also been shown that free trade enables member countries trade freely without tariff and non-tariff barriers (Todaro and Smith, 2012). It is, thus, conceptualized in this study that free trade membership promotes economic growth. Regional integration is believed to be an important catalyst to reduce trade barriers and increase developing country participation in regional and global value chains. COMESA offers a significant opportunity to agrarian economies in the member countries to trade with each other without tariff and non-tariff barriers.

Based on the report by Abdulai and Jaquet (2002) that highlighted a bidirectional causality between economic growth and exports, it is conceptualized in this report that agricultural export and economic progress has forward and backward relationship. As the economy grows, it can supply improved agricultural inputs of production and infrastructure (institutional and physical), which incentivize agricultural productivity and marketing and in turn increase volume and contribution of agricultural product export to national as well as regional earning. The conceptual framework is stated in short in Figure 2.1 below.

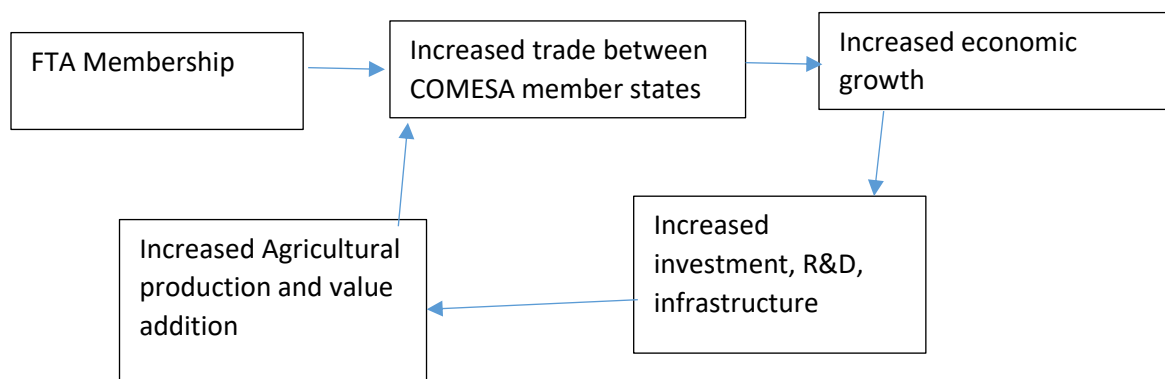


Figure 2.1 Conceptual Framework of the Study

CHAPTER 3.

3. RESEARCH METHODOLOGY

3.1 Research Approach and Design

The research approach of this study is quantitative as it uses econometric data, such as GDP and export values, to identify association between economic growth measured in GDP and agricultural commodity production and commodity trade (live animal and products) in COMESA preferential trade area. The research is designed following descriptive and causal relationship between economic growth and livestock commodities export while quantifying the share of these commodities from the total exported commodities in the economy of the selected COMESA member countries. A quantitative approach whereby descriptive and inferential statistics design was followed in this study to assess the theoretical relationship with empirical evidences particularly in the context of agricultural commodity international trade and economic growth in preferential trade bloc in Africa.

3.2. Variables, Data Sources and Data Collection Methods

3.2.1 Data Sources and Collection Methods

This study used the secondary balanced panel data from year 1991 to 2018. Total observations of 308 were targeted for each variable from 11 panel and 28 time variables. Data were gathered from official online secondary sources such as FAOSTAT DATA for agricultural export commodity data, the World Bank for National Accounts data. All data used in study were quantitative.

3.2.2 Variables Description

This study attempted to identify the association that live animal and animal products trade (export and import) have with economic growth in COMESA member countries. The following variables were used to describe and analyze the impact of livestock sector contribution to economic growth in the COMESA region;

Table 3.1 Variables description, data source and expected association

Variable and code	Data Source	Data Description	Expected association
Gross domestic product (GDP)	World Bank Data	Gross domestic product in USD as current value to each year and each country	Dependent variable
Livestock Production (LSProd)	FAOSTAT Data	Value of livestock production in USD	Independent variable with positive association with GDP
Live animal import (IMPLA)	FAOSTAT Data	Value of live animal imports in USD	Independent variable with negative association with GDP
Live animal export (EXPLA)	FAOSTAT Data	Value of live animal exports in USD	Independent variable with positive association with GDP
Livestock products export (PEXP)	FAOSTAT Data	Sum of value of dairy products, meat, hides, skins and eggs exported, in USD	Independent variable with positive association with GDP
Livestock products Import (PIMP)	FAOSTAT Data	Sum of value of dairy products, meat, hides, skins and eggs imported, in USD	Independent variable with negative association with GDP

3.3. Population and Sampling

3.3.1 Description of the Study area

COMESA region is the largest regional bloc in Africa. It stretches between Tunisia in the northern Africa and Zimbabwe in the south covering area of 11.8 million square kilometers. The area is home to more than 555 million people that generated 2.2 trillion USD income in 2018. A vast population of livestock are found in this region with the leading cattle population records of 95 million heads in total from Ethiopia and Sudan (CIA, 2018). Table 3.2 presents details of geographic, economic, demographic and livestock resource base of the COMESA region.

Table 3.2 Geographic, economic, demographic and livestock resource base of COMESA member countries

Countries	Human population /in million/	Area /km ² /	GDP/PPP/ /In billion USD/	% OF GDP			Animal population /in million /		
				Agriculture	Industry	Service	Cattle	Camel	Sheep and goat
Burundi	11.80	27,830	8.00	40	16	44	0.33	na	0.26
Comoros	0.80	2,235	1.32	48	12	41		na	na
Congo, D.R.	85.20	2,344,858	68.60	20	44	37	0.90	5.30	0.85
Djibouti	0.88	23,200	3.64	2	17	80	0.27	na	0.97
Egypt	99,4	1,001,450	1200.00	26	25	49	4.80	0.15	9.40
Eritrea	5.97	117,600	9.40	12	30	59	1.55	0.37	3.27
Ethiopia	108.00	1,100,000	200.60	35	20	45	60.00	4.80	82.00
Kenya	48.50	580,367	163.70	6	7	87	13.30	3.10	13.40
Libya	6.30	1,759,540	61.97	1	52	46	1.70		3.32
Madagascar	25.60	587,041	39.80	24	20	57		na	na
Malawi	19.80	118,484	39.80	22	77	4	0.75	na	1.37
Mauritius	1.30	2,040	28.20	4	22	74	1.40	na	10.30
Rwanda	12.10	26,338	24.60	31	18	52	0.73	na	0.92
Seychelles	94.60	455	2.75	3	23	74		na	
Sudan	43.10	1,861,484	45.80	40	3	58	35.00	3.00	79.50
Swaziland	1.08	17,364	4.47	7	45	49	0.66	na	0.46
Somalia	11.25	637,657	20.44	60	7	33	0.34	0.08	4.60
Tunisia	11.50	163,610	137.70	10	26	64	1.50	0.24	7.90
Uganda	40.85	241,038	89.19	28	21	51	5.70	na	5.55
Zambia	16.40	752,618	68.93	8	35	57	2.20	na	1.19
Zimbabwe	10.03	390,757	34.27	12	22	66	5.50	na	3.30
TOTAL	555.06	11,755,966	2253.18	21	26	53	136.62	17.03	228.56

Source: World Factbook, CIA (2019)

3.3.2 Population of the Study

Neuman (2003) stated that target population is said to be a specified group of people or object for which questions can be asked or observed made to develop required data structures and information. Therefore, for this study, the target population is a finite population of COMESA member countries, namely Burundi, Comoros, D. R. Congo, Djibouti, Egypt, Eritrea, Eswatini, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Somalia, Uganda, Zambia and Zimbabwe. Descriptive analysis part has based on these population data.

3.3.3 Sampling

According to Alreck & Settle (2005) the choice of sample size is normally made after considering statistical precision, practical issues and availability of resources. Malhotra & Peterson (2006) stated that, the larger the sampling size of a research, the more accurate the data generated. This study included all the member countries with adequate data set to make inferences about their livestock sector international trade. Of the 21 countries listed in the population above, only Burundi, Egypt, Eritrea, Ethiopia Kenya, Madagascar, Mauritius, Malawi, Rwanda, Sudan and Tunisia were selected for having adequate data for years 1991 – 2018 to run balanced panel data regression analysis with post-estimation tests. Therefore, the econometric analysis was made based on data from these sample countries.

3.4 Method of Data Analysis

3.4.1. Analysis Tools

After the data were collected both descriptive and inferential econometric analyses were employed to analyze the panel data. The descriptive analysis includes mean, minimum, maximum and standard deviation. The regression analysis was used to identify effect of livestock production and trade (import and export) on economic growth of the sampled countries in COMESA. Thus, both the strength of the relationship between variables and the influence of independent on dependent variable and statistical significance were assessed. STATA 14 software was used for the inferential analysis and SPSS 16.0 was used for the descriptive and Pearson's correlation analysis.

3.4.2 Model Specification and Hypotheses

The objective of this study is to analysis the relationship between livestock product and trade on economic growth of COMESA member countries. To achieve the entire objective the model has the following macro-economic variables. The variable includes GDP, Livestock Production (LSProd), live animal import (IMPLA), live animal export (EXPLA), livestock product import (PIMP), livestock product export (PEXP) which were collected from FAOSTAT and the World Bank databases. Livestock products

included dairy products, meat, eggs, and hide and skins. And live animals included cattle, camel, sheep, goats, pigs and poultry. All variables' data were in values of USD.

3.4.2.1 Model Specification

The standard panel data model according to Wooldridge, (2002) which satisfies the classical model assumptions was developed as

$$Y_{it} = \beta_0 + \beta X_{it} + v_{it}, \text{ where } i = 1 \dots N \text{ and } t = 1 \dots T \dots \dots \dots (1)$$

Where, X_{it} is K-dimensional vector of explanatory variable without a constant term,

β_0 is the intercept and independent of i and t ,

β_a (K+1) vector, the slopes independent of i and t ,

v_{it} the error term which varies over i and t .

The panel data model also classified as a fixed effect model and random effect model. The fixed effects model is specified as follows:

$$Y_{it} = \beta_0 + \beta X_{it} + v_{it}, \text{ where } i = 1 \dots N \text{ and } t = 1 \dots T \dots \dots \dots (2)$$

$$\varepsilon_{it} = \alpha_i + v_{it} \dots \dots \dots (3)$$

$v_{it} \sim \text{NIID}(0, \delta_v^2)$;

α_i denotes a cross-section-specific effect, and

v_{it} is the idiosyncratic error term (Hsiao, 2002).

In the fixed effects analysis, α_i is arbitrarily correlated with X_{it} , $E(X_{it}'\alpha_i) \neq 0$ (Wooldridge, 2002).

Accordingly the random effect model which implies that both the intercept and the slope varies and the intercept is included in the error term. According to Wooldridge, (2002) the model specifies as follows.

$$Y_{it} = \beta X_{it} + u_{it}, \text{ where } i = 1 \dots N \text{ and } t = 1 \dots T \dots \dots \dots (4)$$

$$u_{it} = \alpha_i + v_{it} \dots \dots \dots (5)$$

where $\alpha_i \sim \text{NIID}(0, \delta_{\alpha}^2)$; $v_{it} \sim \text{NIID}(0, \delta_v^2)$.

In the random effects approach, α_i is in the composite error term that is orthogonal to the explanatory variables, (X_{it}) , $E(X_{it}'\alpha_i) = 0$. Furthermore, the method accounts for the implied serial correlation in the composite error, $u_{it} = \alpha_i + v_{it}$, the same way as the generalized least squares (GLS) estimation technique (Wooldridge, 2002).

Based on the above macroeconomic variable to capture the stated objectives the study has one dependent variable, the GDP, and three independent variable, livestock production, live animal import, live animal export, animal product import and animal products export. Mathematically, the model is described as follows;

$$\ln \text{GDP}_{it} = \beta_0 + \beta_1 \ln \text{LSProd}_{it} + \beta_2 \ln \text{IMPLA}_{it} + \beta_3 \ln \text{EXPLA}_{it} + \beta_4 \ln \text{PIMP}_{it} + \beta_5 \ln \text{PEXP}_{it} + u_{it} \dots \dots \dots \text{eq}(6)$$

$$u_{it} = \alpha_i + v_{it}$$

Where, GDP is GDP at current value,

LSProd is Livestock production value,

IMPLA is Import value of live animals,

EXPLA is Export value of live animals,

PIMP is Import value of animal products,

PEXP is Export value of animal products,

''U'' is the Error term and the subscript ''it'' indicates the country and the time period respectively and

''ln'' is the natural logarithm form of each variable described above.

3.4.3. Post Estimation Tests

3.4.3.1 Test for unit roots

The unit root tests of the variable was checked using Harris-Tzavalis unit-root test, Levin- Lin- Chu & Hadri Lm stationarity tests with the following hypotheses;

H0: Panels contain unit roots and

H1: Panels are stationary

If the variable is stationary or not is based on the P-value if the p value is greater than 0.05(5%) reject the null hypothesis implies that there is stationeries otherwise the variable have stationary problem. Annex 1.1 shows the results of the unit root test.

3.4.3.2 Normal distribution

Normal distribution test: Skewness test was made and results showed that data did not have normal distribution ($P > \text{Chi}^2$). As a remedy data was transformed to natural logarithmic value of all dependent and independent variables (Annex 1.2).

3.4.3.3 Test for multicollinearity

Multi-collinearity is phenomenon that, when occurred in the multiple regressions, results in greater confidence interval and high estimation of standard errors (small t- value) and high R^2 . It may occur as a result of little variation in the explanatory variable or high correlation between one or more explanatory variables (Gujarati, 2004). In this study the problem was checked by the variance inflation factor (VIF). As a rule of thumb if the VIF is greater than 10 there is a multicollinearity problem. It was found that the

explanatory variables, i.e. livestock production, export and import, showed no multicollinearity as all VIF values were less than 10 as shown in Annex 1.3.

3.4.3.4 Hausman specification test

Under this section we carry out some diagnostic tests to examine which estimation technique fits the model and the data well. Panel data models examine fixed and/or random effects of group of time. Hence, our data should have individual effects or time effects. In order to examine the presence of individual effects and/or time effects, it is required to perform either fixed effects or random effects test.

For choosing whether fixed effect or random effect used in the mode Hausman specification testes is used. Therefore the study test the specified models under which model they fail whether fixed effect or random effect is appropriate. The null and alternative hypothesis for this test are:

H₀: difference in coefficients not systematic (Random effect is appropriate) and

H₁: H₀ is not true.

If we fail to reject the null hypothesis, the random effect regression model is favored and vice versa. The result of this test are presented in Annex 1.4. A fixed effect was, thus, followed to run the regression as $P > \text{Chi}^2$ was significant enough to reject the null hypothesis.

3.4.3.5 Test for Heteroskedasticity

The homoskedasticity assumption states that the variance of the unobservable error, u , conditional on the explanatory variables, is constant. Homoskedasticity fails whenever the variance of the unobservable changes across different segments of the population, which are determined by the different values of the explanatory variables (Wooldridge, 2004). In short, if we persist in using the usual estimation procedures despite heteroskedasticity, whatever conclusions we draw or inferences we make may be very misleading according to Gujarati (2004). In this study, thus, the Breusch – Pagan test was applied for detecting heteroskedasticity as discussed in Verbeek (2000). This study estimates the square of residual of the random effects model. The test statistics multiplies the R^2 of auxiliary regression of this residual with explanatory variables used in the model by $N(T-1)$. The test statistics has a Chi-square distribution with J degrees of freedom, where J is the number of explanatory variables used in the auxiliary regression. Variables were showing heteroscedasticity and as a result a generalized transformation was used and the feasible generalized least squares (FGLS) estimators were used to correct heteroscedasticity as well as serial correlation problems (Gujirati, 2011).

CHAPTER 4

4. RESULT AND DISCUSSION

4.1 Descriptive Analysis of Livestock and Products Trade in COMESA

4.1.1 Socio-economic description of the study area

As shown in the Table 3.2, the COMESA member countries have a total of 2.2 Trillion USD economy which is much less than world's top 5 countries economy. On the average share of service sector is 54.12% of GDP which makes the sector the main actor in majority of member countries. The agricultural sector is at 21% of the GDP contribution which is still within range of the report from the end of the previous millennia (Cleaver, 1985).

On average, livestock production accounts to 28% of the agricultural production in the sampled countries as shown in Table 4. According to IGAD (2013) national accounts neglect the contribution of livestock to crop production in the form of manure as fertilizer, drought power as means of cultivating land and transporting agricultural produce to the market and farm in countries such as Ethiopia where 80% of the crop production utilizes oxen power. Therefore, it can be argued that this result represents the minimum contribution of livestock sub-sector to the economy of nations in COMESA region. Taking Ethiopia, Sudan and Kenya has respectively cattle population of 60, 35 and 13.3 Million and share of service is 87.2%, 45% and 43.1%, respectively, which can show that livestock sector is not contributing much to the economy. The same is presumed on other livestock sources, such as sheep and goats, which these member countries are not doing well in the sector under consideration. However, it should be noted that the contribution of the cattle is underestimated by national accounts as reported by IGAD (2013).

Table 4.1 Mean values of production and trade of agriculture and live animal (1991 – 2018)

Variables	Mean	Minimum	Maximum	Std. Deviation
Agricultural Production (in Million USD)	6082.80	136.04	38028.93	7405.32509
Livestock Production (in Million USD)	2056.70	37.74	15775.21	2978.89507
Livestock to total Agriculture Ratio (%)	28.55	4	81	16.738
Total Agricultural Imports (in Million USD)	1160.10	12.28	15252.57	2428.03176
Total Agricultural Exports (in Million USD)	730.07	.16	5093.66	969.94918
GDP, Current (million USD)	27877.00	422.03	3.33E5	53321.92228
Live animal import (million USD)	12.1486	.00	240.61	33.66127
Live animal export (million USD)	21.1613	.00	544.76	69.88111

Source: own calculations from FAOSTAT data (2019).

4.1.2 Livestock and Products Balance of trade in COMESA Member Countries

Fifty-five percent of the sampled countries are in negative balance of trade in terms of live animal commodity with Egypt scoring the highest (-85.7 million USD) between 1991 and 2017. Sudan has the highest positive balance of trade in live animals, with record of 144 million USD, followed by Ethiopia. Placed at the top in cattle population from Africa, Ethiopia seems losing benefits of its immense livestock resources (4.1.)

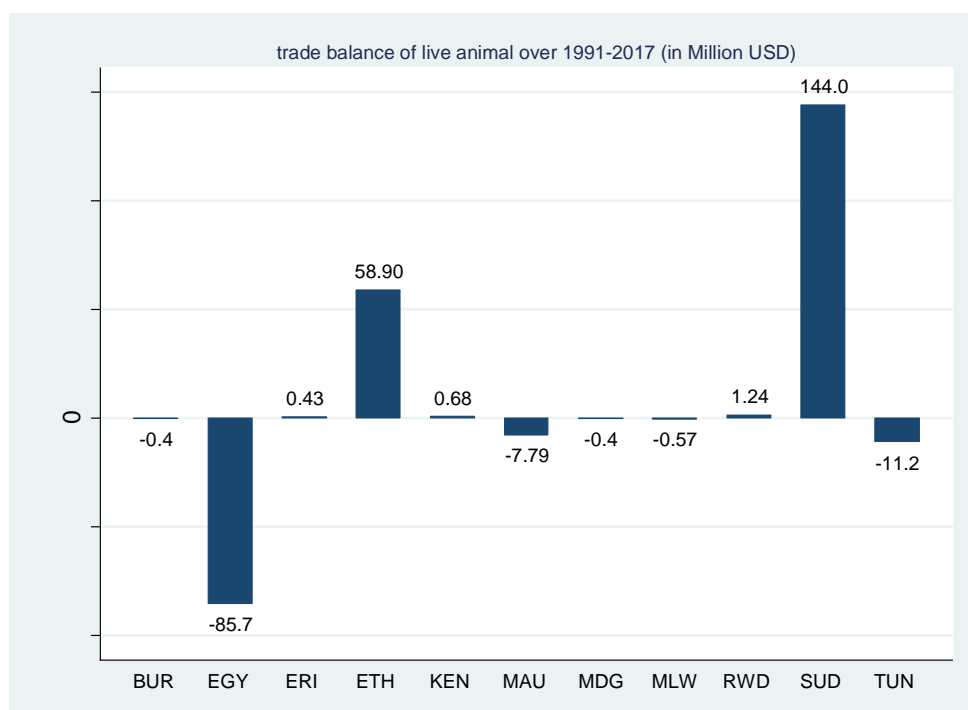


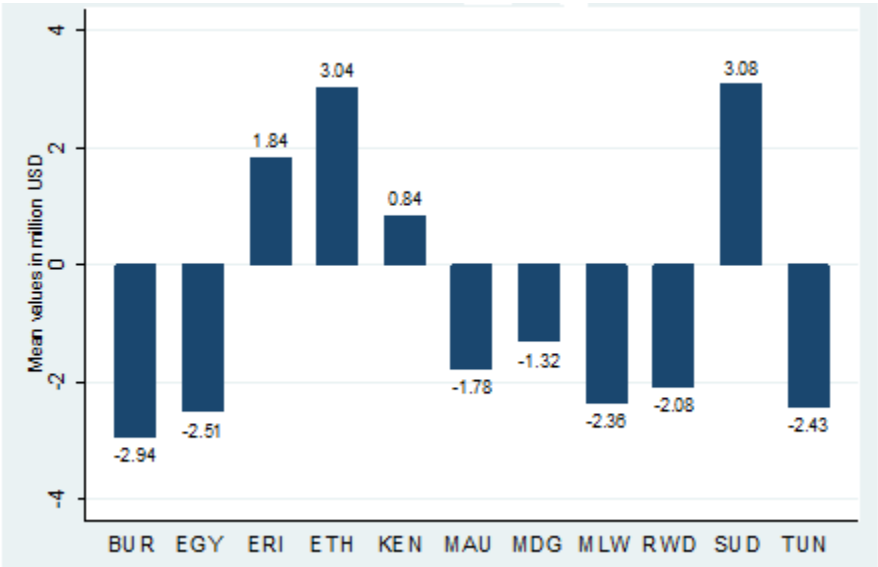
Figure 4.1 Trade Balance of live animal over 1991 -2017 in million USD

Source: own computation from analysis of FAOSTAT data.

As Figure 4.2 below illustrates the balance of trade of COMESA member countries in animal products commodity. The countries with the higher positive balance of trade are Sudan and Ethiopia which is expected considering their livestock resource endowments and similar magnitude of trade balance in live animal commodity. However, since this study did not analyze data about the destination of exports and source of imports it is less confident to address the share of COMESA region from this expanded market.

Animal products trade is subject to a number of regulatory standards and requires higher level of technology such as processing and cold chain facilities as compared to live animal trade (Geboye, Melaku. 2007). The negative balance of trade observed in majority of the COMESA member countries in the current study

signals COMESA member nations trade mostly with the rest of the world. This in turn indicates a potential to develop the intra-regional trade for live animal and products.



Source: own computation from analysis of FAOSTAT data.

Figure 4.2 Animal products balance of trade in COMESA member countries (in million USD, 1991-2017)

4.1.3 Trends in livestock and products international trade in COMESA

Figure 4.3 below shows the trend in live animal international trade in COMESA member countries. Apparently, there is an increasing trend in live animal exports in COMESA member countries especially since 2008. Following this time overlap between the accelerated growth in live animal export trend and COMESA establishment, it is argued here that COMESA has an effective trade facilitation role through its FTA.

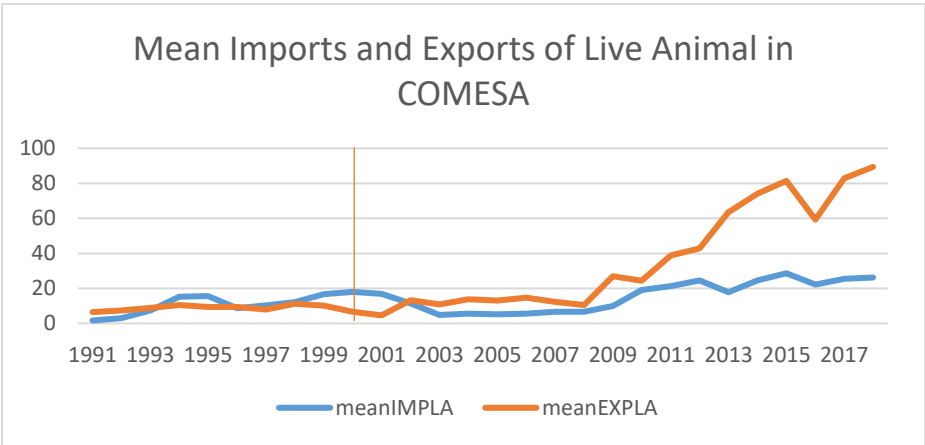


Figure 4.3 Mean imports and export values of live animal in COMESA member countries

Figure 4.4 below illustrates the trend in the import and export of animal products in COMESA region. The year 2000 was a benchmark for the establishment of COMESA. Figure 4.FTA and the increase in trade values trends is observed to accelerate afterwards, especially since 2005. This indicates that free trade areas promote the exchange of livestock products

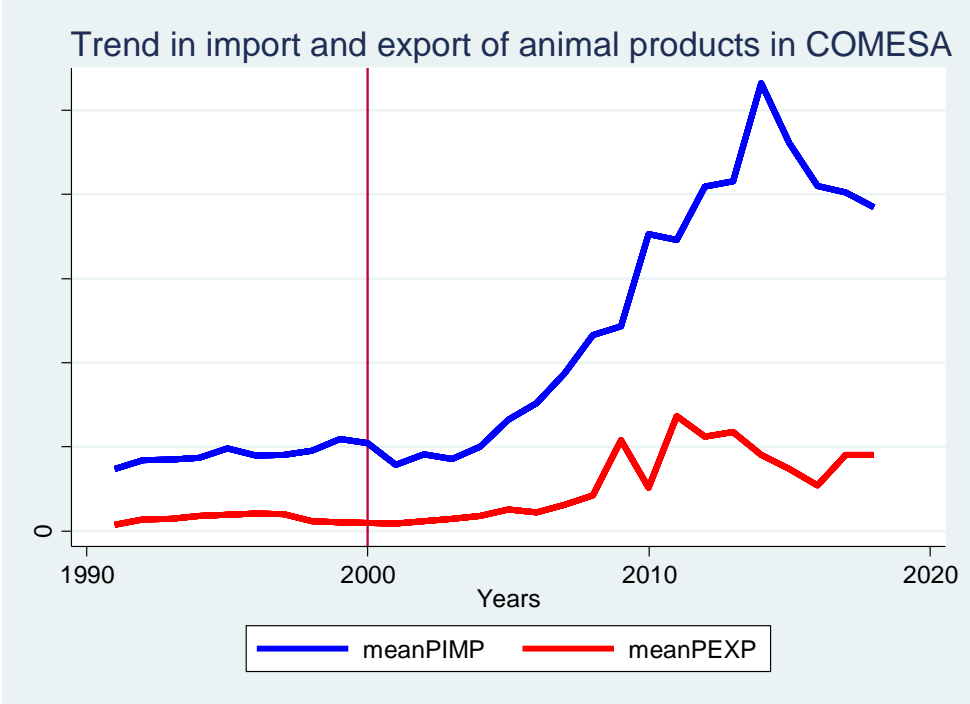


Figure 4.4 Trend in animal products import and export in COMESA member countries

4.2. Relationship between COMESA FTA membership and live animal and products trade

4.2 shows the correlation between membership to the FTA of COMESA and livestock commodities trade. GDP and imports of animal products have highly significant correlation with FTA membership addressing free trade area’s importance to develop economic growth and promote importation of welfare improving goods such as high quality animal proteins. This is in line with the above results where growth trends in live animal and animal products accelerated after the establishment of COMESA FTA in year 2000. Live animal import has shown significant correlation with COMESA FTA membership.

As COMESA FTA facilitates international trade in the region through lifting tariff and non-tariff barriers such as high standards for primary products, the livestock sector of member states can improve efficiency as one of the key impacts of free trade is efficiency improving and welfare improving (Bjornskov, 2005).

Table 4.2 Pearson's Correlation between trade, economic growth and FTA membership to COMESA

Pearson correlation	GDP	FTA-membership	IMPLA	EXPLA	PIMP	PEXP
GDP	1	0.252**	0.696**	0.162**	0.925**	0.777**
FTA-membership		1	0.120*	0.077	0.230**	0.137*
IMPLA			1	0.040	0.709**	0.420**
EXPLA				1	-0.019	0.087
PIMP					1	.761**
PEXP						1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Source: own analysis from FAOSTAT (2019) and World Bank (2019) data

4.3 Estimation Results for Economic Growth and Livestock Commodity Trade variables

The main objective of this study was to detect and measure the impact of live animal and products international trade on economic growth of nations that are member of the COMESA regional integration. Since the data for this study cover a time period of 28 years across 11 COMESA member countries the estimation and interpretation of the inferences is based on panel data analysis. After checking the normality and stationarity tests of the variable the study used the Hausman specification tests to choose whether the fixed effect model or random effect is appropriate to interpret the regression results. Finally the multicollinearity and heteroskedasticity problems were also checked and the existing problems solved using logarithmic transformation and using the feasible generalized least square (FGLS) methods to rectify heteroscedastic and serially correlated nature of the variables.

The FGLS model estimation result is displayed in detail in Annex 1.6. The growth model equation tested was as follows;

$$\ln\text{GDP}_{it} = \beta_0 + \beta_1 \ln\text{LSProd}_{it} + \beta_2 \ln\text{IMPLA}_{it} + \beta_3 \ln\text{EXPLA}_{it} + \beta_4 \ln\text{PIMP}_{it} + \beta_5 \ln\text{PEXP}_{it} + u_{it}$$

4.3.1 Post-estimation test results

Unit root tests

The unit root tests of the variable is checked from methods of panel data unit root testing methods by Harris-Tzavalis unit-root test , Levin- Lin- Chu & Hadri Lm stationary tests such that the null and alternative hypothesis for the variable states that

Ho: Panels contain unit roots and

H1: Panels are stationary

The method to know whether the variable is stationary or not is based on the p value if the p value is greater than 0.05(5%) reject the null hypothesis implies that there is stationeries otherwise the variable have stationary problem. After the transformation of variables in to the logarithm form all the variables are stationary. The results of unit root tests are attached on the Annex 1.1.

Normality Tests

As shown on the skewness and kurtosis all variables were not normally distributed from the population. To overcome a skewed distribution in data, the study transformed all variables into logarithm form. Transformation of variables is among the solutions to normalize the variable. After making the logarithm form the normality of the variable on the box plot then the variable is normal (see Annex 1.2).

Hausman specification test

The specification test hypothesis H0: random effect is appropriate and

Ha: fixed effect is appropriate

The decision to choose weather fixed effect or random effect is based on the Prob>chi2. If the pro>chi2 is greater than 5% the null Hypothesis is accepted which means random effect is appropriate model and if the Prob>chi2 is less than 5% fixed effect model is appropriate.

Based on the Hausman specification results for the growth equation the random effect model was appropriate. The results of Hausman specification tests are attached in the appendix 4 in the back mater of the study.

Multicollinearity test

In the presence of a problem of multi co linearity the regression results may lead to high R² and large confidence interval which means the coefficient cannot be estimated with greater precision and accuracy.

The study checked the presence of multicollinearity problem by variance inflation factor (VIF) attached in the Annex 1.3. That means there is no a problem of multicollinearity problem in the all models.

Heteroscedasticity tests

One of the assumptions of OLS estimators is homoscedastic assumption or constant variance in the panel data the presence of heteroscedasticity is due to large population and small sample size as a result in most case it is not the problem of a panel data analyses. But the study tests by Breusch-pagen /cook-Weisberg tests &a white test of heteroscedasticity the result suggests that there is no a problem of heteroscedasticity. The results are attached in the Annex 1.5 of the back matter of the study.

4.3.2. Estimation Results

Table 4.3 presents model estimation results after the post-estimate tests listed in Chapter 3 –Section 3.4.3 were made and remedial measures were taken. The Prob > chi² = 0.000 result show that the model is fit enough to explain the association between GDP and the livestock commodities trade variables considered.

Overall R² of 0.8377 indicates that for the variation observed in the dependent variable lnGDP in the above model, 83.77% is explained by variation in the independent variables. This means local livestock production, live animal import, animal product export as well as import have shown significance in explaining the variation in GDP.

Among the explanatory variables only lnEXPLA was insignificant in explaining the observed variation in GDP. Hence, export of live animal does not contribute to economic growth. Export of goods and services are expected to contribute to economic growth. However, live animal export in COMESA region was found to be insignificant to economic growth of the member countries.

Table 4.3 Growth model estimation results

Dependent variable log of GDP (lnGDP)			
Independent variable	Coefficient	Sd. Error	P>z
lnLSProd	0.49	0.023	0.000***
lnIMPLA	0.02	0.011	0.091*
lnEXPLA	-0.01	0.009	0.399
lnPIMP	0.29	0.017	0.000***
lnPEXP	0.12	0.017	0.000***

*Significant at 10%, ** significant at 5% & *** is significant at 1%

Number of observation=308

Time periods = 28

Number of groups =11

Overall R² = 0.8377

Waldchi² =3656.57

Prob > chi²=0.000

Source: model result of growth equation (Annex 1.6)

All the expected signs were observed to hold in the model except for lnEXPLA. Even though this variable is not significant, the negative association between export and economic growth was unexpected. This could arise from either quality of data as secondary data are subject to modifications such as projecting missing data and reliability of local reports.

The current study results indicate that livestock production significantly contributes to economic growth of COMESA member countries and explains the variation in GDP by 49% ($P < 0.000$). The contribution of livestock as food and non-food products and services to households has been reported by different earlier reports (Aklilu and Catley, 2009; Upton, 2014; IGAD 2013; Wannous and Nabarro, 2014). A report by IGAD (2013) addressed the unaccounted contribution of livestock to agriculture sector in the forms of manure for soil fertility improvement, draught power for cultivation of land and transportation of agricultural and non-agricultural products to and from market. Therefore the current results are in line with previous reports.

It was also found in this study that import of live animals in the COMESA member countries significantly explains 2% of the variation in GDP. Live animals are imported for the purpose of consumption as well as parent breeding stock for rearing animals for later consumption. The data used for this analysis was total value of imports in USD for live animal import and does not differentiate between livestock species. Nevertheless, a significant causal effect was observed of live animal imports on economic growth. Import of live animals, for instance cattle, can be beneficiary as it gives option to further produce products such as milk, meat and hides that give way to further economic activities and income. On the contrary, export of live animals without cuts the benefits of value addition and may render less than expected contribution to economic growth. Taking cattle export for example, is subject to a number of sanitary and phyto-sanitary regulations, less value to volume ratio, and cuts the benefit of producing beef, hide and other by products within the boundaries (Wannous and Nabarro, 2014). This means that exporting products could have contributed better to the economic growth than live cattle export by creating more jobs and income along the beef and leather value chains.

Animal product international trade in COMESA region has significant impact on economic growth, which has explained 29% and 12% of variation in GDP, by import and export, respectively, in the current study. The animal products considered in the current study are dairy products, eggs, meat and raw hides and skins. Arega (2011) tested the relationship between trade openness and economic growth using data from agricultural trade between 47 SSA countries and the West and reported positive association between economic growth and international trade which is in line with the current study results.

The current results that showed higher contribution by import of products than exports in explaining economic growth in COMESA member countries indicate that this theme needs further study as to the determinants of agricultural products trade in the region. Some presumptive explanations worth discussing are the fact that most of the countries in the region have less developed agroindustry to add value to primary products and the fact that more countries are in negative trade balance of products than live animal (63% vs. 54%).

Theoretically, free trade promotes welfare in both the importing and exporting countries that have either absolute or comparative advantages through. As being composed of countries with dominant primary product exporters, COMESA region has less comparative advantage in terms of processed commodities such as dairy products, meat and eggs that require more capital than labor and land to produce and trade.

CHAPTER 5.

5. CONCLUSION AND RECOMMENDATION

5.1 Summary of findings

This study was conducted to identify and quantify the impact of live animal and animal products trade in the economic growth of the COMESA regional bloc. After analyzing 28 years secondary data on production, import and export of live animal and products from 11 COMESA member countries, the following points summarize the key findings.

Livestock sector comprises 28% of agricultural production in value in the COMESA region which shows that the sub-sector is important for the economy of the region. Most of the members of COMESA regional integration are in negative trade balance in terms of live animal and animal products trade. The negative balance of trade observed in majority of the COMESA member countries in the current study signals COMESA member nations trade mostly with the rest of the world. This in turn indicates a potential to develop the intra-regional trade for live animal and products.

There is a growing trend in live animal and products international trade in the COMESA region which is accelerated by the COMESA FTA facilitation. Moreover, membership to FTA of COMESA has highly significant correlation between animal product import and GDP and less significant correlation with import of live animals and export of animal products.

Economic growth, as measured by GDP, is significantly determined by livestock production value, live animal import value, animal products import and animal products import, but not by live animal export in the COMESA region.

5.2 Conclusion

From the abovementioned findings of this study the following conclusions are drawn. Livestock production and trade has important contribution to economic growth of nations in COMESA regional bloc. It is significant enough to deserve attention from national policy makers as well as regional institutions that endeavor development of the region and the respective countries that constitute COMESA.

Membership to the free trade area of COMESA positively affects growth of economy as well as livestock and products international trade. Therefore COMESA member nations that are not yet FTA members such as Eritrea and Ethiopia are losing the trade facilitation benefits of COMESA.

COMESA establishment has positively affected the trends of live animal and products trade. However, most of the members are still in negative balance of trade which signals a higher proportion trade with non-member countries.

Economic growth as measured in GDP is significantly determined by livestock production, live animal imports, animal products imports and exports in COMESA member countries. Even though the agricultural sector in general has the least contribution compared to manufacturing and service in COMESA region, its growth has important purpose to economic growth, as empirical evidence shows in this study.

5.3 Recommendations

The above conclusions lead to the following recommendations. The positive association between live animal and animal products import and export in COMESA region should be promoted with institutional and policy infrastructures to enhance economic growth of nations in the region. Supporting policies are required to be crafted and enforced to further exploit the potential of livestock sub-sector for the development of the economy of nations in COMESA region. Countries with livestock resource endowments, especially Ethiopia and Sudan should device more convenient systems through policies and institutions that implement them in favor of livestock value chains to contribute more to the development of their economy.

COMESA members that are not yet member of the FTA of the region, namely Eritrea and Ethiopia, should become members of the FTA and benefit from the trade facilitation the regional bloc offers. Regional economic integration is eminent in the globalizing world and, thus, nations should prepare themselves towards joining such beneficial trade blocs.

Further research should be conducted to identify which export destinations and commodities have the higher advantage for the members of COMESA. In addition determinants of live animal and products trade and economic growth in the COMESA region should be conducted to strengthen the knowledge base of the sector in the region.

REFERENCES

- Abdulai, A. and Jaquet, P. (2002). Exports and Economic Growth: Cointegration and Causality Evidence for Cote D'Ivoire. *African Development Review*, 14(1), 1-17.
- Alreck, P. L. and Settle, R. B. (1995). *The Survey Research Handbook* (2nd ed.), Chicago: Irwin.
- Arega, Henok. 2011. *Trade Policy and Economic Growth in Sub Saharan Africa: A panel data approach*. Addis Ababa University. f
- Badiane, Ousmane, Odjo, Sunday, and Collins, Julia (Eds). 2018. *Africa Agriculture Trade Monitor Report 2018*. Washington,DC: International Food Policy Research Institute (IFPRI).
- Behnke, F. and Fitaweke Metaferia. 2013. *The Contribution of Livestock to the Ethiopian Economy – Part II. IGAD Livestock Policy Initiative*. Working Paper Working Paper No. 02 – 11.
- Christian Bjornskov. 2005. *Basics of international economics*. Compendium-Ventus publishing aps.
- CIA. 2019. *The CIA World Factbook*. Central Intelligence Agency. USA.
- Cleaver, K.M. (1985), "The Impact of price and Exchange Rate Policies on Agriculture in Sub-Saharan Africa", *World Bank Staff Working Papers*, Washington, D.C.
- COMESA. 2019. *Common Market for Eastern and Southern Africa: Company Overview*. <https://www.comesa.int/company-overview-2/> last retrieved on April 19, 2019.
- EU 2018. *AGRI-FOOD TRADE STATISTICAL FACTSHEET*; European Union - Sub-Saharan Africa Directorate-General for Agriculture and Rural Development. Retrieved online on December 2018.
- FAO. 1994. *Definition and classification of commodities*. Food and Agricultural Organization of the United Nations. Rome, Italy. <http://www.fao.org/waicent/faoinfo/economic/faodef/fdef16e.htm> last accessed on April 22, 2019.
- Fouquin, Michel & Hugot, Jules. 2016. "Two Centuries of Bilateral Trade and Gravity Data: 1827-2014," http://www.cepii.fr/cepii/en/bdd_modele/presentation.asp?id=32CEPII Working Paper 2016- 14, CEPII. IMF.
- Frimpong Magnus, J., & Oteng-Abayie, E. 2006. *Bounds Testing Approach: An Examination of Foreign Direct Investment, Trade, and Growth Relationships*.
- Garrigus, W. P. and Holden, P. J. 2018. *Livestock Farming*. In. *Encyclopedia Britannica*. <https://www.britannica.com/topic/livestock-farming> last accessed on April 22, 2019.
- Geboye, Melaku. 2007. *The Regulatory Framework for Trade in IGAD Livestock Products*. IGAD LPI Working Paper No. 07 – 08.
- Goodhope, O.O. 2014. *Trade Liberalization in ECOWAS Sub Region: Implication for National Economic Development and Emancipation*. *Journal of Economics and Sustainable Development*. ISSN 2222-2855 (Online) Vol.5, No.7, 2014
- Gujarati, D. (2004), 'Basic Econometrics', 4th Ed., the McGraw Hill Company
- Gujarati, Damodar. 2011. *Econometrics by example*. Palgrave MacMillan. USA.

- Hamburg University. 2009. Theory and Practice of International Trade. Hamburg University of Applied Sciences.
- Hitt, M.A. (2006), Strategic Management 2nd Ed. Minneapolis: West Publishing Company.
- IGAD, 2013. The contribution of livestock to the Ethiopian economy policy brief series. IGAD center for pastoral areas & livestock development (ICPALD) policy brief no: ICPALD 5/CLE/8/2013
- IGAD. 2014. GOOD PRACTICES and LESSONS IN THE VALUE CHAIN OF HIDES AND SKINS IN IGAD REGION. Intergovernmental Authority on Development (IGAD), Center for Pastoral Area and Livestock Development (ICPALD). Study report.
- Imi, Atsushi. 2007. Infrastructure and trade preferences for the livestock sector: empirical evidence from the beef industry in Africa. World Bank policy research working paper 4201. Last accessed on January 9, 2019. <http://documents.worldbank.org/curated/en/423691468010012097/pdf/wps4201.pdf>
- Imam, A., Zadeh, M. N., and Dubey, L. R. 2011. Dairy Marketing Strategies in the Context of Globalization: Issues and Challenges. International Journal of Trade, Economics and Finance, Vol. 2, No. 2. Pp 138-143.
- Kareem, I.O. 2009. "Trade Restrictions and Africa's Exports", Paper Presented at the Center for the Studies of African Economies conference, No.113675, University of Ibadan, Ibadan, Nigeria.
- Kehinde, A. O., Jubril, A. O., & Felix, A. O. (2012). Foreign trade and economic growth in Nigeria: An empirical analysis. American Academic & Scholarly Research Journal, 4(5), 1.
- Kenya, (Undated). INTERNATIONAL TRADE OF LIVESTOCK AND LIVESTOCK PRODUCTS <http://phpt.uonbi.ac.ke/sites/default/files/cavs/vetmed/phpt/INTERNATIONAL%20TRADE%20F%20LIVESTOCK%20AND%20LIVESTOCK%20PRODUCT1.pdf>
- Kim, D. H., & Lin, S. C. 2009. Trade and growth at different stages of economic development. Journal of Development Studies, 45(8), 1211-1224.
- Krugman, P. R., Obstfeld, M., and Melitz, M. J. 2012. International economics; theory and policy. 9th ed. Pearson Education Inc. USA.
- Lopez, R.A. 2005. Trade and Growth: Reconciling the Macroeconomic and Microeconomic Evidence. Journal of Economic Surveys. Volume 19. Issue 4.
- Malhotra, N.K. and Peterson, M. (2006). Basic marketing research: A decision making approach (2d ed.) Upper Saddle River, NJ: Prentice Hall.
- Mazumder, Sandeep. 2017. The Impact of Globalization on Inflation in Developing Countries. Journal of Economic Development. Volume 42, Number 3, pp 41.
- Nafziger, E. Wayne. 2006. Economic Development. 4th Edition. Cambridge University Press. USA.
- Neuman, W.L. 2014. Social Research Methods: Qualitative and Quantitative Approaches. Pearson New International Edition. USA
- Ntara, Caroline. 2016. African trading blocs and economic growth: a critical review of the literature. International journal of developing and Emerging Economies. Vol. 4, No. 1, pp. 1-21.

- Ortiz-Ospina, E., Beltekian, D. and Roser, M. 2018. Trade and Globalization. Our World in Data. <https://ourworldindata.org/trade-and-globalization#trade-openness-around-the-world> last retrieved on June 1, 2019.
- Ouma, D. Kimani, T. and Manyasa, E. 2016. Agricultural Trade and Economic Growth in East African Community. *African Journal of Economic Review*, Volume IV, Issue 2, July 2016.
- Reuters 2015, Mega African Trade Bloc Paves Way for Continental Commerce, viewed March 2019, <http://uk.reuters.com/article/2015/06/11/uk-africa-tradedUKKBN0OR28M20150611>>
- Rochester, J.M. (2003), *Waiting for the Millennium, the UNO and the Future of World Order*, Carolina: University Press.
- Sheridan, Brandon James, "THREE ESSAYS CONCERNING THE RELATIONSHIP BETWEEN EXPORTS, MACROECONOMIC POLICY, AND ECONOMIC GROWTH" (2012). Theses and Dissertations--Economics. 7. https://uknowledge.uky.edu/economics_etds/7
- Todaro, Michael P. and Smith, Stephen C. 2012. *Economic Development*. 11th Edition. Addison-Wesley. Pearson Education, Inc., USA.
- Umar, U. (2009). The Impact of Banking Industry Recapitalization on Employment in Nigerian Banks. *European Journal of Social Sciences*, 11 (3): 486 - 495.
- UNECA. 2013. *Harmonizing Policies to Transform the Trading Environment; Assessing Regional Integration in Africa*. United Nations Economic Commission for Africa, VI. www.uneca.org
- Upton, M. 2014. *The Role of Livestock in Economic Development and Poverty Reduction*. PPLPI Working Paper No. 10. Pro-Poor Livestock Policy Initiative. <https://www.researchgate.net/publication/23510344>.
- Verbeek, Marno (2000), *'A Guide to Modern Econometrics'*. 2nd Ed. John Wiley and Sons, Ltd. New York, USA.
- Wannous, C. and Nabarro, D. 2014. The potential contribution of livestock to food and nutrition security: the application of the One Health approach in livestock policy and practice. *Rev. sci. tech. Off. int. Epiz.*, 2014, 33 (2), 475-485
- Wooldridge, J. M. (2004), *'Introductory Econometrics: A Modern Approach'*, Cincinnati, OH: South Western.
- World Bank. 2000. *Trade Blocs*. World Bank Policy research report.
- World Bank. 2018. <http://data.worldbank.org/data-catalog/world-development-indicators>

Annex 1. Post Estimation Tests

Annex 1.1 Unit Root Test Results

a. lnGDP

Harris-Tzavalis unit-root test for lngdp

Ho: Panels contain unit roots Number of panels = 11
 Ha: Panels are stationary Number of periods = 28

AR parameter: Common Asymptotics: N -> Infinity
 Panel means: Included T Fixed
 Time trend: Not included

	Statistic	z	p-value
rho	0.9937	2.9859	0.9986

b. lnLSPROD

Harris-Tzavalis unit-root test for lnlsprod

Ho: Panels contain unit roots Number of panels = 11
 Ha: Panels are stationary Number of periods = 28

AR parameter: Common Asymptotics: N -> Infinity
 Panel means: Included T Fixed
 Time trend: Not included

	Statistic	z	p-value
rho	0.9763	2.4512	0.9929

c. lnIMPLA

Levin-Lin-Chu unit-root test for lnimpla

Ho: Panels contain unit roots Number of panels = 11
 Ha: Panels are stationary Number of periods = 28

AR parameter: Common Asymptotics: N/T -> 0
 Panel means: Included
 Time trend: Not included

ADF regressions: 1 lag

LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-5.2400	
Adjusted t*	4.2598	1.0000

d. lnEXPLA

Levin-Lin-Chu unit-root test for lnexpla

Ho: Panels contain unit roots Number of panels = 11
Ha: Panels are stationary Number of periods = 28

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-5.9535	
Adjusted t*	2.4502	0.9929

e. lnPIMP

Levin-Lin-Chu unit-root test for lnPIMP

Ho: Panels contain unit roots Number of panels = 11
Ha: Panels are stationary Number of periods = 28

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-3.2551	
Adjusted t*	-0.3166	0.3758

f. lnPEXP

Im-Pesaran-Shin unit-root test for lnPEXP

Ho: All panels contain unit roots Number of panels = 11
Ha: Some panels are stationary Number of periods = 28

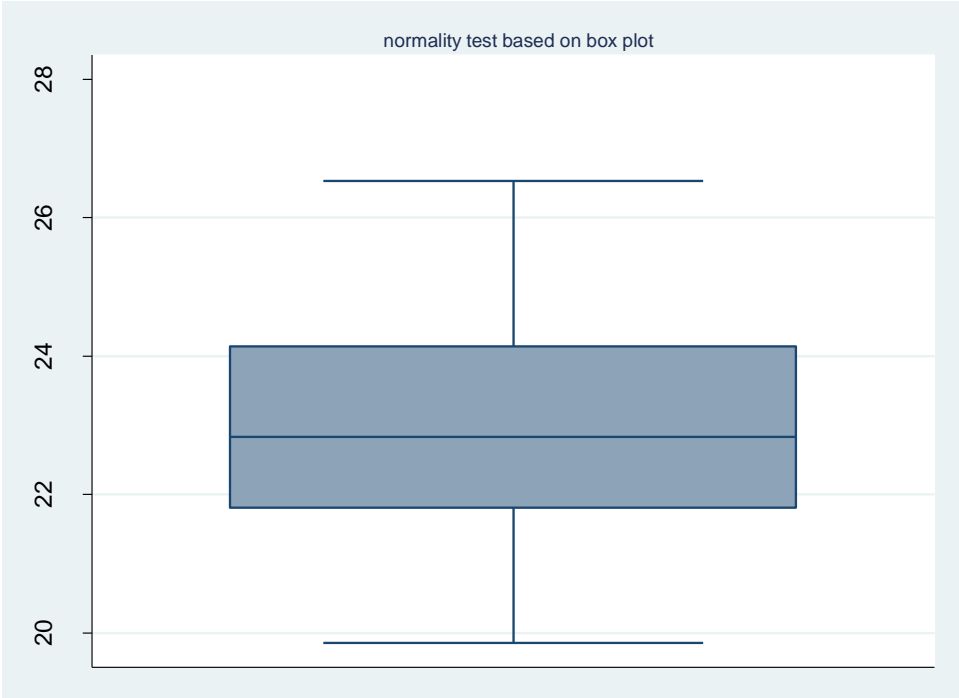
AR parameter: Panel-specific Asymptotics: T,N -> Infinity
Panel means: Included sequentially
Time trend: Not included

ADF regressions: 1 lag

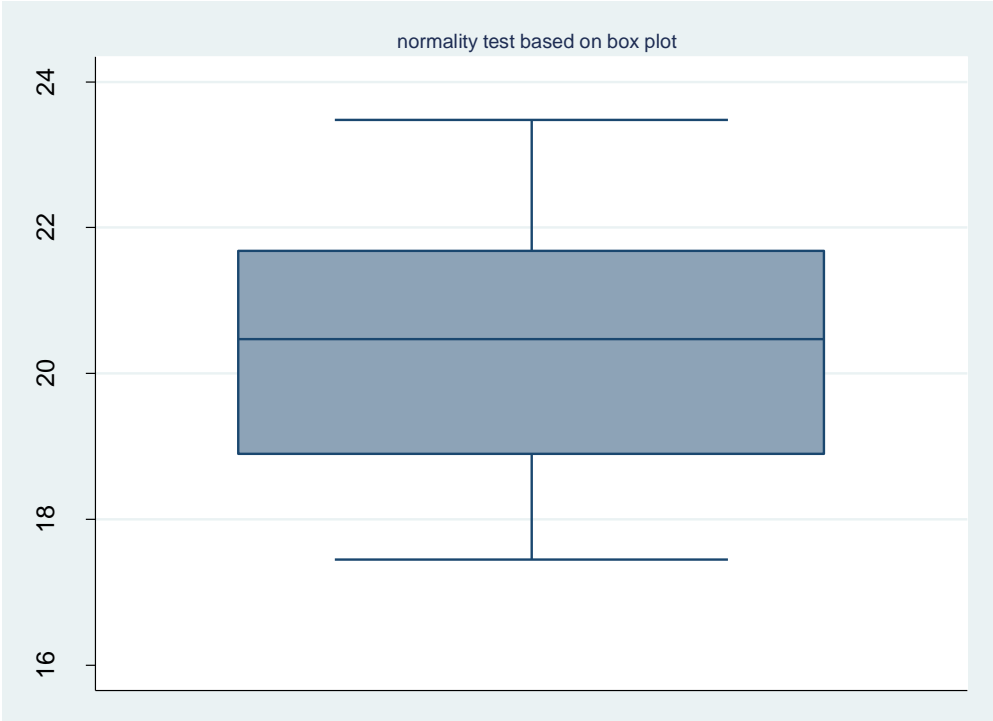
	Statistic	p-value
W-t-bar	-1.6310	0.0514

Annex 1.2. Distribution Normality Test

a. Box plot normality distribution test for lnGDP



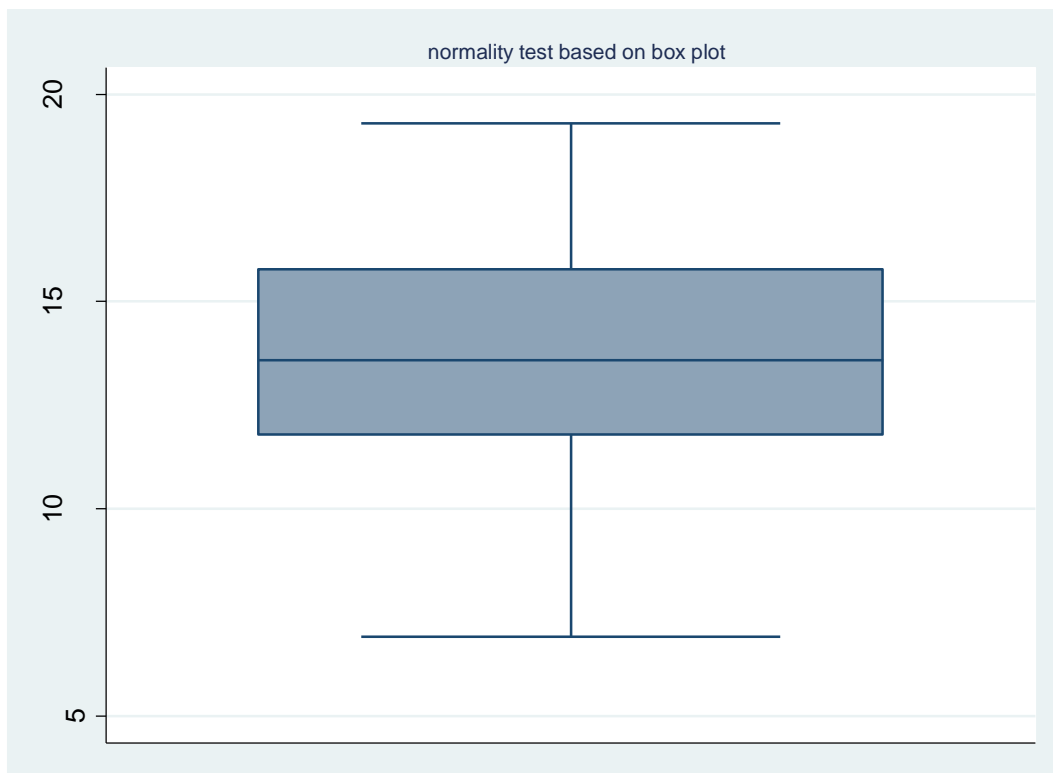
b. Box plot normality distribution test for lnLSPROD



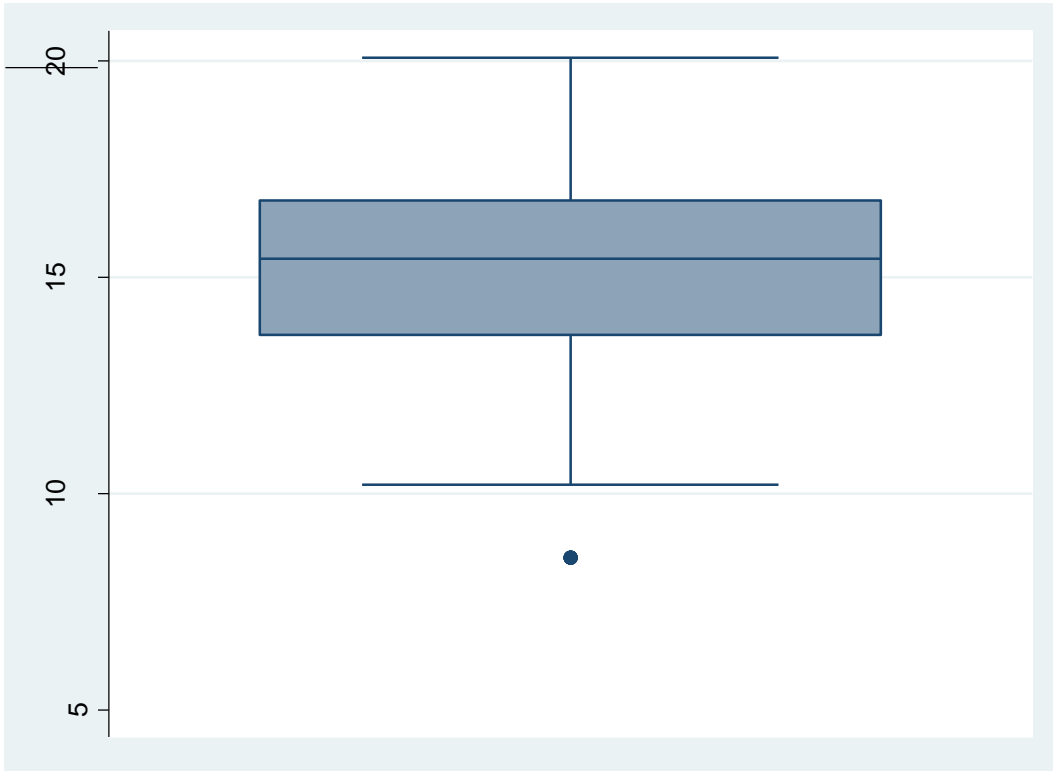
c. Box plot normality distribution test for lnEXPLA



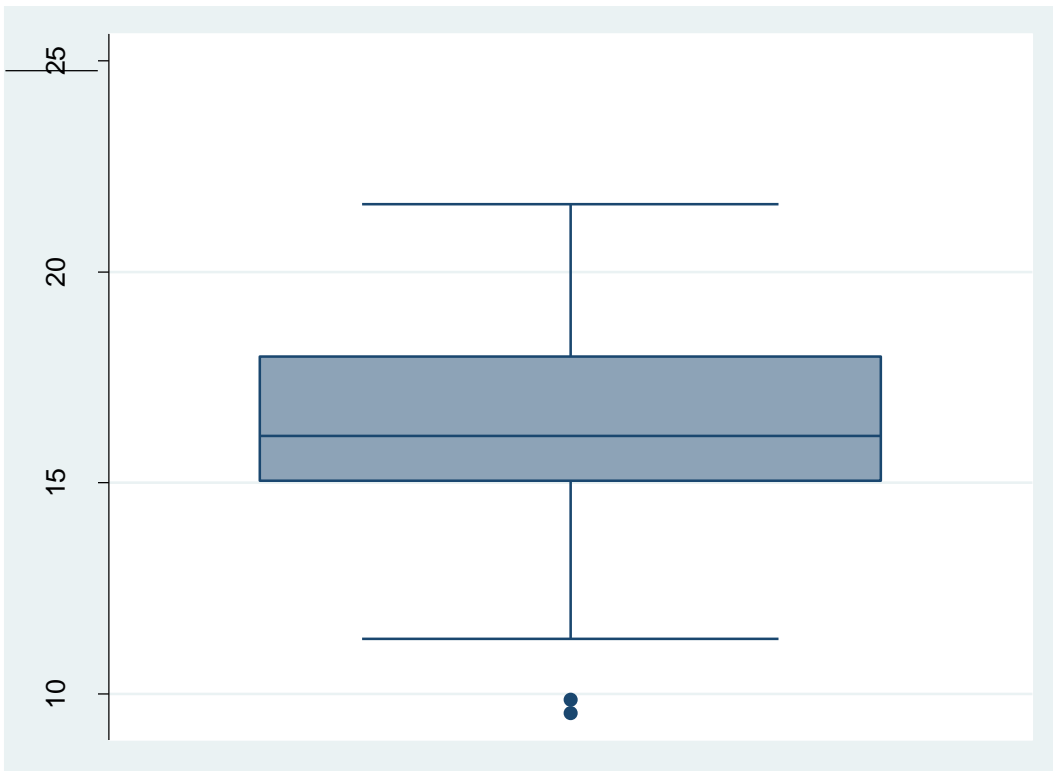
d. Box plot normality distribution test for lnIMPLA



e. Box plot normality distribution test for lnPEXP



f. Box plot normality distribution test for lnPIMP



Annex 1.3 Test for multicollinearity

. vif

Variable	VIF	1/VIF
lnPEXP	2.69	0.372294
lnimpla	2.42	0.412421
lnlsprod	2.36	0.423051
lnPIMP	2.16	0.464000
lnexpla	2.10	0.475454
Mean VIF	2.35	

Annex 1.4 Hausman Specification Test

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fixed	(B) random		
lnlsprod	.8160347	.7484601	.0675746	.0107598
lnimpla	.0062023	.0096808	-.0034785	.
lnexpla	.0007619	-.0016921	.002454	.
lnPIMP	.1228428	.1711816	-.0483388	.0068077
lnPEXP	.0182446	.0290692	-.0108246	.

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = 45.52
 Prob>chi2 = 0.0000
 (V_b-V_B is not positive definite)

Annex 1.5 Heteroscedasticity test

White's test for Ho: homoskedasticity
 against Ha: unrestricted heteroskedasticity

chi2(104) = 195.83
 Prob > chi2 = 0.0000

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	195.83	104	0.0000
Skewness	34.17	13	0.0011
Kurtosis	1.70	1	0.1926
Total	231.70	118	0.0000

```

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of lngdp

chi2(1)      =      4.60
Prob > chi2  =      0.0321

```

```

Fixed-effects (within) regression           Number of obs   =      308
Group variable: CountryID                  Number of groups =      11

R-sq:                                       Obs per group:
  within = 0.8189                           min =          28
  between = 0.8444                           avg =         28.0
  overall = 0.8389                           max =          28

corr(u_i, Xb) = -0.1537                     F(5,292)        =      264.14
                                                Prob > F         =      0.0000

```

lngdp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnlsprod	.8160347	.0339716	24.02	0.000	.7491746	.8828949
lnimpla	.0062023	.0087083	0.71	0.477	-.0109367	.0233413
lnexpla	.0007619	.0083727	0.09	0.928	-.0157165	.0172403
lnPIMP	.1228428	.0234567	5.24	0.000	.0766772	.1690083
lnPEXP	.0182446	.0137801	1.32	0.187	-.0088764	.0453655
_cons	3.895699	.5433747	7.17	0.000	2.826272	4.965127
sigma_u	.57447129					
sigma_e	.29138496					
rho	.79537093	(fraction of variance due to u_i)				

F test that all u_i=0: F(10, 292) = 36.11 Prob > F = 0.0000

Annex 1.6 Estimation results

Cross-sectional time-series FGLS regression

Coefficients: generalized least squares
Panels: homoskedastic
Correlation: no autocorrelation

```

Estimated covariances   =      1      Number of obs   =      308
Estimated autocorrelations =      0      Number of groups =      11
Estimated coefficients   =      6      Time periods    =      28
                                                Wald chi2(5)    =      3656.57
Log likelihood           = -172.9951      Prob > chi2     =      0.0000

```

lngdp	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnlsprod	.4995775	.0233719	21.38	0.000	.4537695	.5453855
lnimpla	.0189205	.0111982	1.69	0.091	-.0030275	.0408685
lnexpla	-.0078004	.0092482	-0.84	0.399	-.0259266	.0103258
lnPIMP	.2967135	.0175781	16.88	0.000	.262261	.331166
lnPEXP	.1239418	.0168565	7.35	0.000	.0909037	.15698
_cons	5.833771	.3492869	16.70	0.000	5.149181	6.518361

Annex 2. Livestock Commodity Definition

COMMODITY	DEFINITIONS, COVERAGE, REMARKS
CATTLE common ox (<i>Bos taurus</i>); zebu, humped ox (<i>Bos indicus</i>); Asiatic ox (<i>subgenus Bibos</i>); Tibetan yak (<i>Poephagus grunniens</i>)	Animals of the genus listed, regardless of age, sex, or purpose raised. Data are expressed in number of heads.
SHEEP <i>Ovis spp.</i>	Includes Uriel, Argali, Bighorn, Karakul and Astrakhan.
GOATS <i>Capra spp.</i>	Includes Hircus, Ibex, Nubiana, Pyrenaica, Tibetana, Kashmir and Angora.
PIGS domestic pig (<i>Sus domestica</i>); wild boar (<i>Sus scrofa</i>)	Excludes non-domesticated wild boars.
CHICKENS fowl (<i>Gallus domesticus</i>); Guinea fowl (<i>Numida meleagris</i>)	
DUCKS <i>Anas spp.</i>	
GEESE <i>Anser spp.</i>	
TURKEYS <i>Meleagris gallopavo</i>	
HORSES <i>Equus caballus</i>	
ASSES <i>Equus asinus</i>	
MULES Includes hinnies. Mules are offspring of a male ass and a female horse (mare); a hinny is the offspring of a female ass and a male horse (stallion). Both are sterile.	
CAMELS Bactrian camel (<i>Camelus bactrianus</i>); Arabian camel (<i>C. dromedarius</i>)	
BEEHIVES <i>Apis mellifica</i> ; <i>A. dorsata</i> ; <i>A. florea</i> ; <i>A. indica</i>	A beehive is an artificial habitation for bees.

Source: FAO 1994.

Declaration

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Maru Shete (Ph.D.). All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

Binyam Kassa Engidasew

Name

St. Mary's University, Addis Ababa

Signature

July, 2019.

ENDORSEMENT

This thesis has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

Maru Shete (Ph.D.)

Advisor

Signature