

**EFFECT OF MACRO-ECONOMIC VARIABLES ON KENYA'S  
MANUFACTURED EXPORTS TO UGANDA AND TANZANIA**

**ELLAM OSABWA OMUHINDA**

**A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of  
the Masters of Science Degree in Economics of Masinde Muliro University of  
Science and Technology.**

**September, 2025**

## DECLARATION

This thesis is my original work and has not been presented for a degree or any other award in any other university.

**Signed**.....

**Date**.....

Ellam Osabwa Omuhinda

REG NO: ECO/G/01-53840/2019

## CERTIFICATION

The undersigned certify that they read and at this moment recommend for acceptance of Masinde Muliro University of Science and Technology thesis entitled “*Effect of macro-economic variables on Kenya’s manufactured exports to Uganda and Tanzania*”

**Signed**.....

**Date**.....

Dr. Reuben Rutto

Department of Economics

Masinde Muliro University of Science and Technology

**Signed**.....

**Date**.....

Prof. John Byaruhanga

Department of Economics

Masinde Muliro University of Science and Technology

## **COPYRIGHT**

This thesis is copyrighted material protected under the Berne Convention, the Copyright Act 1999, and other International and National enactments on behalf, of intellectual property rights. It may not be reproduced by any means in full or in part, except for short extracts in fair dealing for research or private study, critical scholarly work, reviews, or disclosure with acknowledgement and written permission from the Dean School of Postgraduate Studies on behalf of both the author and Masinde Muliro University of Science and Technology.

## **ACKNOWLEDGEMENT**

I am grateful to God for giving me the strength and wisdom to pursue a Master of Science degree in Economics at Masinde Muliro University of Science and Technology. I owe a debt of gratitude to Dr. Reuben Rutto, Prof. John K. Byaruhanga and the faculty for their guidance in drafting this proposal. Their input added value to my knowledge. Thanks to my mother for her support and my wife, Hilda Makokha Tanga, for her calmness and help during this journey. May the Almighty God bless you!

## **DEDICATION**

This proposal is dedicated to the most important people in my life: my mother Joyce and my wife Hilda. I extend this dedication to all the individuals who never give up, regardless of the obstacles facing them. Keep walking! You'll get it.

## ABSTRACT

The first of the big four pillars in the Third Medium Term Plan (MTP) (2018-2022) of Vision 2030 was manufacturing. Its adoption would not only facilitate higher economic growth and quicker job creation but also lower high cost of living by helping to reduce the high quality of life of all citizens by contributing at least 15 per cent of Kenya GDP p.a. However, there was little data on the contribution of different macroeconomic aggregates to the growth of the manufactured exports in the country hence; a knowledge gap to the policymakers in making serious decisions to enhance the growth of manufactured exports in Kenya. This study, thus, sought to determine the effect of four macroeconomic variables (capital expenditure (KXM), domestic debt (DMD), population size (POP) and standard of living (DGC)) on Kenya's manufactured exports to Uganda and Tanzania. The specific objectives of this study were to: determine the effect of capital expenditure on Kenya's manufactured exports to Uganda and Tanzania, to analyze the effect of domestic debt on Kenya's manufactured exports to Uganda and Tanzania, to establish the effect of population size on Kenya's manufactured exports to the Uganda and Tanzania and examine the moderating effect of standard of living on the macroeconomic aggregates on the Kenya's manufactured exports to Uganda and Tanzania. This study further sought to conduct four separate hypothesis tests to establish if there is a statistically significant effect of KXM, DMD, POP, and DGC on Kenya's manufactured exports to Uganda and Tanzania. The study focused on the period 2008-2017 because 2007 was the period when the EAC was formed and, therefore, most of the data was available from the three founding states, while 2018 was the beginning of the MTP III, which prioritized manufacturing. This study was anchored on Linder's hypothesis of trade and employed the gravity model. It adopted a correlational study design and relied on secondary panel data from the World Bank, Central Bank of Kenya, Kenya National Bureau of Statistics and Kenya Export Promotion and Branding Agency, which was analyzed using Stata software. Descriptive statistics were computed to observe the general trend of sample variables. According to the equation, both random and fixed effect models were estimated. The Hausman test was then used to determine the best model to select the random effect model. Results of the random effect model for Kenya's exports to Uganda and Tanzania indicated that the effect of KXM was positive and significant ( $\beta_3 = 0.588$ , p-value  $0.000 < 0.05$ ), DMD had a negative and significant effect ( $\beta_4 = -0.207$ , p-value  $0.002 < 0.05$ ), POP had a positive and significant effect ( $\beta_5 = 0.208$ , p-value  $0.002 < 0.05$ ) and lastly, DGC had a negative and significant effect ( $\beta_7 = -0.267$ , p-value  $0.000 < 0.05$ ). The addition of a moderating variable, DGC, in the model increased the value of the overall  $R^2$  from 0.783 to 0.798, meaning that the intervention of DGC causes independent variables to jointly explain variation in the dependent variable by an additional 0.015 units. This study therefore recommended that the Government of Kenya and other stakeholders invest more in education, healthcare, and R&D, incentivize novel sectors like the information and communication technology sector and deter corruption in development projects. Additionally, the government of Kenya should comply with the PFM Act public finance principle of solely using debt on development projects and sourcing for cheaper yet long-term foreign debt instead of domestic debt.

## TABLE OF CONTENTS

<b>DECLARATION .....</b>	<b>II</b>
<b>COPYRIGHT.....</b>	<b>III</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>IV</b>
<b>DEDICATION .....</b>	<b>V</b>
<b>ABSTRACT.....</b>	<b>VI</b>
<b>TABLE OF CONTENTS.....</b>	<b>VII</b>
<b>LIST OF TABLES .....</b>	<b>XII</b>
<b>LIST OF FIGURES .....</b>	<b>XIII</b>
<b>LIST OF EQUATIONS .....</b>	<b>XIV</b>
<b>ABBREVIATIONS AND ACRONYMS .....</b>	<b>XV</b>
<b>OPERATIONAL DEFINITION OF TERMS .....</b>	<b>XVIII</b>
<b>CHAPTER ONE .....</b>	<b>1</b>
<b>INTRODUCTION.....</b>	<b>1</b>
1.1 Background of the Study .....	1
1.2 Statement of the Problem .....	6
1.3 Objectives of the study .....	8
1.3.1 General Objective.....	8
1.3.2 Specific Objectives.....	8
1.4 Research Hypothesis .....	8
1.5 Significance of the Study .....	9
1.6 Scope of the Study.....	10
1.7 Limitations of the Study .....	11
<b>CHAPTER TWO .....</b>	<b>13</b>
<b>LITERATURE REVIEW.....</b>	<b>13</b>
2.1 Overview of Chapter .....	13

2.2 Theoretical Literature .....	13
2.2.1 Comparative Advantage Theory of Trade .....	13
2.2.2 Heckscher–Ohlin (H-O) Theory .....	17
2.2.3 Linder Hypothesis (1961).....	19
2.3 Conceptual Review of Study Variables.....	24
2.3.1 Capital Expenditure .....	24
2.3.2. Domestic Debt .....	24
2.3.3. Population.....	25
2.3.4 Standard of Living.....	25
2.3.5 Manufactured exports.....	26
2.4. Empirical Literature Review .....	26
2.4.1 Capital Expenditure and Manufactured Exports .....	26
2.4.2 Domestic Debt and Manufactured Exports .....	31
2.4.3 Population Size and Manufactured Exports .....	36
2.4.4 Standard of Living and Manufactured Exports .....	40
2.5 Summary of Literature Review .....	42
2.6 Conceptual Framework .....	51
<b>CHAPTER THREE .....</b>	<b>53</b>
<b>RESEARCH METHODOLOGY .....</b>	<b>53</b>
3.1 Overview of the Chapter .....	53
3.2 Research Design .....	53
3.3 Study Area	54
3.4 Data Description, Measurement and Sources.....	55
3.5 Data Processing and Analysis .....	56
3.6 Data presentation .....	56
3.7 Descriptive statistics.....	57
3.8 Correlation Analysis.....	57

3.9 Model Specification .....	58
3.9.1 Basic Gravity Model .....	59
3.9.2 Augmented Gravity Model.....	61
3.10 Panel Unit Root Tests.....	63
3.10.1 Levin-Lin-Chu Test.....	63
3.10.2 Harris-Tzavalis Test .....	64
3.11 Hausman Test.....	64
3.12 Descriptive Statistics .....	64
3.13 Post-Diagnostic Tests .....	67
3.13.1 Multi-collinearity.....	67
3.13.2 Woolridge Test for Serial Correlation.....	68
3.13.3 Cook-Weisberg/ Breusch-Pagan Test for Heteroscedasticity .....	68
3.14 Ethical Considerations.....	69
<b>CHAPTER FOUR.....</b>	<b>70</b>
<b>DATA ANALYSIS, PRESENTATION AND DISCUSSION .....</b>	<b>70</b>
4.1 Overview of the Chapter .....	70
4.2 Pre-Estimation Checks .....	70
4.2.1 Visual Presentation of Variables .....	70
4.2.2 Correlation Analysis.....	75
4.2.3 Panel Unit Root Tests.....	76
4.3 Hausman Test.....	77
4.4 Random Effect Model Regression, Discussions of the Findings and Test of Hypotheses.....	78
4.4.1 Objective One: Capital Expenditure (KXM) and Manufactured Exports (MXE).....	80
4.4.2 Objective Two: Domestic Debt (DMD) and Manufactured Exports (MXE).82	
4.4.3 Objective Three: Population size (POP) and Manufactured Exports (MXE) 86	
4.4.4 Dummy Variables.....	88

4.4.4.1 Non-Tariff Barriers.....	89
4.4.4.2 Illicit Trade .....	92
4.4.4.3 Linder’s Hypothesis .....	93
4.4.5 Gravity Model .....	93
4.4.6 The Moderating Effect of Standard of Living (DGC) on the Association between Macro-Economic Variables and Kenya’s Manufactured Exports (MXE) to Uganda and Tanzania.....	95
4.4.6.1 Discussion of the Moderating Effect of Standard of Living (DGC) .....	97
4.4.7 Testing Linder’s Hypothesis .....	98
4.5 Post-Estimation Diagnostic Tests.....	100
4.5.1 Test for Multicollinearity .....	100
4.5.2 Wooldridge Test for Autocorrelation .....	101
4.5.3 Cook-Weisberg/Breusch-Pagan Test for Heteroscedasticity .....	102
<b>CHAPTER FIVE.....</b>	<b>103</b>
<b>SUMMARY, CONCLUSION AND POLICY RECOMMENDATION .....</b>	<b>103</b>
5.1 Overview of the Chapter .....	103
5.2 Summary of the Findings .....	103
5.2.1 Effect of Capital Expenditure on Manufactured Exports.....	104
5.2.2 Effect of Domestic Debt on Manufactured Exports.....	105
5.2.3 Effect of Population Size on Manufactured Exports.....	105
5.2.4 Gravity Model .....	106
5.2.5 The Moderating Effect of Differential GDP per Capita (DGC) on the Association between Macroeconomic Aggregates and Manufactured Exports.....	106
5.2.6 The Linder’s Hypothesis .....	107
5.3 Conclusion	107
5.4 Policy Recommendations .....	108
5.4.1 Capital Expenditure .....	108

5.4.2 Domestic Debt.....	108
5.4.3 Population Size.....	108
5.4.4 Standard of Living.....	109
5.5 Areas for Further Research.....	109
<b>REFERENCE.....</b>	<b>111</b>
<b>APPENDICES.....</b>	<b>127</b>
APPENDIX I: STUDY AREA- THE MAP OF EAST AFRICA.....	127
APPENDIX II: DATA .....	128
APPENDIX III: UNIT ROOT TESTS .....	129
APPENDIX IV: VARIANCE BETWEEN KENYA’S CAPITAL EXPENDITURE AND TOTAL DEBT .....	130
APPENDIX V: EAC GDP per Capita, PPP (Current International, USD).....	131
APPENDIX VI: FIXED EFFECT REGRESSIONS.....	133
APPENDIX VII: MMUST PERMIT .....	134
APPENDIX VIII: NACOSTI LICENSE .....	135

## LIST OF TABLES

Table 2. 1: Empirical Literature Matrix .....	43
Table 3. 1: Summary of Variables Used in the Study.....	55
Table 4. 1: Descriptive Statistics .....	65
Table 4. 2: Correlation Analysis .....	75
Table 4. 3: Unit Root Tests .....	77
Table 4. 4: Hausman Test .....	78
Table 4. 5: Random Effect Regression Results .....	79
Table 4. 6: Random Effect Regression Output With DGC As A Moderating Variable .....	96
Table 4. 7: VIF Test For Multicollinearity .....	100
Table 4. 8: Test for Serial Autocorrelation .....	101
Table 4. 9: Breusch-Pagan / Cook-Weisberg Test Results .....	102

## LIST OF FIGURES

Figure 2. 1: Conceptual Framework .....	51
Figure 4. 1: Graphical Presentation of Variables.....	70

## LIST OF EQUATIONS

<b>Equation 1:</b> Levin-Lin-Chu Model	63
<b>Equation 2:</b> Model Specification I	58
<b>Equation 3:</b> Model Specification II	58
<b>Equation 4:</b> Basic Model in Linear Form	59
<b>Equation 5:</b> Basic Gravity Model	60
<b>Equation 6:</b> Augmented Gravity Model	62
<b>Equation 7:</b> VIF	67
<b>Equation 8:</b> Durbin-Watson Equation For Serial Correlation	68

## ABBREVIATIONS AND ACRONYMS

<b>ASEAN:</b>	Association of Southeast Asian Nations
<b>B:</b>	Billion
<b>CBK:</b>	Central Bank of Kenya
<b>CE:</b>	Capital Expenditure
<b>CET:</b>	Common External Tariffs
<b>DMD:</b>	Domestic Debt
<b>DOLS:</b>	Dynamic OLS
<b>DIS:</b>	Distance
<b>EAC:</b>	The Eastern Africa Community
<b>EPZs:</b>	Export Processing Zones
<b>EU:</b>	European Union
<b>GDP:</b>	Gross Domestic Product (USD)
<b>GEE:</b>	Generalized Equation Estimation
<b>GMP:</b>	Good Manufacturing Practice
<b>GoK:</b>	Government of Kenya
<b>GVCs:</b>	Global Value Chains
<b>H-O:</b>	Heckscher–Ohlin
<b>HTM:</b>	Hausmann Taylor Model
<b>ICT:</b>	Information Communication Technology
<b>I-O:</b>	Input- Output
<b>ICT:</b>	Information, Communication and Technology
<b>JB:</b>	Jarque-Bera
<b>KAM:</b>	Kenya Association of Manufacturers
<b>KG</b>	Kilogram
<b>KEPOBA:</b>	Kenya Export Promotion and Branding Agency
<b>KNBS:</b>	Kenya National Bureau of Statistics

<b>KXM:</b>	Capital Expenditure
<b>LH:</b>	Linder's Hypothesis
<b>M:</b>	Million
<b>MENA:</b>	Middle East and North Africa
<b>MICs:</b>	Middle-income Countries
<b>MNEs:</b>	Multinational Enterprises
<b>MTP:</b>	Medium Term Plan
<b>MVA:</b>	Manufactured Value Added
<b>NTB:</b>	Non-Tariff Barriers
<b>NACOSTI</b>	National Commission for Science, Technology and Innovation
<b>OECD:</b>	Organization for Economic Cooperation and Development
<b>OLS:</b>	Ordinary Least Squares
<b>p.a:</b>	per annum
<b>PFM Act:</b>	Public Finance Management Act
<b>PMG:</b>	Pooled Mean Group
<b>PTA:</b>	Preferential Trade Area
<b>REE:</b>	Random Effects Estimator
<b>REM:</b>	Random Effects Model
<b>R&amp;D:</b>	Research and Development
<b>REER:</b>	Real Effective Exchange Rate
<b>RTAs:</b>	Regional Trade Agreements
<b>SEZ:</b>	Special Economic Zone
<b>TBS:</b>	Tanzania Bureau of Statistics
<b>TCB:</b>	Tanzania Central Bank
<b>UBS:</b>	Uganda Bureau of Statistics
<b>UCB:</b>	Uganda Central Bank
<b>UNCTAD:</b>	United Nations Conference on Trade and Development
<b>UNIDO:</b>	United Nations Industrial Development Organization
<b>USA:</b>	United States of America
<b>USD:</b>	United States Dollar
<b>VAR:</b>	Vector Autoregressive

**VEC:** Vector Error Correction

**WB:** World Bank

## OPERATIONAL DEFINITION OF TERMS

### **Budget Deficit:**

This represents the accumulation of funds obtained domestically by the government at any point in the past, which remains outstanding and has not yet been repaid. These encompass Treasury Bills and Treasury Bonds. Government expenditure constitutes a fundamental element of the National Output, with its allocations stimulating economic activity, including exports that subsequently generate tax revenue. Increased government expenditure correlates positively with the enhancement of national economic output and the subsequent generation of tax revenue.

A deficit necessitates settlement. If it is not, it results in the accumulation of debt. The deficit incurred each year contributes to the accumulation of debt. The expansion of debt contributes to the deficit in a dual manner. Initially, it is imperative that the annual interest on the debt is addressed. This elevates expenditures without yielding any advantages. Moreover, elevated levels of debt can complicate the process of securing additional funding. Creditors express apprehension regarding the borrower's capacity to fulfill the debt obligations. In such circumstances, creditors seek to impose elevated interest rates in order to secure a more substantial return

commensurate with the increased risk involved. This exacerbates the deficit experienced each year.

**Capital Expenditure:** Capital expenditure constitutes the segment of government spending allocated towards the establishment of assets such as educational institutions, healthcare facilities, transportation infrastructure, and various public works, including roads, bridges, dams, railway lines, airports, and seaports. Capital expenditure encompasses the procurement of equipment and machinery by the government, which includes assets intended for defence applications. Capital expenditure refers to government investment that generates profits or dividends in the future. Elevated capital expenditure typically signifies increased governmental investment in the development of infrastructure and other essential assets that are vital for fostering swift economic growth and facilitating trade.

**Common Boundary:** A condition in which nations possess a shared international frontier.

**Common Colony:** A state where countries share an international boundary

**Distance (D):** This signifies the geographical distance measured in kilometres (km) among the diverse economic zones within Kenya and its trading partners, in a straight line.

**Domestic Debt:** This represents the aggregate of funds acquired domestically by the government at any point in the past that remain outstanding and have not yet been reimbursed. Their composition encompasses Treasury Bills and Treasury Bonds.

**Export Flow:** The concept of export flow refers to the process of transporting goods and services beyond the borders of a nation. The research focused on the mechanisms of trade concerning the exportation of goods from one nation to another.

**Gross Domestic Product:** The World Bank declares it as the total gross value of all resident producers in the economy.

**Government Debt:** Government debt represents the accumulation of funds acquired by the government at various points in the past, which remain outstanding and have yet to be settled. When governments engage in borrowing from the public, they issue debt; the total amount of outstanding debt reflects the aggregate sum of net borrowing undertaken by the

government. Government debt can be categorized as either domestic, originating from within the country, or foreign, arising from international sources. Modifying the total amount of debt in circulation similarly influences the interest rate, moving in the same direction. Specifically, when the government engages in competition for credit alongside the private sector, it effectively displaces the latter, which is perceived as more precarious, thereby obstructing its access to credit and investment opportunities. The reduction of investment by the private sector leads to a decline in trade and export activities.

**Manufactured Exports:** Manufactured refers to the enhanced production of goods intended for use or sale, employing labour alongside machinery, tools, chemicals, and biological processes. The designation is frequently utilized in the context of industrial manufacturing, wherein raw materials undergo a process of transformation into finished products on a substantial scale. Manufactured exports refer to the process of transporting goods and services that have undergone value addition beyond the borders of a nation.

**Moderating Variable:** A factor that modifies the connection between dependent and independent variables by either enhancing or diminishing that relationship.

**Per Capita Income:** The average income calculated for each individual, encompassing men, women, and children within a specific cohort, inclusive of those residing in communal living arrangements. The calculation is achieved by taking the total income of a specific group and dividing it by the overall population within that group.

**Regional Trading Bloc:** This term is employed in the title to denote the regional integration of trading partners.

**East African Community (EAC):** EAC is an intergovernmental regional, intergovernmental organization of six Partner States, the Republics of Burundi, Kenya, Rwanda, South Sudan, the United Republic of Tanzania and the Republic of Uganda, headquartered in Arusha, Tanzania.

The activities of the EAC are guided by the Treaty which established the Community.

The agreement was signed on 30 November 1999 and effective on 7 July 2000, having been ratified by the first three Partner States namely Kenya, Uganda and Tanzania. The Republic of Rwanda and the Republic of Burundi became full Members of the Community and were accepted as such on 1 July 2007 following their joining the EAC Treaty on 18 June 2007. Republic of South Sudan became a

signatory to the Treaty on 15 April 2016 and became a full member on 15 August 2016.

**Population:**

This constitutes a collective of individuals cohabiting and engaging in reproduction within a specified geographical region, specifically a nation in the context of this analysis.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

In today's rapidly transforming global economy, manufactured exports have emerged as pivotal drivers of sustainable economic development, structural transformation and technological upgrading, especially for developing countries seeking to diversify their export base and integrate into the global value chain (World Trade Organisation [WTO], 2018). The shift from traditional, primary commodity exports toward medium- and high-technology manufactured goods is no longer just a policy option but an economic imperative. Economies that continue to rely heavily on primary exports face persistent vulnerabilities to external price shocks, limited value addition, and slow industrial development.

In a globally competitive scenario, countries relying significantly on exports of primary goods face long-term constraints. A global shift from natural resource-based and low technology-intensity exports to medium and high technology-intensity exports is well established. Rijesh (2017) examined India's transition towards technology-intensive exports post-1990, using UNCTAD database regression models. The study found a steady but sluggish shift from primary exports to medium-low tech manufacturing. Factors slowing this transition included underinvestment in R&D, a skills gap, limited FDI, and weak global competitiveness Baranovs, Salmins & Skribane (2021). The study recommended that India's policymakers promote high-tech export sectors through incentives and structural reforms.

In response to these issues, India Brand Equity Foundation (IBEF) commissioned a study titled *Enhancing India's Global Manufacturing Competitiveness* (IBEF, 2019). It

emphasized the importance of manufacturing exports, noting they contributed 15.4% of real GDP in 2012 and employed 12% of India's population (Jha, 2018). Between 2010 and 2015, manufacturing grew at 8.5%, slightly higher than the GDP's 8.4% average growth. In FY 2011, engineering goods made up 40.4% of manufactured exports, followed by gems and jewellery (24.3%), chemicals (17.2%), and textiles (13.9%). However, India's global share of manufactured exports remained small at 1.4% far behind China's 14.8%. (Ye *et al.*, 2017). The study cited infrastructure deficits, limited R&D, low FDI, and rising input costs as major barriers, recommending diversified export markets, flexible labour laws, and enhanced tech capabilities (IBEF, 2018).

The Australian Productivity Commission (2020) revisited long-term trends in Australia's manufacturing. In the 1960s, manufacturing comprised one-quarter of GDP, but fell to one-eighth by 2000, mirroring consumer shifts toward service sectors. Despite productivity growth, manufacturing employment shrank significantly. However, growth remained strong in high-skill, resource-based manufacturing, driven by capital investments in advanced technologies. Export engagement increased from 15% to 24% of manufactured output between 1989 and 2000. The rise in intra-industry trade signalled potential for Australian manufacturing to build sectoral competencies across traditionally uncompetitive areas (Australian Productivity Commission, 2020).

The United Nations Industrial Development Organisation [UNIDO], (2017) reported that African manufacturing firms are increasingly integrated into global value chains (GVCs), leading to gains in exports, productivity, and employment. GVC expansion, driven by ICT and lower transport costs, allowed African firms, especially in Ethiopia and South Africa, to assume low-cost, labour-intensive production roles. Manufactured

exports in Africa rose from 35.5% of total exports in 2008 to 54.2% in 2016 (Kabeta, 2017). However, Africa lags globally, with only 53% of its merchandise exports in manufactured goods in 2017, compared to Europe's 91% and Asia's 89.8% (UNIDO, 2017). Moreover, 64.8% of Africa's manufactured exports were intermediate goods, implying limited domestic value addition.

According to Parshotam (2018) and UNCTAD (2018), integration into GVCs is constrained by trade policy barriers, weak infrastructure, and customs inefficiencies. More than 75% of African exporters rely on imported inputs, suggesting reforms like lower tariffs, relaxed rules of origin, and upgraded port infrastructure are crucial. Firm-level data highlights the need for differentiated industrial policy and targeted SME support to enhance competitiveness (Parshotam, 2018).

In South Africa, the IMF explored sluggish manufactured export growth despite a significant currency depreciation post-2011. Although the Rand depreciated by 25% between 2011–2014, exports only grew by 4%. Factors like weak infrastructure, industrial action, and energy shortages hindered performance (Gengele, 2019). Structural constraints such as high wage costs, limited competition, and labour market rigidities suppressed responsiveness to price shifts.

Owusu (2019) showed that SMEs, especially those exporting to Sub-Saharan Africa, were more adaptive to exchange rate movements, reinforcing the need for structural reforms in infrastructure and market flexibility.

By 2018, Uganda's total merchandise exports reached around USD 3.09 billion, while imports stood at approximately USD 6.73 billion, reflecting a net trade deficit of about 6.5% of GDP. Industry accounted for about 15.4% of GDP in 2018, with manufactured

exports making up roughly 22.5% of total merchandise exports, while manufactured imports comprised 63%. Manufacturing was responsible for 6.6% of formal employment in 2019 and contributed about 15.8% to GDP by 2020.

The manufacturing production index increased steadily from a base of 100 in 2010 to over 285 by 2020, with sub-sectors like chemicals and textiles seeing annual gains of 14–24%. Uganda's formal industrial exports, including processed food, textiles, and chemicals, reached USD 632 million in FY 2018/19, with the EAC accounting for 27% of total export destinations, followed by the Middle East.

Uganda's trade dynamics within the EAC shifted notably in FY 2018/19: exports to EAC partners fell by 21% to USD 1.195 billion, while imports from the region rose by 43% to USD 1.161 billion, leaving Uganda with a thin surplus of just USD 39 million. Specifically, Uganda itemizes a trade surplus with Rwanda and South Sudan but experienced deficits USD 322 million with Tanzania, and a USD 191 million deficit with Kenya.

Tanzania's total merchandise exports reached approximately USD 7.3 billion in 2022, with gold and minerals alone making up nearly 43% of the export portfolio. In 2023, Tanzania exported USD 1.35 billion worth of goods to Uganda, representing a significant 4.27% of Tanzania's total exports. Key exports to Uganda included gold (about USD 1.05 billion), rice (about USD 119 million), and groundnuts (about USD 25.6 million). Capital goods, machinery, and electrical equipment accounted for approximately 12% and 11% of Tanzania's total imports in 2023, underscoring investment in industrial capacity. Although Tanzania maintains a trade surplus with Uganda overall, the bilateral profile reveals deeper layers of industrial interdependence.

In Kenya, the Kimenyi and Were (2018) reported that the manufacturing sector had grown at 4% and employed 280,000 people by 2018. Substantial growth was noted in dairy, chemicals, fabricated metals, textiles, pharmaceuticals, and automotive sectors. Kenya's proximity to EAC markets, investment in SEZs and EPZs, and relatively skilled workforce contributed to this growth (Newman & Page, 2017). As of 2018, 20% of Kenya's manufacturing employment was based in EPZs, especially in food processing and textiles. Strategic plans under Vision 2030, including three new SEZs in Mombasa, Lamu, and Kisumu, are aimed at expanding industrial capacity and competitiveness (Republic of Kenya, 2021).

Kenya's global standing has also improved. According to the World Economic Forum (Gross, 2019) Kenya ranks 4th in Africa in manufacturing competitiveness, behind Seychelles, Ghana, and Zambia. Its manufacturing value added (MVA) per capita surpasses Tanzania by 50%, and is over double that of Uganda. From 1990 to 2014, Kenya's working-age population rose from 47% to 56%, projected to reach 40 million by 2030 (Cilliers *et al.*, 2018). This demographic trend supports Kenya's long-term potential as a manufacturing and export hub.

Between 2007 and 2015, Kenya exported USD 1.85 billion in manufactured goods to the EAC, accounting for 37.4% of regional exports. Despite a decline in total EAC exports from USD 14.7 billion in 2017 to USD 14.0 billion in 2018, intra-EAC exports increased by 5.6%, highlighting the bloc's growing integration (East African Community, 2019). Kenya's exports to Uganda and Tanzania, its largest trading partners, amounted to USD 914 million out of USD 1.3 billion in 2018. These two countries represented 70% of their regional manufactured trade.

Yet, Kenya's performance remains constrained by under-diversification and limited value addition in industrial exports (East African Community, 2019). Vision 2030's Third MTP aims for manufacturing to contribute at least 10% of GDP and to double the share of manufactured goods in regional trade from 7% to 15% by 2022 (Republic of Kenya, 2018). Despite broad literature linking general exports to GDP and exchange rates, there is a lack of empirical research on how capital expenditure, domestic debt, and population size influence Kenya's manufactured exports. This study fills that gap by examining Kenya's manufactured exports to Uganda and Tanzania from 2007–2018, the period marking the EAC treaty and Kenya's MTP III under Vision 2030.

## **1.2 Statement of the Problem**

Kenya's manufacturing sector, underpinned by its pivotal role in Vision 2030, was projected to be a key driver of economic transformation. As outlined in the Third Medium-Term Plan, manufacturing was expected to contribute a minimum of 10% to the country's GDP annually by leveraging its immense potential for job creation, stimulating rural agricultural growth, and boosting the volume of manufactured exports within the East African Community (EAC) (Republic of Kenya, 2018). A targeted strategy was put in place to increase the share of manufactured goods in the regional market from 7% to 15% by 2022, reflecting a clear commitment to industrial development and regional integration (Republic of Kenya, 2018).

Despite these aspirations, the reality indicates a considerable underperformance. Kenya's exports to its regional counterparts have stagnated. For instance, in 2018, while intra-EAC exports grew by 5.6%, Kenya's manufactured exports to the region increased by a mere 0.1%, rising to USD 1.3 billion, with Uganda and Tanzania alone accounting for USD 914 million, or 70% of the total (EAC Trade and Investment Report, 2018).

This tepid growth is particularly concerning in the face of declining overall EAC exports, which fell by 4.7% in 2018 from USD 14.7 billion in 2017 to USD 14.0 billion, largely attributed to insufficient value addition, limited industrial modernization, and weak diversification of manufactured goods (East African Community, 2019).

This mismatch between policy intentions and trade outcomes highlights systemic bottlenecks undermining Kenya's manufacturing export capacity. Structural and macroeconomic factors such as capital expenditure limitations, rising public debt burdens, population pressures, and income disparities in regional partner states may be constraining Kenya's competitiveness in the regional industrial trade landscape. Moreover, Kenya's manufactured exports remain narrowly concentrated, both in terms of product variety and destination markets, with limited access into non-traditional regional sectors.

While general literature on Kenya's export performance exists, it is largely descriptive or focused on global trade patterns. There is a significant knowledge gap regarding how specific macroeconomic aggregates, namely capital expenditure, domestic debt, population size, and the standard of living in trading partner countries, affect Kenya's manufactured exports to Uganda and Tanzania. This gap limits the ability of policymakers to design targeted interventions that can enhance Kenya's industrial trade performance in the region.

Moreover, there is a temporal gap in the available research. Few studies examine export dynamics over the full period of the Second Medium Term Plan of Vision 2030 implementation (2007 to 2018), which is necessary to assess the long-term impact of the country's industrialization strategy and trade policy reforms. As a result, the effectiveness of Vision 2030 in boosting manufacturing exports remains empirically

under-explored. Additionally, most existing studies overlook the bilateral trade relationship between Kenya and its principal EAC partners, Uganda and Tanzania, focusing instead on aggregate regional or global flows. This represents a contextual gap, as Uganda and Tanzania collectively account for the bulk of Kenya's regional trade in manufactured goods. Without detailed country-specific insights, Kenya's export strategy remains misaligned with actual trade flows and market dynamics. By focusing on this critical period and key bilateral relationships, the study seeks to generate evidence-based recommendations to inform trade policy and support industrial growth aligned with the goals of Vision 2030.

### **1.3 Objectives of the study**

#### **1.3.1 General Objective**

To determine the effect of macroeconomic variables on Kenya's manufactured exports to Uganda and Tanzania.

#### **1.3.2 Specific Objectives**

- i. To determine the effect of capital expenditure on Kenya's manufactured exports to Uganda and Tanzania.
- ii. To analyse the effect of domestic debt on Kenya's manufactured exports to Uganda and Tanzania.
- iii. To establish the effect of population size on Kenya's manufactured exports to Uganda and Tanzania.
- iv. To examine the moderating effect of the standard of living on Kenya's manufactured exports to Uganda and Tanzania.

### **1.4 Research Hypothesis**

- i. **H<sub>01</sub>**: Capital expenditure does not have a significant effect on Kenya's manufactured exports to Uganda and Tanzania.

- ii. **H<sub>02</sub>:** Domestic debt does not have a significant effect on Kenya's manufactured exports to Uganda and Tanzania.
- iii. **H<sub>03</sub>:** Population size does not have a significant effect on Kenya's manufactured exports to Uganda and Tanzania.
- iv. **H<sub>04</sub>:** Standard of living does not have a moderating effect on the relationship between macroeconomic variables on Kenya's manufactured exports to Uganda and Tanzania.

### **1.5 Significance of the Study**

This research holds significant relevance for both academics and policymakers interested in understanding the complex dynamics of regional trade, particularly in the area of manufactured goods. For scholars, the study provides empirical insights into the macroeconomic determinants of Kenya's manufactured exports, contributing to the existing body of literature on trade performance, regional integration, and industrial development in Sub-Saharan Africa. By examining trade flows between Kenya, Uganda, and Tanzania over a defined period, the research offers valuable data for future comparative studies and policy evaluation.

For policymakers and trade stakeholders, the study serves as a practical tool for identifying the key factors that either facilitate or hinder Kenya's regional trade performance. Such understanding is vital in designing and implementing targeted interventions aimed at strengthening the country's industrial export capacity. The comprehensive analysis of trade and development statistics between Kenya and its neighbouring countries presents a clear picture of opportunities for expanding the export base, improving market access, and enhancing Kenya's competitiveness in the East African region. Ultimately, the study offers actionable recommendations that can

inform evidence-based policies to support sustainable industrial growth and regional economic integration.

## **1.6 Scope of the Study**

This study focused on the effect of macroeconomic aggregates on Kenya's manufactured exports to Uganda and Tanzania. The choice of these two countries was deliberate and strategic. Uganda and Tanzania are not only Kenya's immediate neighbours but also founding members of the EAC, having ratified the EAC Treaty in 2007. Since then, the two countries have emerged as Kenya's most significant regional trading partners, consistently accounting for approximately 70 per cent of Kenya's manufactured exports within the EAC. Their importance in Kenya's regional trade architecture made them ideal for an in-depth bilateral analysis.

The study covered the period between 2007 and 2018. This timeframe was selected for its policy relevance and data availability. The year 2007 marked the enforcement of the EAC Treaty and the operationalization of the EAC Customs Union, which established a common trade framework among member states. This created a consistent and legally binding environment for trade, particularly in manufactured goods, and made it possible to examine Kenya's export performance under a unified regional policy regime. The end point of the study, 2018, was equally significant. It marked the beginning of Kenya's Third Medium-Term Plan (MTP III) under Vision 2030, in which manufacturing was identified as one of the key pillars under the Big Four Agenda. This policy shift underscored the government's commitment to reviving industrial growth and expanding export markets, particularly within the region.

While the study acknowledged that numerous economic variables could influence manufactured exports, it narrowed its focus to three key macroeconomic aggregates:

capital expenditure (KXM), domestic debt (DMD), and population size (POP). These variables were selected due to their theoretical and practical relevance in explaining trade performance. Capital expenditure represents the level of public investment in infrastructure and industrial support systems, which can enhance the productivity and competitiveness of the manufacturing sector. Domestic debt, on the other hand, reflects the government's borrowing obligations, which may affect its ability to fund development projects, thereby influencing export capacity. Population size serves as a proxy for labour availability, production scale, and domestic consumption patterns that may support or constrain export surplus. In addition, the study considered the standard of living in the trading partner countries (DGC) as a moderating variable, recognising that income levels and consumption capacity in Uganda and Tanzania could significantly influence the demand for Kenyan manufactured products.

### **1.7 Limitations of the Study**

During the study, several limitations were encountered, particularly in the process of data collection. First, the availability of consistent and complete data before 2008 was a challenge, especially for variables such as domestic debt and capital expenditure disaggregated by sector. To address this, the study limited its scope to the 2007–2018 period, where reliable and comparable data were accessible across all selected variables.

Second, while Kenya trades with multiple EAC countries, only Uganda and Tanzania were included due to the unavailability of detailed and consistent trade data for other member states, such as Rwanda and Burundi. This bilateral focus ensured quality analysis but may limit broader generalisation to the entire EAC region.

Third, the study used secondary, aggregated national data, which did not account for firm-level or sector-specific dynamics within the manufacturing sector. While this limited deeper micro-level insights, the analysis still provides a solid macroeconomic perspective relevant to national policy discussions. Despite these limitations, the study maintained methodological rigour by cross-verifying data from multiple credible sources such as the World Bank, Kenya National Bureau of Statistics (KNBS), and EAC trade reports to ensure reliability and accuracy.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Overview of the Chapter**

This section reviews trade theories, empirical studies that have delved into the field of international trade, a summary of the literature and the conceptual framework guiding the study.

#### **2.2 Theoretical Literature**

This study was guided by three key trade theories: the Ricardian Theory of Comparative Advantage, the Heckscher-Ohlin (H-O) Theory, and the Linder Hypothesis (1961). These theories were chosen because they collectively explain the causes, patterns, and effects of international trade, particularly in manufactured goods. The Ricardian Theory supports the idea that Kenya can export manufactured goods to Uganda and Tanzania based on relative efficiency, even if it is not the most productive overall. The H-O Theory was relevant for its focus on factor endowments, aligning with the study's analysis of capital expenditure and population size. The Linder Hypothesis was included for its emphasis on economies of scale, product differentiation, and intra-industry trade, which are key in understanding Kenya's trade in manufactured products within the EAC. Together, these theories provided a strong conceptual foundation for examining how macroeconomic factors influence Kenya's manufactured exports.

##### **2.2.1 Comparative Advantage Theory of Trade**

The theory of comparative advantage, articulated by the British economist David Ricardo in 1817, serves as the fundamental basis for advocating free trade. The principle of comparative advantage posits that it is beneficial for a nation to import certain goods, thereby liberating its labour force to engage in the production of more

valuable commodities. A nation ought to prioritise more meaningful endeavours rather than engage in the production of inferior goods.

This reasoning extends to land, capital, technology, and all other limited resources utilised in the production of goods. The theory of comparative advantage posits that if a nation can generate a more valuable output with the resources it currently allocates to the production of a particular good, it ought to import that good, thereby liberating those resources to focus on the creation of the more valuable product. The term used to describe what an economy sacrifices in its production of one good or service to produce another is known as “opportunity cost.” The converse of opportunity cost is direct cost.

The concept of direct cost fundamentally revolves around efficiency, remaining constant irrespective of external circumstances or global events. The concept of opportunity cost is inherently complex, as it is contingent upon the array of alternative opportunities available for the utilisation of production factors. Assuming all other factors remain constant, there exists a direct correlation between direct cost and opportunity cost, such that they fluctuate in tandem. Consequently, elevated efficiency often leads to both minimal direct costs and reduced opportunity costs. If an individual possesses the remarkable ability to mow an entire lawn in just 15 minutes, the opportunity cost associated with this task will be minimal, as there are limited alternative activities available within that brief timeframe.

The opportunity cost associated with the production of a particular item is invariably the value of the next most advantageous alternative that could have been realised instead. It stands to reason that a reduced opportunity cost correlates with a diminished waste of potential, thereby indicating a more effective utilisation of available

opportunities. Consequently, the most prudent course of action is to consistently reduce our opportunity cost.

This is the point at which trade becomes relevant. Trade facilitates the acquisition of bread from stores, allowing us to forgo the labour of baking our own and instead focus on crafting rolls. Trade allows a nation to procure all the items it would otherwise need to produce independently. In a scenario where trade is entirely unrestricted, countries can methodically relinquish their least productive endeavours and redirect their efforts towards their most advantageous pursuits. Comparably, countries can methodically reduce their least advantageous sectors while simultaneously fostering the growth of their most beneficial industries. This practice serves the interests of these nations and enhances global free trade; when every nation engages in it, the entire world stands to gain. The global economy, along with each nation within it, strives to achieve the highest levels of productivity attainable. This suggests that in a free trade environment, the production of each product will inevitably shift to the country that can manufacture it with the least opportunity cost, the country that minimizes the loss of alternative opportunities by engaging in that particular industry (Ian Fletcher, 2011).

The theory of comparative advantage perceives international trade as a complex, interconnected framework of trade-offs, wherein nations leverage their capacity to import and export in order to minimise opportunity costs and reallocate their factors of production to their most efficient applications. This process occurs seamlessly, as owners of any factor of production will naturally seek out more valuable applications, finding it advantageous to reallocate their resources accordingly. The Ricardo model illustrates that variations in technology across economies provide certain nations with a comparative advantage in the production of specific goods, thereby fostering

advantageous international trade (Suranovic, 1997). The inherent motivation for profit will guide all elements of production towards their most valuable applications, ensuring that opportunities are never squandered. When imports compel a nation to exit an industry, it signifies a positive development for that nation, as it indicates a reallocation of its factors of production towards the creation of something of greater value. Had it not been for this, the rationale of profit would not have compelled its elements to abandon their previous applications. According to the theoretical framework, the nation's "revealed comparative advantage" is posited to exist in a different domain, suggesting that it will achieve greater prosperity by aligning its production with this newly identified comparative advantage.

It is important to recognise that the opportunity cost associated with the production of a product may differ between nations, even when the direct costs of production are identical in both cases. This arises from the potential for various alternative applications of the factors of production in question. The phenomenon of low opportunity cost in the production of a product can equally stem from a lack of viable alternative applications for the factors of production, as well as from a high level of efficiency in the production process itself.

This is where less developed nations become relevant: their opportunity costs are minimal due to the limited alternatives available for their workforce. The observable manifestation of this phenomenon is low-wage labour, as their economies provide workers with limited options beyond dollar-an-hour factory employment (Ian Fletcher, 2011).

The theory of comparative advantage is occasionally misconstrued to suggest that a nation's optimal strategy is to attain as much comparative advantage as possible—

preferably, comparative advantage across all industries. This is inherently unfeasible according to its very definition. Even if America exhibited unparalleled productivity, resulting in reduced direct costs and an absolute advantage across all industries, there would still exist varying degrees of superiority in certain sectors compared to others. On the other hand, the theory of comparative advantage posits that when nations exhibit varying relative productivities, there will inevitably be mutual benefits arising from trade. This is the rationale behind the conviction among proponents of free trade that the theory demonstrates its universal benefits for all nations, irrespective of their economic status, whether affluent or impoverished. Affluent nations will not be drained by the inexpensive labour of less affluent countries, nor will developing nations be overwhelmed by the advanced industrial capabilities of wealthier states. This theory is constrained to a singular factor economy, whereas the broader economic theory encompasses land, labour, enterprise, capital, and technology as essential factors of production. Ultimately, this theory is constrained in its reliance on supply factors to elucidate international trade.

### **2.2.2 Heckscher–Ohlin (H-O) Theory**

The theory of Heckscher-Ohlin (H -O) was originally mentioned by Eli Heckscher a Swedish economist in 1919 and later developed by his student Bertil Ohlin in 1933. The theory was formulated to build on the theory of comparative advantage formulated by Ricardo which only concentrated on labour being the foundation of trade. Heckscher and Ohlin suggested capital as a further factor of production suggesting that international trade patterns are largely dictated by the dissimilarities in country relative endowments of factors namely, labour and capital.

The H-O principle is based on the following premise; the exporting countries will export products that intensive utilize their factors of production that are abundant and inexpensive, and import products that intensive utilize their factors that are scarce and expensive. As an example, capital-abundant nations are supposed to export capital-intensive goods, whereas labour-abundant nations would export labour-intensive goods. This association means that comparative advantage is based on disparities in resource endowments and not merely on productivity disparity.

The theory has been supported by scholars such as Peng (2017), who observed that industrialized nations like the United States tend to export capital-intensive goods, while labour-abundant nations, such as Ghana, focus on exporting labour-intensive goods. Additionally, Leamer (1995) reinforced the model's significance by noting that trade effectively extends the local market for factor services to a global scale, making input demand more realistic and more uniform across countries.

Despite its strengths, the H-O theory has been criticized for not adequately explaining the large volume of intra-industry trade between similarly endowed countries, especially among industrialized nations. Furthermore, it primarily emphasizes supply-side factors, without fully incorporating demand-side elements or technological advancements, which also influence modern trade flows.

Nonetheless, this theory remains relevant to the current study. Since the research investigates the influence of capital expenditure, domestic debt, and population size on Kenya's manufactured exports to Uganda and Tanzania, the H-O model provides a useful framework. It explains how differences in factor availability, capital and labour between Kenya and its regional trading partners may shape trade patterns. For example, Kenya's relatively higher capital investment compared to its neighbours can enhance

the production of manufactured goods for export, aligning with the theory's premise that countries export what they can produce more efficiently due to their factor endowments. This makes the H-O theory a foundational basis for understanding the structural determinants of Kenya's regional export performance in manufactured products.

### **2.2.3 Linder Hypothesis (1961)**

This research is grounded in this theoretical framework. In 1961, economist Staffan Burenstam Linder proposed a hypothesis suggesting that a greater similarity in preference structures between two countries correlates with an increase in trade volume. To put it differently, nations that exhibit comparable income per capita are likely to share analogous preferences, resulting in the production of similar yet distinct products, thereby fostering increased trade among themselves (Linder, 1961).

Historically, numerous trade theories have focused on the supply aspect to elucidate the direction of trade. The Heckscher-Ohlin trade theory posits that nations with an abundance of capital tend to export goods that require significant capital investment, whereas nations with a surplus of labour are inclined to export labour-intensive goods. This suggests that commerce often takes place between a wealthy nation and a less affluent one.

Nonetheless, U.S. economist Wassily W. Leontief noted a paradox within the frameworks of supply-side trade theories. Leontief endeavoured to elucidate the structure of relative factor proportions concerning U.S. engagement in international trade. The Heckscher-Ohlin trade theory posits that a nation is likely to export commodities that make intensive use of its abundant factors of production, while

importing those that rely heavily on its scarce factors. It is widely acknowledged that the United States possesses a remarkable abundance of capital. Consequently, it is reasonable to anticipate that the United States will export goods that require significant capital investment while importing those that rely more heavily on labour.

Leontief's initial investigation was grounded in calculations derived from input-output tables created for the year 1947. The findings indicated that the specified value of U.S. exports contained a lower capital intensity and a higher labour input than what would be necessary to enhance domestic production to yield a comparable volume of competitive imports. Stated in another way, industries focused on replacing imports in the U.S. demanded a greater amount of capital in comparison to labour than those industries engaged in exports.

Linder (1961), nonetheless, emphasised the significance of the demand and preference aspects in elucidating trade patterns, positing that trade occurs between nations possessing analogous demand structures. He posited that trade patterns in manufactured goods are contingent upon the congruence of preferences among nations. He posited that nations exhibit analogous demands for manufacturing in relation to others possessing comparable per capita income levels, and obtained favourable empirical outcomes. Since the proposal of this thesis, numerous empirical studies have emerged in relation to it. In his study "Linder Hypothesis Revisited," Choi (2002) provided support for the Linder hypothesis. His research employed a more contemporary and expansive data set compared to earlier investigations.

Moreover, in examining the hypothesis, he utilised a modified gravity-type trade model alongside a fixed effects panel data model. Employing bilateral trade data encompassing 63 nations (or 1953 country pairs) throughout the timeframe of 1970 to

1992, specifically during the years 1970, 1980, 1990, and 1992. By analysing the disparity in per capita income, measured in USD, among the trading nations, he discovered that all coefficients aligned with theoretical expectations, suggesting that the Linder hypothesis is more robustly corroborated by contemporary data. This could, in part, elucidate the unsatisfactory empirical outcomes observed in the early 1980s. Research indicates that nations exhibiting a narrower disparity in per capita GNP are inclined to engage in higher levels of trade. It was observed that nations with greater wealth engage in trade more frequently.

Nonetheless, this theory encounters various constraints in elucidating bilateral trade relations. For instance, it fails to account for the influence of culture, as well as the receptiveness to international trade and political dynamics. The role of culture in influencing trade dynamics: Over the past few decades, influenced by the insights of economists like Krugman (1980) and Evans-Mavondo (2002), the theory of international trade has increasingly highlighted the role of costs as a crucial element in trade dynamics. Costs associated with international trade can be categorized into two main types: those arising from geographical distance, such as transport costs, and those stemming from cultural diversity. The expenses stemming from the cultural divide between nations present intricate challenges that appear increasingly difficult to surmount. Johanson and Wiedersheim-Paul (2017) emphasised the significance of cultural distance in international trade, noting that among the myriad challenges companies encounter when entering foreign markets, one transcends typical bureaucratic and legislative hurdles, as well as geographical separations: the concept of "psychic distance". This delineates the array of informative obstacles associated with cultural diversity among individuals, which inversely correlates with the geographical distance between the nations engaged in trade.

The extent of receptiveness to global commerce as a factor influencing trade dynamics: The prevalence of tariff and non-tariff barriers in a nation serves as a metric for assessing that nation's openness to global trade. Tariff barriers typically pertain to duties imposed on goods. These signify a levy that burdens the worth of goods brought into a specific nation. The immediate outcome is a detriment to the marketplace for foreign products and the enterprises that manufacture these goods, leading to a subsequent adverse distortion in international trade. Nonetheless, duties represent merely one type of tariff barrier that can impede the standard progression of the internationalization of goods.

Furthermore, there are administrative hurdles such as state ownership and the creation of technical standards, as well as quota limitations and commodity agreements, the latter of which seek to stabilise the pricing of specific products over the long run. An empirical study of trade flows considers a number of political variables as determinants. These variables include political animosity between prospective trading partners, the exporting country's political instability, and the presence of colonial relations between the exporting and importing countries. It is generally acknowledged that significant political instability in the exporting nation correlates with a diminished volume of trade.

Concerning the second political variable, namely the trade relations between the colony and the mother country, the colonial legacy is often viewed as a critical and significant factor in analysing the intensity of trade. Despite having achieved political independence from their former colonial powers, ex-colonial nations continue to exhibit a notable degree of commercial interdependence, largely attributable to enduring political and cultural connections that significantly impact international trade. This theory proves to be instrumental in this study as it posits that the trade intensity of

a nation is influenced by the income levels of its trading counterparts. Consequently, a developing nation such as Kenya, characterised by a substantial primary sector and an expanding industrial base, is likely to engage in increased exports to EAC partners that possess a comparable demand structure, particularly in terms of income levels. The East African Community (2018) indicates that Kenya's substantial agricultural exports reveal significant manufacturing potential, should they be utilised as industrial raw materials. In 2018, Kenya primarily exported manufactured goods to Uganda and imported predominantly agricultural products from there, while its trade with Tanzania consisted mainly of manufactured goods on both sides.

The worth of Kenya's exports and imports to Uganda stood at USD 618 million, a decrease from USD 626 million in 2017, primarily comprising manufactured goods. Conversely, imports amounted to USD 513 million, an increase from USD 500.5 million in 2017, predominantly consisting of agricultural products. The worth of Kenya's exports and imports to Tanzania was relatively modest at USD 296 million, an increase from USD 289 million in 2017, primarily consisting of manufactured goods. The figures remained stable at USD 177.7 million for both 2018 and 2017, also predominantly comprising manufactured products, as reported in The East African Community (2018). In 2018, Kenya's regional export growth rate was recorded at a modest 0.1 per cent.

This research examined the parallels in demand structure, particularly concerning income levels, between Kenya and Uganda, as well as between Kenya and Tanzania, and observed the implications for Kenya's manufactured exports to both nations. The research examined the demand frameworks of Uganda and Tanzania to determine whether they influenced Kenya's manufactured exports to these countries, as well as the significance of any observed effects. Informed by Linder's theory, Kenya can

strategically enhance its manufactured exports within the region, aligning with the objectives of Vision 2030's MTP III.

### **2.3 Conceptual Review of Study Variables**

This section reviews variables in this study and their units of measurement as they appear in the conceptual framework.

#### **2.3.1 Capital Expenditure**

Capital expenditure constitutes the segment of government spending allocated towards the establishment of essential assets such as educational institutions, healthcare facilities, transportation infrastructure, and various public works, including roads, bridges, dams, railway lines, airports, and seaports. Capital expenditure encompasses the procurement of equipment and machinery by the government, which includes items intended for defence applications. Capital expenditure refers to government investments that generate future profits or dividends.

Aluthge, Jibir, and Abdu (2021) examined the impact of Nigerian government expenditure on economic growth. The study, employing a perpetual inventory method to assess capital expenditure as a stock variable, concluded that capital investment promotes economic growth.

Onifade, Ergogan, Asongu, and Bekun (2020) conducted an analysis utilising Nigerian data to explore the relationship between government spending and economic growth, specifically quantifying capital expenditure as a percentage of GDP. This study quantified capital expenditure as the aggregate government spending directed towards development initiatives.

#### **2.3.2. Domestic Debt**

This is a sum of money that was obtained at home by the government at any time in the past that are outstanding and yet unreimbursed. They include Treasury Bills and

Treasury Bonds. In their study of the impact of domestic debt on the Kenya economy, Maana et al. (2008) used annual data in their study. In their study on the effects of domestic debt on the Nigeria economy, Adofu and Abula (2010) looked at the correlation between stock of domestic debt and national output. Babu et al. (2015) empirically studied the effect of domestic debt, which is a percentage of Gross Domestic Product (GDP) on economic growth in the East Africa Community (EAC) in the period 1990 to 2010. The study made use of the detailed annual list of domestic liabilities.

### **2.3.3. Population**

This constitutes a collective of individuals cohabiting and engaging in reproduction within a specified geographical region, specifically a nation, in the context of this analysis. Nuroglu (2010) employed population size as a variable to examine its influence on bilateral trade flows. Karimi *et al.* (2018) examined the impact of population ageing on the trade of industrial products with Iran's principal trade partners, utilising age groups as a framework during the period from 2000 to 2015. This research assessed the total population size of Kenya.

### **2.3.4 Standard of Living**

This represents the extent of affluence, ease, tangible assets, and essential resources accessible to a specific socioeconomic group or geographical region. It also signifies a state of well-being. Early researchers evaluated the standard of living exclusively through material metrics, specifically employing real GDP per capita. Nonetheless, the United Nations Development Programme (1999) integrated social and economic indicators. The Human Development Index integrates GDP per capita, life expectancy at birth, and a composite assessment of education derived from literacy rates and school

enrolment figures into a singular index value. This research utilised real GDP per capita as a proxy for the standard of living.

### **2.3.5 Manufactured exports**

The total of low-tech, medium-tech, and high-tech products exported by a country. Matthee and Naudé (2008) utilised the magisterial, similar to sub-county, exports (in actual value) to examine the determinants of manufactured exports from South Africa. Sekkat and Varoudakis (2000) utilised the Average Share of Manufactured Exports in Total Exports to examine the impact of exchange rate management on manufacturing performance in sub-Saharan Africa. This study selected the aggregate value of manufactured exports.

## **2.4. Empirical Literature Review**

### **2.4.1 Capital Expenditure and Manufactured Exports**

Chikelu and Okoro (2016) established the research question of whether or not the slow pace of growth in the manufacturing sector in Nigeria was due to insufficient distribution of capital expenditure, and the presence of a causal relationship between Capital expenditure and growth in the manufacturing sector. Johansen Co-integration analysis was employed in this study on the variables in the model, namely: Manufactured output in Nigeria, Capital expenditure, Foreign direct investment, interest rate and exchange rate. The Granger causality test was applied to determine whether there was causal relationship between capital expenditure and growth of the manufacturing sector. The study suggested that the capital investment plays a great role in determining the growth of the manufacturing sector. It also established that capital expenditure is the force behind growth of the manufacturing industry in Nigeria. The study showed that there is a positive relationship between capital investment and

manufactured production in Nigeria. The purpose of the paper is to analyse the effect of capital expenditure on the manufactured exports of Kenya to the EAC and whether it is similar to the results in Nigeria. Since the East African environment lacks relevant studies, the need to establish the same is imperative.

externalisability of the findings.

Udoka and Anyingang (2015) examined the influence of government spending on the Nigerian economy growth and development (1980-2012). The study had three research hypotheses. The hypotheses examined how the aggregate expenditure, capital expenditure and recurrent expenditure affects economic growth and envelopment in Nigeria. The research design used was ex-post facto research design, and annual publications of Central Bank of Nigeria provided data. The collected data was analysed through the application of the Ordinary Least Squares multiple regression statistical method. The outcome showed that there was also a considerable impact of capital expenditure on the growth and development of the Nigerian economy. The research advised that the government needs to increase its expenditure on elements of capital expenditure and this will consequently stimulate investment in the country.

Nwanne (2015) tested the effects of the government capital spending on the production of the manufacturing industry in Nigeria. The study was based on the use of time series data in quantitative form and analysis using multiple regression. Results of the co-integration test showed that the dependent and independent variables were long-term correlated. It was also revealed that capital expenditure on road infrastructure (CEXR) and telecommunications (CEXT) significantly affects the output of the manufacturing sector in Nigeria with the government capital expenditure on power having a little impact on the manufacturing sector in Nigeria. This reveals that the production of the

manufacturing sector is sensitive to the external as well as endogenous factors concerning the government capital expenditure in Nigeria. The study shows that there is an encouraging relationship between capital expenditure and manufacturing industry. However, the effect on the manufactured exports of Kenya to the EAC still needs to be determined and therefore this study is necessary.

Emmanuel and Oladiran (2015) investigated the relationship between the output of the manufacturing sector in Nigeria and the government expenditure. In the analysis of government expenditure, it was disaggregated into capital and recurrent items with special emphasis on the effect of capital component. The study employed time series data dating back to the year 1970 to 2013. The data concerning the output of the manufacturing sector, capital expenditure and recurrent expenditure, the nominal and real Gross Domestic Product (GDP), exchange and interest rates were obtained in the Statistical Bulletin and the Annual Report and Statement of Accounts published by the Central Bank of Nigeria (CBN). After corrections of the errors, the estimates showed that government capital expenditure positively correlates with the output of the manufactured sector in Nigeria, and recurrent expenditure has a negative influence on the output of the manufactured sector. The results showed the percentage change in output in the manufactured sector was 11.2 per cent with one per cent increase in government capital expenditure as compared to -26.9 per cent with recurrent expenditure. This study states that there is a positive relationship between capital expenditure and output in the manufacturing industry, hence there is a need to scrutinize its effects on the manufactured exports to the EAC in order to find out whether similar findings can be realised.

Nwokorobia and Okonkwo (2019) evaluated the role of government capital spending on the Industrial Production Output in Nigeria, 1981-2017. The study utilized the ex-

post facto research design because the data was taken in the form of the Central Bank of Nigeria (CBN) 2018 Statistical Bulletin and World Bank data indicators. The dependent variable was the MSO and the explanatory variables were government capital expenditure which was further separated into administration services (GCEXA), economic services (GCEXE), social and community services (GCEXT), and transfers (GCEXT). The analysis was based on the Auto-Regressive Distributed lag (ARDL) model. The test of F-bound showed that the variables were in a long-run equilibrium; hence, the Error Correction Model (ECM) was then applied to ascertain the short-run relationships and the correction rate in case there was any disequilibrium in the model. The study revealed that GCEXA and GCEXT are positively correlated with MSO in the long-term but GCEXE and GCEXS are negatively correlated with MSO. It is notable that all factors have substantial effects on the MSO except GCEXS which has a minimal effect on the MSO. The paper advises that with such a long-term profound effect of the capital expenditure by the Nigerian government on administrative, economic, and transfer services to the manufacturing industry, the government ought to increase its budgetary allocation on the mentioned elements at the expense of reducing the budgetary allocation to social and community services. This means that the goal of capital expenditure (economic expansion) will be achieved through an increase in the manufactured output.

The present paper by Sultanuzzaman et al. (2019) investigates how export and technology led to the economic performance of the emerging Asian countries based on the Generalised Method of Moments (GMM) model in 2000-2016. In line with Solow economic growth model, the outcome finds a significant and positive impact of export and technology on the economic growth of the emerging Asian economies. The authors revealed that there was statistically significant and positive correlation between capital

investment and growth in manufactured exports. In particular, a 1 percent growth in capital expenditure was correlated with a 0.67 percent growth in manufactured exports. The paper stressed that investments to modernise production facilities and increase the industrial capacity had direct impacts on the improvement in the export competitiveness. In addition, nations that applied favorable industrial policies stimulating capital inflow in manufacturing had more successful experience in diversification and expansion of export base. The results indicate that capital deepening allows companies to satisfy the requirements of the quality and scale of the foreign markets which supports the significance of capital spending as the source of export expansion in developing economies.

Similarly, Gbolonyo (2019) in the study investigates the determinants of export diversification in Ghana. To this end, they are estimated by using their index to determine the level of export diversification. The paper analyzed yearly time series data during the years 1983 to 2016 to estimate the structural, economic/policy and macroeconomic determinants of the export diversification in Auto Regressive Distributed Lag (ARDL) model. The findings of this paper suggested that GDP per capita, real effective exchange rate, trade openness, foreign direct investment and infrastructure enhance both long-run and short-run export diversification, whereas terms of trade are more effective towards specialisation. Besides this, the growth in the processed and semi-processed exports was stronger in countries which channeled capital towards industrial belts and export processing areas. These results highlight strategic capital investments as crucial towards enabling a structural change and enhancing the competitiveness of the manufacturing sector in the global trade.

#### **2.4.2 Domestic Debt and Manufactured Exports**

Lotto (2018) has investigated the impact of domestic debt on the Tanzania economy in the period 1990-2015 through the Ordinary Least Squares (OLS) regression to identify the impact of domestic debt on the economy. The examination revealed that the relationship between the domestic debt and economic development of Tanzania is inverted, but low as reflected in the annual GDP growth rates. Predicted control variables that were related to the GDP were furthered. The negative, though statistically non significant effect on the GDP growth rate is of the inflation (INF) not of the gross capital formation (GCF). Also, the foreign direct investment (FDI) positively influenced the growth rate in GDP and the extent of exports (X) has a significant positive influence on GDP growth, which implies that the country that follows the export-led growth strategy reaps the benefits of the interaction with the global market. Growth in exports facilitates consumption of products hence growth in output; therefore, improvement in the economic performance is achieved when there is growth in the output of a particular nation. Lastly, the GDP growth rate was negatively affected concerning the government expenditure (GE) and could be potentially explained by higher government spending which could be offset by taxation or borrowing. The authors focused on the impacts of the domestic debt on the economic growth relative to the manufactured exports. Thus, the research may explore the implications of home-grown debt on the manufactured exports.

Babu et al. (2015) conduct an empirical study of how domestic debt in percentage of the Gross Domestic Product (GDP) affects economic growth in the East Africa Community (EAC) between the years 1990 and 2010. The findings show that domestic debt exerts a very positive impact on EAC growth rate of per capita GDP. The policy implication suggests to finance the sustainable levels of local borrowing in order to

stimulate growth. This paper describes the role of domestic debt in determining the economic growth of the EAC, but does not work out any direct correlation with the outputs of manufacturing in the area.

In Pegkas (2018), the author empirically examines the association between the multiple determinants of economic growth (investment, personal and government consumption, trade openness, population growth, and government debt) and the economic growth in the example of Greece. The implications of the results are that the variables are related in a long run. These are the positive contributions of the growth of investment, consumption of the privates and the government as well as free trade. Conversely, government debt and population growth has adverse long-term effects on economic development. In addition, the paper examines the break effects implication of the government debt and economic growth. The findings point out dependence of debts and growth as conditional to the disruptions of accumulation of debts. To be more exact, during the years before the year 2000, growth of the government debt-to-GDP ratio is linked to the slightest impacts on economic growth. Nevertheless, during the post-2000 years, the increase in the government debt triggered a steep decline in its effects on the economic growth to the degree that the effects turned negative. The dilemma that the policymakers are going through in Greece is to contain the growth rate in government debt and maintain a sustainable developmental path. The analysis entailed the impact of debt on the economy of Greece; hence, it is crucial to ensure that such an event can be realized by the East African Community. Concurrently, the paper failed to give special consideration to domestic debt rather addressed government debt in a broader context which left a gap on how this research can contribute significantly.

The purpose of the study by Ibrahim (2015) was to evaluate how the external debt of the state affects the economic growth of four East African countries. The countries

included are Kenya, Tanzania, Uganda and Rwanda. The analysis also discussed the risks and cost that are associated with public debt in the countries. The study used panel data between 1981 and 2014. The study revealed that external debt had negative economic growth in East Africa countries. However, domestic debt on the other hand did not have any significant effect on economic growth. Moreover, there was a positive relationship between capital stock and the growth of the economy. However, macroeconomic factors, such as the real interest rate, inflation rate and exchange rate showed no significant effect in economic growth. In the risk-cost analysis, the EAC nations were vulnerable to exchange rate risks in borrowing. Weak local currencies have increased the amount of debt in the population. This study analyzed the dynamics of external debt of the four East African countries. A study that analyzes the effect of the domestic government debt on Kenya manufactured exports to the EAC is a priority instead of external debt.

Hassan and Akhter (2012) aimed to analyze whether the government of Bangladesh can afford to overindulge in the use of the government sources of borrowing or not and this could cause adverse effects on the economy of the country. To achieve this aim, two models have been employed, the Public Debt Model, and the Growth Model. The Debt Model was applied to describe the nature and extent of the dependence between total public debt and a set of variables including the total consumption, manufactured sector growth, tax, subsidies, net exports and total government stock. The Debt Model describes the role played by domestic and foreign debt on the growth rate of the GDP of Bangladesh. The sample period is between 1980 -81 and 2011-12. The analysis indicated that there existed highly positive associations between total public debt and investment and total public debt and government reserves as well. The manufacturing industry on the hand is negatively related to the relations with government subsidies.

Nonetheless, it is not supported by robust statistical data that proves that external debt exerts a negative effect on the GDP growth. However, it was the opposite in the case of domestic debt where there was a negative correlation but was done with insignificant statistical significance. The researchers focused on Bangladesh; therefore, the EAC needs to be taken into account to identify the external validity of the findings. Additionally, there is also a need to survey specifically, the impacts of domestic debt on Kenya manufactured exports to the EAC.

Kamundia (2015) attempted to examine how the government debt influences the rate of investments by the population and the economic growth in the context of Kenya. The data employed in the study was between 1980 and 2013 in the form of time series. The Granger causality test was employed in order to establish the directional relationship that exists between the public debt and the private investments and between the economic growth and the public debts. The model was estimated by the ordinary least squares estimation. The granger causality analyses also revealed that a unique unidirectional causality relationship existed between debt and the internal investments and GDP growth. It has been observed that debt negatively influences the investment by people privately and also positively with references to growth in the economy. This implies that the extent of the private investments and the rate of economic growth largely depends on debt. Nonetheless, the study do not establish any correlation between the debt and the manufactured exports and they do not particularly refer to the domestic debt that is the primary focus of the current paper.

Ogunjimi (2019) conducted the study on the influence exerted by the constituents of the public debt on the diverse modalities of investment in Nigeria and the short term and long-term effects using the Autoregressive Distributed Lag (ARDL) framework

during the years 1981 to 2016. The empirical findings show that domestic debt positively affects both the short run and the long run investment in the individual level; domestic debt stimulates the growth of this type of investment but does not entice foreign direct investment. The results also indicated that, external debt stimulates investment (both short and long-term), crowded out investment by the government and does not affect foreign direct investment. Furthermore, the external debts influence different forms of investment in Nigeria more than the domestic debts. In addition, the results indicated that real GDP is a variable factor that would help to define the aspects of private investment and interest rate factors on any form of investment in Nigeria. The study failed to take into account the effect of debt on the exports manufactured to the EAC, therefore, a limited study within the EAC context is necessary.

Dritsaki (2013) analyzes the economic growth, exports and government debt in Greece that occurred between 1960 and 2011. The researchers conducted their study based on the implementation of the models of the vector error correction (VECM) and employed the methodology of the Granger causality to examine whether there is a causality between these aspects. The results show that there is short and long-term association between these variables. The results indicate that the Granger causality exists in one way between the exports and economic growth and by extension the government debt and the economic growth. Nevertheless, exports and government debt are not short-run causally related. The results show that there is one-way Granger-causality between the economic growth and the government debt.

Ngunjiri (2019) investigated the nature of domestic debt and its impact on the credit market within the private sector and export performance in the study of Kenya. According to the 2004 and 2016 time-series data, the test results indicated that

economic growth in Kenya had a negative relationship with the external debt repayment, outward foreign direct investment and the foreign exchange rate but none were significant. Such a crowding-out effect raises domestic interest rates and constrains the availability of low-cost financing to manufacturing enterprises, most of which depend on credit to grow and produce export goods. It was thus established in the study that the high level of domestic debt has an indirect negative impact on the performance of the manufactured exports by inhibiting the activities of the private sector, especially the capital intensive ones like the manufacturing industry. The authors suggest that the fiscal policy will be changed in an attempt to reduce the domestic debt and a reversion to the other less distortionary sources of finance.

In a regional study, Asante (2019) in his research study, evaluated the importance of country-level governance structures in the external debt-economic growth relationship based on a panel of 38 Sub-Saharan African countries between 1996 and 2016. The analysis employed the General Method of Moments of dynamic panel estimation of Arrelano and Bond. The findings show that the country-level governance institutions enhance the use of external debt to enhance economic growth in the Sub-Saharan African nations. The research highlighted the fact that manufactured exports are also more vulnerable to macroeconomic instability induced by unsustainable fiscal policy in comparison to primary commodities. In this regard, the authors suggest the increase of fiscal discipline, better debt management practices and specific policy support to the manufacturing segment to strengthen the export performance.

#### **2.4.3 Population Size and Manufactured Exports**

In a study, Nuroglu (2010) examined the bilateral trade flows and determinants among six major OIC (Organisation of the Islamic Conference) economies utilizing panel data

analysis, and cross-sectional data. She upgraded the basic model of gravity model of bilateral trade with parameters like population size and exchange rate volatility after which the enhanced version of the model was investigated using panel data. The study has revealed how the income and population of a country, geographical distances between two nations and the fluctuations of exchange rates have an effect on bilateral trade of two countries in the OIC framework. It is evident that this issue has been discussed in the manuscript using a strict scientific perspective, in which population magnitude plays an important role in the dynamics of trade in a country. The analysis revealed that the change in population size affecting the bilateral trade flows has a positive impact on the exporting country but it has negative impact on the importing nation.

Zhou (2019) expresses the point by Rostow about the role of a dominant sector in industrialisation process in the context of a general equilibrium model. A hypothetical situation would be a higher population that may lead to food shortage and break the process of industrialisation. However, the population growth may turn out to be beneficial to the manufacturing industry by adopting technologies that take advantage of increasing returns to scale. The sensitivity of the demand of agricultural products plays a very important role in determining whether improvements in technology in the agricultural sector or an increase in population will have a positive effect on the manufacturing sector. The increase in the population is a dynamic phenomenon: on the one hand, it will provide more labor force and increase the demand of the manufactured products, on the other, it will put pressure on the agricultural industry. When population size increases, it does not necessarily mean that there will be increased market of manufactured products. This is explained by the fact that there are diminishing marginal returns to labour in the agricultural sector and that more of the labour force is needed

to carry on agricultural production to maintain sufficient amount of food on the table as more and more people are added to the population. The comparison between China and Britain during the pre-Industrial era indicates that to sustain the development of industries, research and development are inevitable. The achievement of realising independent industrialisation requires a meeting point of a market sizable through demand, and the strong supply of technologies on the supply side.

Karimi et al. (2018) explore how the demographic ageing influences the trade of industrial goods between Iran and its major trading partners, in the period between 2000 and 2015. The research proved that the difference of demographics in countries is an instrument of comparative advantage in international trade. Considering that the effect of age on many skills is negative, population ageing leads to a reduced relative supply and an increased relative price of such time-depreciating skills. Therefore, industries whose competencies are more efficiently performed by younger workers will record an increase in productivity in those countries with a high proportion of youthful labour force whilst those in the countries of ageing workforce will record a reduction in the level of productivity. The results demonstrated that the population with a secondary education and 20-40 and 41-65 years age group had the positive and statistically significant effect on the exports in comparison with the population with elementary and advanced education. The results showed that human capital in the ageing groups of the population that are characterised by increased job skill creates a comparative advantage and enhances expansion in the exports of the countries.

In cross-country analysis, panel data in 80 developing countries reveal that there is a significant positive correlation between population and diversification of manufactured exports (Coulibaly 2019). His results are further incentives to governments in Africa to

increase the focus on economic diversification further and the quality of institutions in such a way that revenues of natural resources help in increasing non-resource tax revenue mobilisation on the continent. The presence of labour in the densely populated nations contributes to production and also increases competitiveness in the international markets. This work highlights the importance of demographic scale in steering the structural change towards manufacturing based export economies.

Ogunjimi (2019) conducted the study on the influence exerted by the constituents of the public debt on the diverse modalities of investment in Nigeria and the short term and long-term effects using the Autoregressive Distributed Lag (ARDL) framework during the years 1981 to 2016. The empirical findings show that domestic debt positively affects both the short run and the long run investment in the individual level; domestic debt stimulates the growth of this type of investment but does not entice foreign direct investment. The results also indicated that, external debt stimulates investment (both short and long-term), crowded out investment by the government and does not affect foreign direct investment. Furthermore, the external debts influence different forms of investment in Nigeria more than the domestic debts. In addition, the results indicated that real GDP is a variable factor that would help to define the aspects of private investment and interest rate factors on any form of investment in Nigeria. The study failed to take into account the effect of debt on the exports manufactured to the EAC, therefore, a limited study within the EAC context is necessary.

Dritsaki (2013) analyzes the economic growth, exports and government debt in Greece that occurred between 1960 and 2011. The researchers conducted their study based on the implementation of the models of the vector error correction (VECM) and employed

the methodology of the Granger causality to examine whether there is a causality between these aspects. The results show that there is short and long-term association between these variables. The results indicate that the Granger causality exists in one way between the exports and economic growth and by extension the government debt and the economic growth. Nevertheless, exports and government debt are not short-run causally related. The results show that there is one-way Granger-causality between the economic growth and the government debt.

Ngunjiri (2019) investigated the nature of domestic debt and its impact on the credit market within the private sector and export performance in the study of Kenya. According to the 2004 and 2016 time-series data, the test results indicated that economic growth in Kenya had a negative relationship with the external debt repayment, outward foreign direct investment and the foreign exchange rate but none were significant. Such a crowding-out effect raises domestic interest rates and constrains the availability of low-cost financing to manufacturing enterprises, most of which depend on credit to grow and produce export goods. It was thus established in the study that the high level of domestic debt has an indirect negative impact on the performance of the manufactured exports by inhibiting the activities of the private sector, especially the capital intensive ones like the manufacturing industry. The authors suggest that the fiscal policy will be changed in an attempt to reduce the domestic debt and a reversion to the other less distortionary sources of finance.

#### **2.4.4 Standard of Living and Manufactured Exports**

Malaysia and the selected top six trading partners (average of six between 1995 -2012) were examined with the gravity model and the pooled ordinary least squares (OLS) analysis (Lai and Bujang, 2016). The research also revealed the theory that applies in explaining trade between Malaysia and that of Heckscher-Ohlin and the Theory of

Linder. The analysis established that the theory of Linder can be applied depending on the sign of coefficient of the difference in GDP per capita.

Grančay et al. (2016) evaluate the empiric validity of Linder hypothesis in Visegrad countries (the Czech Republic, Hungary, Poland, and the Slovak Republic). The analysis employed a version of the gravity model and discovered that, on the provision that other variables are kept constant, Visegrad countries will have a propensity to trade with different countries whose per capita income level is similar to their own rather than trade with countries that are much wealthier or poorer.

The article by Jošić and Metelko (2018) examined the support of the Linder hypothesis when dealing with Croatia. A panel regression model was developed using 184 import partner countries of Croatia between 2000 and 2016 to explore the trade pattern of international trade of Croatia. Using the Linder effect as an absolute difference between the GDP per capita of the importing and the exporting country, it was concluded that, the Linder hypothesis could not be confirmed in Croatia.

Kahram, A. (2014), analyzed the bilateral trade of Iran Linder hypothesis. The analysis incorporated the difference in the terms of bilateral trade between Iran and trading partners on the Per Capita GDP of the countries to explain the impact of Linder. The empirical result obtained the strong Linder effect of the bilateral trade of Iran.

In the article by Saygili and Manavgat, (2014), the authors empirically tested the Linder hypothesis of bilateral trade between Turkey and the 30 major trading partners using panel data between the years 1995 and 2011. In addition, the evaluation based on the gravity type panel data model evaluated the Linder effect on bilateral trade between Turkey and the countries only with a similar income level (according to the World Bank classification: Upper middle income of sixteen countries) during the same period. The

findings indicated that there was a significant influence of the Linder variable on the intensity of imports in Turkey, yet not the hypothesis on the export side.

Bukhari et al. (2005) aimed at finding empirical evidence that can endorse the Linder theory of international trade in three countries in South Asia (Bangladesh, India, and Pakistan). This paper observed that these countries are more intensively trading with countries in other regions and with their close per capita income levels as is predicted by the Linder hypothesis.

## **2.5 Summary of Literature Review**

The aforementioned investigations identified deficiencies that required attention in this research. Most of these studies have examined the impact of capital spending, domestic debt, and population size on economic growth in general, rather than explicitly on manufactured exports. The analyses focusing on manufactured production, domestic debt, and population size were insufficient in number and did not provide adequate information for generalisation of the conclusions. No one examined the impact of capital investment, domestic debt, and population size on manufactured exports. Likewise, the EAC has not been extensively represented in these selected studies, indicating that it remains a promising area for investigation into the impact of the aforementioned variables on manufactured exports to the regional bloc. This work is valuable as it aims to address this particular gap. This study aims to examine the impact of capital investment, domestic debt, and population size on Kenya's manufactured exports to Uganda and Tanzania, serving as representatives of the EAC. The Empirical Literature Matrix table, located below Table 2.1, delineates the identified gaps and outlines how this study will address them.

**Table 2. 1: Empirical Literature Matrix**

<b>Domestic Debt</b>					
<b>SCHOLAR/ TITLE</b>	<b>STUDY</b>	<b>METHODOLOGY</b>	<b>FINDING</b>	<b>GAPS</b>	<b>REMEDY</b>
<b>Lotto (2018): <i>Domestic Debt and Economic Growth in Tanzania-An Empirical Analysis.</i></b>	Examined the impact of domestic debt on economic growth in Tanzania for the period 1990 to 2015	using the Ordinary Least Squares (OLS) regression method	The study found that there is an inverse but insignificant relationship between domestic debt and the economic growth of Tanzania as measured by GDP annual growth.	The study was looking at domestic debt on economic growth and not domestic debt on manufactured exports.	This research examines the effect of domestic debt on Kenya's manufactured exports, not economic growth.
<b>Babu et. al. (2015): <i>Effect of Domestic Debt on Economic Growth in the East African Community</i></b>	Empirically explores the effect of domestic debt, as a share of Gross Domestic Product (GDP), on economic growth in the East African Community (EAC) over the period 1990-2010.	This study was based on the Solow growth model augmented for debt.	The results show that domestic debt has a positive significant effect on the per capita GDP growth rate in the EAC.	This study shows how domestic debt affects the economic growth of the EAC, but does not relate directly to manufactured exports in the EAC.	This research establishes the effect of domestic debt on specifically Kenya's manufactured exports to Uganda and Tanzania.
<b>Pegkas (2018): <i>The Effect of Government Debt and Other Determinants on Economic Growth: The</i></b>	Empirically investigates the relationship between economic growth and several factors (investment, private and		The results indicated that the relationship between debt and growth depends on the debt breaks. Specifically, at debt levels before 2000, increases in the government debt-to-	The study was looking at debt effect on economic growth in Greece therefore we need to see if this could	This research focuses on the effect of specifically domestic debt on Kenya's manufactured exports to Uganda and Tanzania.

<b><i>Greek Experience;</i></b>	government consumption, trade openness, population growth and government debt) in Greece	GDP ratio are associated with insignificant effects on economic growth. However, as government debt rises after 2000, the effect on economic growth diminishes rapidly, and the growth impacts become negative.	be replicated in EAC. At the same time, the study took government debt generally and not specifically domestic debt, hence a gap for this research to fill.		
<b><i>Halima (2015): Effect of External Public Debt on Economic Growth: An Empirical Analysis of East African Countries</i></b>	Undertook a study to estimate the effect of external public debt on economic growth in four East African countries. These included Kenya, Tanzania, Uganda, and Rwanda.	The fixed effect and the random effects model estimation techniques	The study found that external debt hurt economic growth in East African Countries	This study looked at the external debt in four East African countries at its effect on growth.	This study examines the effect of domestic government debt on Kenya's manufactured exports to Uganda and Tanzania, and not external debt.
<b><i>Hassan &amp; Akhter (2012): Impact of Public Debt Burden on Economic Growth: Evidence from Bangladesh;</i></b>	Had the objective of finding out whether the government of Bangladesh is excessively borrowing from public sources and thus negatively affecting the economy of the	Two models- the Public Debt Model and the Growth Model- were used.	The study showed a significant positive relationship exists between total public debt & investment and between total public debt & government reserves. On the other hand, a negative relationship exists between the	The study was based on Bangladesh and not the EAC; therefore, looking at the EAC would be important to find out whether the results can be generalized, and	This study focuses on the effect of domestic government debt on Kenya's manufactured exports to Uganda and Tanzania, and not general public debt.

	country. The study period is 1980-81 to 2011-12		manufacturing sector and government subsidy	also specifically look at domestic debt on Kenya's manufactured exports to the EAC.	
<b>Kamundia (2015): <i>The Effects of Public Debt on Private Investments and Economic Growth in Kenya (1980-2013). Unpublished Thesis.</i></b>	Aimed at finding out the effect of public debt on the level of private investment and economic growth in Kenya. The study used time series data from 1980 to 2013.	The Granger causality test was used to determine the direction of causality between public debt and private investments, and also between public debt and economic growth.	Debt was found to harm private investments and have a positive effect on economic growth.	This study does not link debt and manufacturing exports, nor does it specifically talk of domestic debt, which is the core of the research at hand.	This study establishes the effect of domestic government debt on Kenya's manufactured exports to Uganda and Tanzania.
<b>Ogunjimi (2019): <i>The impact of Public Debt on Investment.</i></b>	Investigated the impact of the components of public debts on the various forms of investment in Nigeria, both in the short-run and the long-run over the period, 1981-2016	Autoregressive Distributed Lag (ARDL) framework	The empirical results showed that domestic debt improves both private and public investment in the short run and long run	The study did not address the influence of debt on manufacturing exports to the EAC	This study focuses on the effect of domestic government debt on Kenya's manufactured exports to Uganda and Tanzania.
<b>Dritsaki (2013): <i>Causal</i></b>	Examines the relationship	vector error correction models	The results show that there is a unidirectional	The study is on Greece.	This study examines the effect of domestic government debt

<i>nexus between economic growth, exports and government debt</i>	between economic growth, exports and government debt of Greece over the period 1960-2011	(VECM), and they employed the Granger causality technique	Granger causality that runs from exports to economic growth as well as from economic growth to government debt, whereas there is no short-run causal relationship between exports and government debt.	on Kenya's manufactured exports to Uganda and Tanzania.
---	--	---	--	---

**Capital Expenditure**

<b>SCHOLAR/ TITLE</b>	<b>STUDY</b>	<b>METHODOLOGY</b>	<b>FINDING</b>	<b>GAPS</b>	<b>REMEDY</b>
<b>Chikelu &amp; Okoro (2016): <i>Impact of Capital Expenditure on the Manufacturing Sector of the Nigerian Economy</i></b>	Examined whether the low manufacturing sector's growth in Nigeria was a result of the poor allocation to capital expenditure, also whether there was any causal relationship between capital expenditure and the manufacturing sector's growth.	The Error Correction Mechanism (ECM) was employed after the Augmented Dickey-Fuller (ADF) unit root test, as well as the Johansen Co-integration analysis	The study showed a positive relationship between capital expenditure and manufacturing output in Nigeria.	This study looks at the relationship between capital expenditure and manufacturing output in Nigeria.	This study focuses on Kenya's capital expenditure and its specific influences on manufactured exports to Uganda and Tanzania.
<b>Nwanne (2015): <i>Implications of Government</i></b>	Investigated the effect of government capital expenditure on the	The study used quantitative time series data and multiple regression	The study points to a positive relationship between capital	There is a need to find out the effect on Kenya's manufactured	This study examines Kenya's capital expenditure specifically influences

<b>Capital Expenditure on the Manufacturing Sector in Nigeria.</b>	manufacturing sector output in Nigeria.	techniques in the analysis.	expenditure and the manufacturing sector.	exports to the EAC, hence the need for this study.	manufactured exports to Uganda and Tanzania.
<b>Emmanuel &amp; Oladiran (2015): Effect of government capital expenditure on manufacturing sector output in Nigeria</b>	Investigated the relationship between government expenditure and manufacturing sector output in Nigeria. The study employed time series data from 1970 to 2013.		This study shows a positive relationship between capital expenditure and manufacturing sector output, and therefore, the need to look at the effect on manufactured exports to the EAC to see if there could be similar findings.	The study looked at the effect of capital expenditure on the manufacturing sector output in Nigeria, but not on manufactured exports. The study was in Nigeria	This study focuses on how Kenya's capital expenditure specifically influences manufactured exports to Uganda and Tanzania.
<b>Maingi (2017): The Impact of Government Expenditure on Economic Growth in Kenya: 1963-2008</b>	Investigated the relationship between the components of government spending (including capital expenditure) and economic growth; examined the effects of components of government expenditure on GDP growth rate.	The study applied the Vector Auto Regression estimation technique using the annual time series data for the period 1963 to 2008	The Johansen co-integration tests revealed a long-run relationship between the GDP growth rate and the selected components of government expenditure.	The study looked at the relationship of government expenditure to GDP growth in Kenya but not her export to the EAC	This study establishes Kenya's capital expenditure specifically influences manufactured exports to Uganda and Tanzania.

<b>Udoka &amp; Anyingang (2015):</b> <i>The Effect of Public Expenditure on the Growth and Development of Nigerian Economy (1980-2012).</i>	Investigated the effect of public expenditure on the growth and development of the Nigerian economy (1980-2012).	An ex-post facto research design was adopted for this study. The data gathered was analysed using the Ordinary least squares multiple regression statistical technique	The result also indicated that capital expenditure had a significant effect on the growth and development of the Nigerian economy.	The study did not capture the effect of capital expenditure on manufactured exports and therefore leaves a gap to be filled in that area.	This study examines how Kenya's capital expenditure specifically influences manufactured exports to Uganda and Tanzania.
<b>Population size</b>					
<b>SCHOLAR/ TITLE</b>	<b>STUDY</b>	<b>METHODOLOGY</b>	<b>FINDING</b>	<b>GAPS</b>	<b>REMEDY</b>
<b>Nuroglu (2010);</b> <i>The impact of population on bilateral trade flows in the case of OIC</i>	Investigated bilateral trade flows and their determinants among six big OIC (Organisation of the Islamic Conference) economies by using panel data analysis and cross-sectional data.	Modified gravity model using panel data analysis.	Showed that the impact of population on bilateral trade flows is positive for the exporter country, while it is negative for the importer country.	Did not focus on the trade of manufactured goods within the EAC	The current study investigates the effect of population size on Kenya's manufactured Exports to Uganda and Tanzania
<b>Zhou (2019),</b>	Rostow's insight into the role of a leading sector in industrialisation	Rostow's insight of the role of a leading sector in industrialisation in a	Population growth is a double-edged sword: it may provide a greater number of workers and a	The study did not focus on the trade/export of manufactured	The current study considers the effect of population size on Kenya's manufactured

		general equilibrium model	larger market for the manufacturing sector, but it may also strain the agricultural sector.	goods within the EAC	Exports to Uganda and Tanzania
<b>Karimi et al. (2018)</b>	Population ageing on trade of industrial products in major trade partners of Iran during the period 2000-2015.	Used age-dependent skills in the theoretical model of Ricardian and Heckscher–Ohlin's comparative advantage by Chor (2010).	The paper showed that demographic differences between countries are a source of comparative advantage in international trade.	The study did not focus on the EAC	The current study establishes the effect of population size on Kenya's manufactured Exports to Uganda and Tanzania
Standard of Living					
<b>SCHOLAR/ TITLE</b>	<b>STUDY</b>	<b>METHODOLOGY</b>	<b>FINDING</b>	<b>GAPS</b>	<b>REMEDY</b>
<b>Lai and Bujang, (2016), The Heckscher-Ohlin versus Linder's Theory: evidence from Malaysian exports</b>	This paper analysed the export destinations of Malaysia and the top six trading partners (an average from 1995 - 2012)	The gravity model and pooled ordinary least squares (OLS) analysis	The paper concludes that Linder's theory is applicable based on the coefficient sign of the GDP per capita differential.	The study focused primarily on Malaysia and excluded African regional trade blocs like the East African Community (EAC).	This gap is addressed by the present study, which focuses specifically on Kenya's manufactured exports to Uganda and Tanzania, two of its closest income-level and geographic partners
<b>Jošić &amp; Metelko, (2018), Testing the validity of the Linder</b>	This paper aimed to analyse the validity of the Linder hypothesis in the case of Croatia	The empirical strategy involved enhanced gravity models with	They found that countries with converging income levels tended to trade more in consumer-based manufactured goods	Its limitation lies in the exclusion of low-income economies and trade	This current study builds on this evidence by examining similar dynamics within the African context.

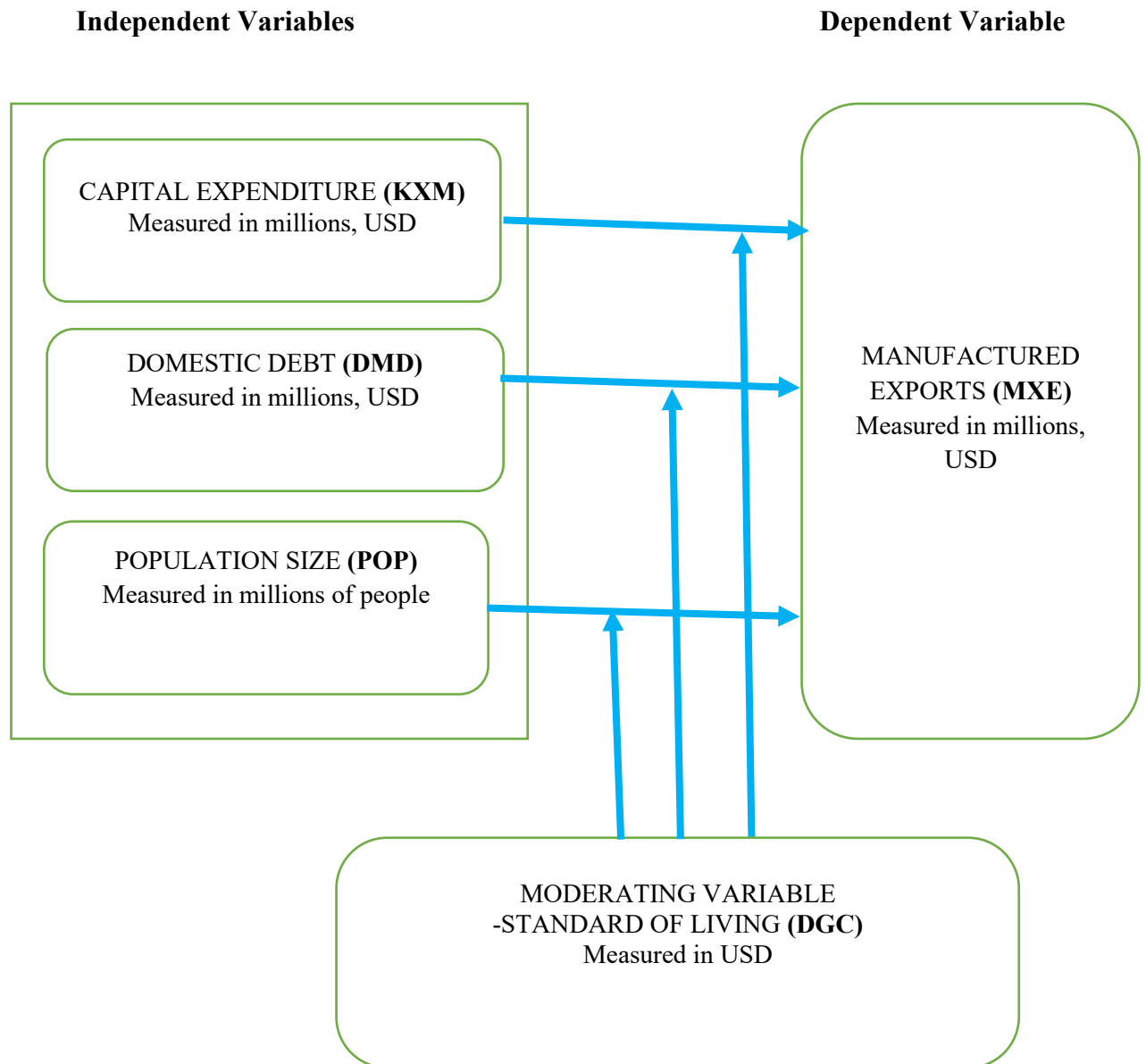
---

<i>hypothesis for Croatia.</i>	income indices	similarity	relationships between developing countries, such as Kenya, Uganda, and Tanzania.			
<b>Saygılı &amp; Manavgat, (2014), Linder Hypothesis: ‘An Empirical Analysis on Turkey’s Foreign Trade’.</b>	The paper tested the empirical validity of the Linder hypothesis for Turkey’s bilateral trade with its 30 major trading partners using panel data analysis for the period 1995-2011	panel model using the gravity	regression using the	The results showed a significant effect of the Linder variable on Turkey’s import intensity, but did not support the hypothesis on the export side.	Its limitation lies in the exclusion of low-income economies and trade relationships between developing countries, such as Kenya, Uganda, and Tanzania.	This study fills that gap by concentrating on Kenya’s manufactured exports to Uganda and Tanzania and exploring how income levels of the trading partners moderate export performance.

---

**Source:** Author (2024)

## 2.6 Conceptual Framework



**Figure 2. 1: Conceptual Framework**

**Source:** Author (2024)

In this study, the independent variables are capital expenditure, domestic debt and Population size. The moderating variable is the standard of living studied as an absolute value of the differential GDP per Capita between Kenya and its trading partners.

High capital expenditure in the country increases the stock of infrastructure, lowering the cost of production and improving the ease of doing business, leading to the growth of manufacturing and its exports.

An increase in domestic debt squeezes the private sector to the periphery of the domestic credit market since lenders prefer lending to the government, which is a low-risk borrower compared to the private sector. The private sector, therefore, lacks access to capital for expanding its business. This discourages the growth of manufacturing and exports.

The population creates a demand-pull that leads to the importation of Kenya's exports. According to Linder's hypothesis, the standard of living studied as differential GDP per capita in theory affects the quantity and type of trade between trading partners. The lower the difference, the more similar the demand structure of the two countries, hence similar tastes and preferences. This leads to the two countries producing similar but differentiated products and trading more amongst themselves, hence a high proportion of bilateral trade taking place.

The commerce between two countries is potentially more intensive when their demand structures are more similar (Linder 1961).

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Overview of the Chapter

This chapter presents the methodology used, clearly explaining the research design and execution of the study. It includes descriptive statistics of variables such as standard deviation, variance, mean, minimum and maximum. Pre-estimation diagnostic tests such as kurtosis, skewness and panel unit root test are also presented. In addition, post-estimation diagnostic tests, regression results and lastly, the Hausman test results.

#### 3.2 Research Design

The research employed a correlational design. A correlation research design represents a particular methodological approach employed to elucidate the relationship between or among variables. It offers empirical evidence indicating the potential relationship between two or more variables and the significance of that relationship. This design was appropriate for the study as it offered empirical evidence regarding the correlation between Kenya's manufactured exports to Uganda and Tanzania, and the variables of capital expenditure, domestic debt, and population size. This notion enables an investigator to amass additional data and ascertain both the intensity and orientation of the relationship. The correlational design was required to determine the relationship between variables manufactured exports, capital investment, domestic debt, and population size, all affect Kenya's manufactured export growth. The descriptive statistics elucidated the overarching trends of the study variables through the utilisation of mean, standard deviation, minimum and maximum values, as well as skewness and kurtosis.

### 3.3 Study Area

This study focused on three founding member states of the East African Community (EAC): Kenya, Uganda, and Tanzania, located in the eastern region of the African continent. These countries were selected based on their critical role in intra-regional trade, particularly concerning Kenya's export performance. According to the EAC Trade and Investment Report (2018), Uganda and Tanzania together accounted for 70 per cent of Kenya's total exports to the EAC, underscoring their significance as Kenya's key regional trading partners. The East African Community (EAC) is a regional intergovernmental organization composed of six member states: Burundi, Kenya, Rwanda, South Sudan, the United Republic of Tanzania, and the Republic of Uganda, with its headquarters in Arusha, Tanzania. This study specifically concentrated on Kenya, Uganda, and Tanzania due to their long-standing trade relations, geographical proximity, and foundational membership in the EAC since the ratification of the EAC Treaty. Geographically, these countries lie between latitudes 6°N and 11°S and longitudes 30°E and 42°E. The region is bordered by South Sudan and Ethiopia to the north, Somalia and the Indian Ocean to the east, Mozambique, Malawi, and Zambia to the south, and the Democratic Republic of Congo, Rwanda, and Burundi to the west. Their strategic position within the continent enhances their accessibility and integration in regional markets, making them ideal for analysing the dynamics of manufactured exports within the EAC bloc. A map of the study area is provided in **Appendix I**.

### 3.4 Data Description, Measurement and Sources

The researcher used secondary data as summarised below.

**Table 3. 1: Summary of Variables used in the study**

<b>Variable and Symbol</b>	<b>Description</b>	<b>Measurement</b>	<b>Source</b>	<b>Expected Sign</b>
<b>Manufactured Export (MXE)</b>	These are the sum of low-tech, medium-tech and high-tech goods that a country exports	Million USD	KEPOBA and KNBS Annual Statistical Abstracts	NA
<b>Capital Expenditure (KXM)</b>	This is the part of the government spending that goes into the creation of assets	Million USD	KNBS Annual Statistical Abstracts	+ve
<b>Domestic Debt (DMD)</b>	This is the stock of money domestically sourced by the government at any time in the past and not yet repaid. They include Treasury Bills and Treasury Bonds	Million USD	KNBS Annual Statistical Abstracts and the CBK	+ve/ -ve
<b>Population (POP)</b>	This is a group of human beings living and interbreeding within a given area (a country in the case of this study)	Millions	KNBS Annual Statistical Abstracts and Kenya Public Expenditure reports.	+ve
<b>Differential GDP per Capita as a proxy for Standard of Living (DGC)</b>	This is the difference between the GDP per capita of the two countries. It's used to measure the difference in the standard of living between countries	USD	Online World Bank Data	-ve
<b>Distance</b>	This denotes the topographical space quantified in kilometres (km) between the various economic zones in Kenya as well as its trading partners, as the bird flies.	KM	Online World Bank Data	-ve
<b>Gross Domestic Product (GDP)</b>	This is the total gross value added by all resident producers in the economy.	Billions USD	Online World Bank Data	+ve
<b>Common Boundary (CMB)</b>	A state where countries share an international boundary	Yes (1) or No (0)	_	+ve
<b>Common Colony (CMC)</b>	A state where countries share a colonial power.	Yes (1) or No (0)	_	+ve

Source: Author's compilation, 2024

### **3.5 Data Processing and Analysis**

The process of data handling encompasses four distinct phases: the initial coding of the data, subsequent cleaning, thorough screening of the data, and the careful selection of a suitable analytical strategy for hypothesis testing. Coding entails the allocation of numerical symbols to streamline data entry, reduce the likelihood of errors, and enhance subsequent analyses.

### **3.6 Data presentation**

This section presents the data used to examine the effect of selected macroeconomic aggregates on Kenya's manufactured exports to Uganda and Tanzania from 2007 to 2018. The variables of interest include capital expenditure (KXM), domestic debt (DMD), and population size (POP), with the standard of living in trading partner countries (DGC) serving as a moderating variable. Data for Kenya's manufactured exports to Uganda and Tanzania were obtained from the Kenya National Bureau of Statistics (KNBS) and the Central Bank of Kenya (CBK). Data on macroeconomic variables were sourced from official government publications, the World Bank Development Indicators (WDI), and the International Monetary Fund (IMF). The period under review, 2007 to 2018, was chosen to align with the post-ratification era of the EAC Treaty and the launch of Kenya's Vision 2030 development agenda. Annual time-series data were compiled for each variable and organised into tables and figures for easy interpretation. Summary statistics, trend graphs, and correlation matrices were used to illustrate patterns and relationships among the variables. This data forms the foundation for further analysis in the subsequent sections.

### **3.7 Descriptive statistics**

Aldous (2016), states that raw data should be used while analysing descriptive statistics and not transformed data. First, the mean of each variable was calculated to give the measure of central tendency that represents the average value of a particular variable. Secondly, standard deviation was also calculated to show the measure of dispersion of each variable, explaining how far the observations are from the sample average.

Thirdly, it was necessary to check for kurtosis and skewness of each variable to measure their normality. Kurtosis measures the flatness or peakedness of a distribution (Mittelhammer, 2013). When the data has a normal distribution with a kurtosis of 3, it is called Mesokurtic. On the other hand, when data has a peaked curve (positive kurtosis), it is known as Leptokurtic, meaning it has higher values compared to the sample mean. Similarly, if a flatted-curved (negative kurtosis), it is referred to as Platykurtic, implying that it has more lower values than the sample mean.

Skewness is used to measure the degree of asymmetry. A distribution is termed to have normal skewness if it is symmetric around the mean and has a skewness value of 0. On the other hand, a distribution is said to have a positive skewness if it has a long right tail, implying that it has more higher values compared to the mean. Positive skewness begins from a value higher than 0.5 (Aldous, 2016). Negative skewness means that the distribution has a long left tail, indicating that it has more lower values compared to the sample mean. Negative skewness begins from -0.5. Finally, the maximum and minimum show the highest and lowest values in each variable.

### **3.8 Correlation Analysis**

Correlation analysis helps to establish the type of relationship between different variables, that is, the strength and direction. The relationship can either be negative, positive or neutral. If the correlation value is +1 or close to that, then there is a strong

positive correlation. Similarly, if the correlation value is -1 or close to that, it means there is a strong negative correlation (Baker, 2018). However, if the correlation value is closer to 0, there is a weak correlation, while 0 means it is neutral or there is no correlation. Pairwise correlation analysis was performed to determine the direction and nature of association between variables in this study.

### **3.9 Model Specification**

The research employed the gravity model and was informed by the Linder Hypothesis (LH). The gravity model employs the concept of gravitational force as an analogy to elucidate the volume of commerce, financial movements, and migration across countries globally (Zhou, 2019). The gravity model quantifies bilateral trade flows between geographical entities, correlating trade volume between two nations with their GDP and the distance separating them (Batra, 2006).

The equation of the gravity model can be shown as follows:

#### **Equation 1: Model Specification I**

$$F_{ij} = G * M_i M_j / D_{ij}$$

In this context, F represents the trade flow, specifically the manufactured exports. The variables  $M_i$  and  $M_j$  correspond to the economic mass of each nation, quantified by their GDP. The term  $D_{ij}$  signifies the estimated distance separating the capitals of the respective countries, while G denotes a constant of proportionality. To facilitate a more straightforward estimation of the econometric method, equation (1) may be reformulated as follows:

#### **Equation 2: Model Specification II**

$$F_{ij} = G(\beta_1 M_i \beta_2 M_j / \beta_3 D_{ij}) \varepsilon_{ij}$$

In equation (3),  $F_{ij}$  denotes the trade volume between country  $i$  and country  $j$ , specifically referring to manufactured exports.  $M_i$  and  $M_j$  signify the economic indicators for country  $i$  and country  $j$ , represented by their GDP.  $D_{ij}$  indicates the distance between the capitals of the two countries, serving as a measure of trade resistance, while  $\epsilon_{ij}$  represents the error term, with an expected value of 1.

To simplify the estimation of trade flow, a logarithmic transformation was applied to both sides of equation (3):

**Equation 3: Basic Model in Linear Form**

$$\ln F_{ij} = \beta_0 + \beta_1 \ln(M_i) + \beta_2 \ln(M_j) - \beta_3 \ln(D_{ij}) + \epsilon_{ij}$$

The notation used in equation (4) is as follows:  $F_{ij}$  refers to the trade flows between the country  $I$  and country  $J$ ;  $M_i$  and  $M_j$  are the economic factors of country  $I$  and country  $J$ , respectively;  $D_{ij}$  is the distance between the two countries and; epsilon  $\epsilon_{ij}$  is the error term, which should have a value of 1.

Upon employing the natural logarithm transformation, the economic model was constructed as a linear regression framework. Gul and Yasin (2011) elucidated that “the equation of the gravity model is frequently converted into a linear form to align with conventional regression analysis.” Furthermore, as initially proposed by Tinbergen (1963) and Linnemann (1966), a substantial number of empirical studies have subsequently adhered to the log-linearised form (Siliverstovs & Schumacher, 2009). Furthermore, it represents one of the simplest techniques for elucidating the relationship between dependent and independent variables, as demonstrated in equation (4).

**3.9.1 Basic Gravity Model**

This study employed the following regression function to assess the impact of distance and GDP on the trade volume between Kenya and its trading partners:

#### Equation 4: Basic Gravity Model

$$\ln MXP_{kjt} = \beta_0 + \beta_1 \ln(GDP_{kt}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(DIS_{kjt}) + \varepsilon_{kjt}$$

The variables are defined as:

k: Kenya:

j: the two trading partners of Kenya's manufactured exports

t: time

MXP: the quantitative assessment of bilateral manufactured trade flow between Kenya and its trading partners, expressed in millions of USD.

The GDP represents the absolute value of real gross domestic product quantified in billions of USD.

DIS: the distance in kilometres between Kenya's economic hubs and its trading partners

$\varepsilon$ : error term.

Two conventional variables of a gravity model are incorporated: GDP and DIS. The GDP signifies the magnitude of an economy. DIS quantifies the geographical distance between Kenya's economic centres and those of its trading partners. Due to the opposite relationship between trade and distance, the distance coefficient  $\beta_3$  is expected to have a negative sign, although the GDP of Kenya and its trading partners is projected to have a positive  $\beta_1$  and  $\beta_2$  value.

### 3.9.2 Augmented Gravity Model

As explanatory variables, capital expenditure, domestic debt, population size, and the difference in GDP per capita (as a moderating variable and to test the Linder hypothesis) are used to figure out the amount of manufactured goods that Kenya sends to its two trading partners.

In 1961, Staffan Burenstam Linder presented a seminal work that explored both the theoretical frameworks and empirical observations regarding the dynamics of international trade patterns. Linder's approach suggests that domestic demand plays a crucial role in shaping trade and production. As preferences and demand patterns tend to align more closely between neighbouring countries, the composition of their trade commodities exhibits greater similarity, resulting in increased bilateral trading volumes between these nations. Given that the Linder hypothesis indicates that the similarity in per capita income serves as a determinant of bilateral trade patterns (Choi, 2002), it follows that the Linder hypothesis can be formulated as a modified gravity-type trade model, as illustrated in Equation (5).

DGC served as the paramount independent variable in this equation when evaluating Linder's Hypothesis, as it quantified the disparity in income between two trading partners. When the GDP per capita of two nations is comparable, the variable representing income similarity tends to decrease, while the dependent variable, trade, increases. Conversely, it holds that when the GDP per capita of two nations diverges significantly, the variable representing income similarity will increase, while the dependent variable, trade, will decrease. Consequently, the coefficient associated with the variable exhibits a negative sign.

This study applied the following regression function:

**Equation 5: Augmented Gravity Model**

$$\begin{aligned} \ln MXP_{kjt} &= \beta_0 + \beta_1 \ln(GDP_{kt}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(KXM_{kt}) \\ &+ \beta_4 \ln(DMD_{kt}) + \beta_5 \ln(POP_{kt}) + \beta_6 \ln(DIS_{kjt}) \\ &+ \beta_7 \ln(DGC_{kjt}) + \beta_8 \ln(CMC_{kjt}) \\ &+ \beta_9 \ln(CMB_{kjt}) \\ &+ \varepsilon_{kjt} \end{aligned}$$

The variables are defined as:

*k*: Kenya

*j*: Either of the two trading partners, that is, Uganda or Tanzania

*t*: Time

*MXE*: The monetary value of the bilateral trade flow in manufactured goods between Kenya and its trading partners, expressed in millions of USD. The gross domestic product is quantified as the absolute value of real GDP in USD, expressed in billions of USD.

*DIS*: the geographic separation, expressed in kilometres (KM), between Kenya's trading partners and its economic hubs. Capital expenditure (quantified in millions of USD)

*KXE*: Capital expenditure (quantified in millions of USD) Capital expenditure

*DMD*: Domestic debt, quantified in millions of USD.

*POP*: The quantification of population magnitude expressed in millions

*DGC*: Absolute value of per capita GDP differential between Kenya and its trading partners measured in USD.

*CMC*: Common colony

*CMB*: Common border

$\mathcal{E}$ : error term.

The GDP and POP, KXM, CMC and CMB coefficients:  $\beta_1, \beta_2, \beta_3, \beta_5, \beta_8$  and  $\beta_9$ , are expected to be positive. The DGC and DIS coefficients  $\beta_6$  and  $\beta_7$  are expected to comprise negative signs. DMD coefficient  $\beta_4$  was expected to comprise either a positive or a negative sign. The dummy variables, Common Colony (CC) and Common Border (CB), will either be 1 for present or 0 for absent.

### 3.10 Panel Unit Root Tests

The unit root test assessed the stationarity of the data. A data series is considered stable if its mean and variance remain constant across time, and the covariance between two time periods is only determined by the distance or lags separating them (Gujarati & Porter, 2010). The utilisation of a unit root test for pooled time series and panel data can substantially enhance the test's power (Levin, Lin, & Chu, 2002). Testing for unit roots was essential, as regressing non-stationary panel series data results in misleading regression. If the series is nonstationary, they are differenced until it achieves stationarity. This study utilised the Levin, Lin, and Chu (2002) test and the Harris-Tzavalis test for robustness.

#### 3.10.1 Levin-Lin-Chu Test

The Levin-Lin-Chu panel data unit root test was conducted on the subsequent model:

#### Equation 6 : Levin-Lin-Chu Model

$$\hat{\rho}_{yi}^2 = \frac{1}{T-1} \sum_{t=1}^T \Delta Y_{it}^2 + 2 \sum_{L=1}^{\bar{K}} \omega \bar{K} L \left[ \frac{1}{T-1} \sum_{t=2+L}^T \Delta Y_{it} \Delta Y_{it-L} \right]$$

Where  $\varepsilon_t$  is a white noise process,  $\rho = 1$  indicates a unit root  $0 < \rho < 1$  implies stationarity (Levin, Lin and Chu, 2002; Phillips and Moon 1999, Phillips and Moon 2000). Levin, Lin, and Chu (2002) proposed a panel unit root test for the null hypothesis of unit root against a homogeneous stationary hypothesis.

### **3.10.2 Harris-Tzavalis Test**

Utilized to deliver precise adjustments for minor values, wherein they strictly limit the model to omit the augmenting lags. Consequently, if the initial panel is equilibrated (as mandated), it will maintain its balance. They also presume a uniform variance, which the Levin-Lin-Chu test does not. The test, as executed, uses  $Y_{it}$  as the dependent variable instead of  $\Delta Y_{it}$ , indicating that the test is for  $\rho = 1$  rather than  $\rho = 0$ . The asymptotics exhibit huge  $N$  and fixed  $T$ , with the centred and rescaled test statistic following a normal distribution  $N(0, 1)$ .

### **3.11 Hausman Test**

The Hausman test, as utilised by Green (2008), was employed to determine the appropriate choice between fixed and random effects. It examines the potential correlation between the distinct errors ( $\mu_i$ ) and the regressor. The null hypothesis of Hausman's test posits that the random effect model is suitable, in contrast to the alternative hypothesis, which asserts the appropriateness of the fixed effect model. Should the probability of the test exceed a 5 per cent significance level, a random effect is employed; conversely, a fixed effect is utilised.

### **3.12 Descriptive Statistics**

The descriptive statistics are presented in Table 4.1.

**Table 4.1: Descriptive Statistics**

Variables	Obs	Mean	Std. Dev.	Min	Max	Skew.	Kurt.
MXE	24	5.450e+08	1.620e+08	2.741e+08	8.452e+08	.038	1.989
KXM	36	2.070e+09	1.530e+09	7.382e+08	9.610e+09	3.468	17.49
DMD	36	5.590e+09	4.380e+09	1.350e+09	1.949e+10	1.58	4.857
POP	36	43100000	6770000	29490000	56310000	-.136	2.448
GDP	36	4.210e+10	1.870e+10	1.191e+10	9.221e+10	.853	3.212
DIS	24	588.56	86.225	504.15	672.97	0	1
CMC	36	1	0	1	1	.	.
CMB	36	1	0	1	1	.	.
DGC	24	554.012	354.534	244.8	1952.7	2.669	11.199

**Source:** Author's Computation from Stata Version 17 (2024)

From the table above, Kenya's manufactured exports (MXE) reported a mean of USD 545.0M, a minimum of USD 274M, a maximum of USD 845.25M and a standard deviation of USD 162.0M. Further, the variable has a skewness of 0.038 ( $0 < 0.038 < 0.5$ ), implying that the variable has a normal skewness and a kurtosis of  $1.989 < 3$ , indicating a negative distribution, that is, it has more lower values compared to the sample mean, thus platykurtic.

Gross Domestic Product (GDP) reported a mean of USD 42.1B, a minimum of USD 11.91B, a maximum of USD 92.21B and a standard deviation of USD 18.7B. Further, the variable has a skewness of ( $0.5 < 0.853$ ), implying that the variable has a positive skewness and a kurtosis of  $3.212 > 3$ , indicating positive distribution, hence Leptokurtic, meaning it has higher values than the sample mean.

Capital Expenditure (KXM) reported had a mean of USD 2,070M, a minimum of 738.2M and a maximum of USD 9,610.3M, and a standard deviation of USD 1,530M, which is also a small variation from the mean. This indicates that all the EAC countries have similar capital expenditures. Further, it has a skewness of  $3.468 > 0.5$ , meaning it has a positive skewness and kurtosis of  $17.49 > 3$ , indicating positive distribution, hence Leptokurtic, meaning it has higher values than the sample mean (more values lie on the right-hand side).

Domestic Debt (DMD) had a mean of USD 5,590M, a minimum of USD 1,350M and a maximum of USD 1,949M. Its standard deviation is USD 4,380M, a small variation from its mean. This indicates that all the EAC countries have almost the same Domestic Debt. A closer look, however, shows Kenya's annual borrowing (a mean of 10162 million USD) is much higher than her neighbours (Uganda - a mean of 2,420.80 million USD and Tanzania- a mean of 4184.33 million USD). Additionally, it has a skewness of  $1.58 > 0.5$ , meaning it has a positive skewness and kurtosis of  $4.857 > 3$ , hence Leptokurtic, meaning it has higher values than the sample mean.

Population size (POP) registered a mean of 43.10M, a minimum of 29.49M, a maximum of 56.31 M and a standard deviation of 6.77M, a normal skewness of 0.136 ( $0 < 0.136 < 0.5$ ) meaning it is closer to the mean and a kurtosis value of  $2.448 < 3$  implying that it is negatively distributed thus platykurtic.

The Differential GDP Per Capita (DGC), which is a proxy for the standard of living, reported a mean of USD 554.012, a minimum of USD 244.8, a maximum of USD 1952.7 and a standard deviation of USD 354.534. It has a skewness of  $2.669 > 0.5$ , meaning it has a positive skewness and kurtosis of  $11.199 > 3$ , indicating positive distribution, hence Leptokurtic, meaning it has higher values than the sample mean.

Distance (DIS) reported a minimum of 504.15 KM and a maximum of 672.97 KM, indicating the furthest city from Nairobi city. This is the distance between Nairobi and Dar es Salaam. It had a skewness of  $0 < 0.5$ , meaning it has a normal skewness and kurtosis of  $1 < 3$ , indicating a negative distribution of the data, hence platykurtic.

### 3.13 Post-Diagnostic Tests

#### 3.13.1 Multi-collinearity

When independent variables in a multivariate regression model demonstrate interdependence or a deficiency of independence, this phenomenon is referred to as multicollinearity. The extent of multicollinearity holds considerable importance due to its prevalence among variables. For an OLS regression to yield valid results, each independent variable must remain entirely distinct from all other independent variables.

The variance inflation factor (VIF) was utilised to assess the existence of multicollinearity within the estimated Vector Error Correction Model (VECM). VIF quantifies the extent to which the variance in the slope estimates has been amplified. Elevated VIFs indicate a rise in the variances of estimated regression coefficients attributable to collinearity among predictor variables, in contrast to the variances observed when predictors are orthogonal (Murray *et al.* 2012). Models characterised by multicollinearity exhibit diminished precision and encounter challenges in forecasting (Midi, Sarkar & Rana, 2010). The variance inflation factor for each independent variable within the model is calculated. The computation of VIF is carried out using the following equation:

#### Equation 7: VIF

$$VIF_k = \frac{1}{1 - R_k^2}$$

The variance inflation factor, denoted as  $VIF_k$ , pertains to each independent variable within the model, while  $R_k^2$  represents the coefficient of multiple determination for the variable  $k$ .

In instances where multicollinearity is pronounced, the ordinary least squares estimates and their corresponding standard errors exhibit considerable sensitivity to variations in the observational data (Gujarati, 2009). Values exceeding ten would suggest the existence of multicollinearity.

### 3.13.2 Woolridge Test for Serial Correlation

The Wooldridge test was employed to assess the serial correlation of residuals. In the realm of statistics, serial correlation refers to the association between independent variables and their lagged counterparts across different temporal intervals. Recurring patterns frequently exhibit serial correlation, wherein the magnitude of a variable influences its subsequent magnitude. Should the variables exhibit identical independent distribution, one would find that the serial correlation is null. In light of the subsequent equation as articulated by Durbin & Watson (1971):

**Equation 8: Durbin- Watson equation for serial correlation**

$$\sum (y_i - y_{i-1})^2 = \sum (y_i^2 + y_{i-1}^2) - 2 \sum y_t y_{t-1}$$

Suggests that a serial correlation can be studied in terms of  $\sum (y_t - y_{t-1})^2$ . It is also appropriate to evaluate the independence of  $y_1 \dots y_n$  in contrast to the hypothesis that  $y_1 \dots y_n$  adhere to an autoregressive process. The detection of serial correlation can be accomplished by calculating the Durbin-Watson statistic.

### 3.13.3 Cook-Weisberg/ Breusch-Pagan Test for Heteroscedasticity

The research employed the Breusch-Pagan test to ascertain the presence of heteroskedasticity. Heteroscedasticity indicates that the error term exhibits variability in its variance, in contrast to the classical linear regression model's assumption of constant variance among the error terms. The null hypothesis posits that the error terms exhibit constant variance, thereby indicating homoscedasticity.

### **3.14 Ethical Considerations**

It is essential to examine the ethical ramifications of the study process (Mugenda & Mugenda, 2003). The research predominantly utilised secondary data sources, and hence, the material acquired was duly cited.

The researcher secured a letter from the university authorising access to pertinent information from other institutions during the research process and obtained a research permit from the National Commission for Science, Technology and Innovation (NACOSTI) to conduct the study. Upon conclusion of the study, the results were disseminated via publication in peer-reviewed journals.

## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION AND DISCUSSION

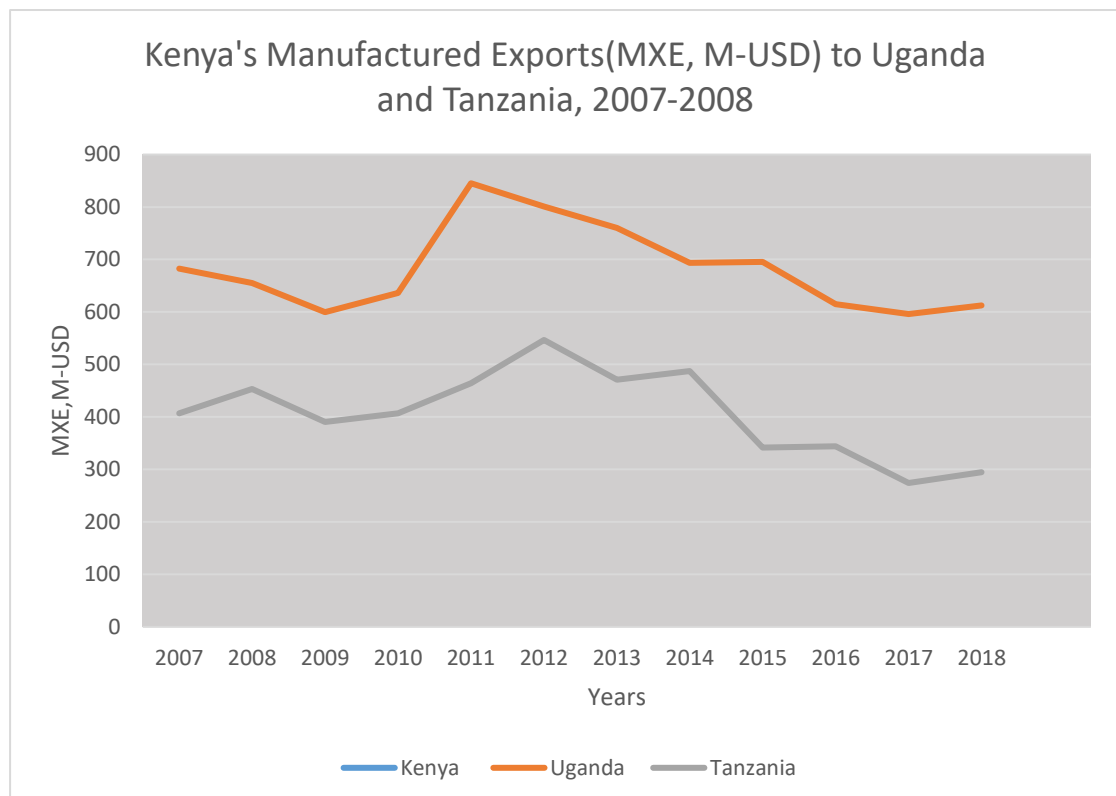
#### 4.1 Overview of the Chapter

This section includes descriptive statistics of variables such as standard deviation, variance, mean, minimum and maximum. Pre-estimation diagnostic tests such as kurtosis, skewness and panel unit root test. Lastly, post-estimation diagnostic tests, regression results, the Hausman test results, a test of hypotheses and a discussion of results.

#### 4.2 Pre-Estimation Checks

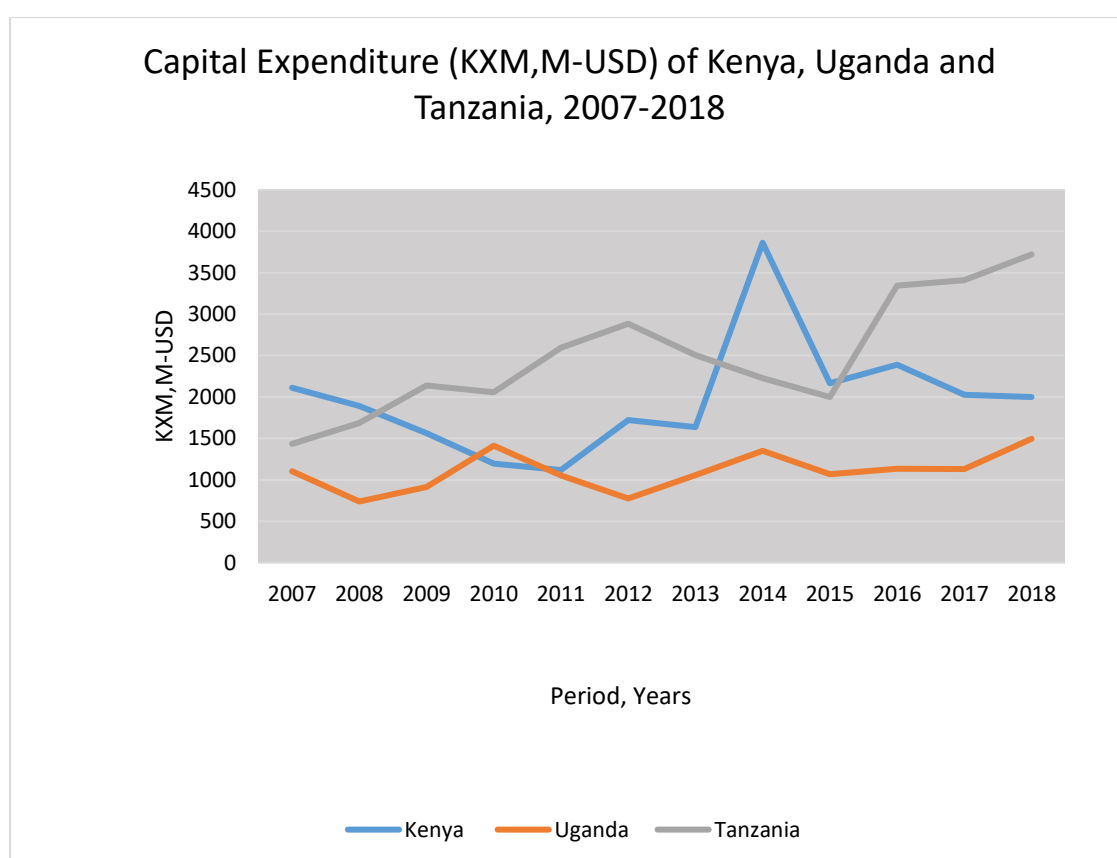
##### 4.2.1 Visual Presentation of Variables

**Figure 4. 1: Graphical presentation of variables**



**Source:** Author's computation based on MS Excel (2021)

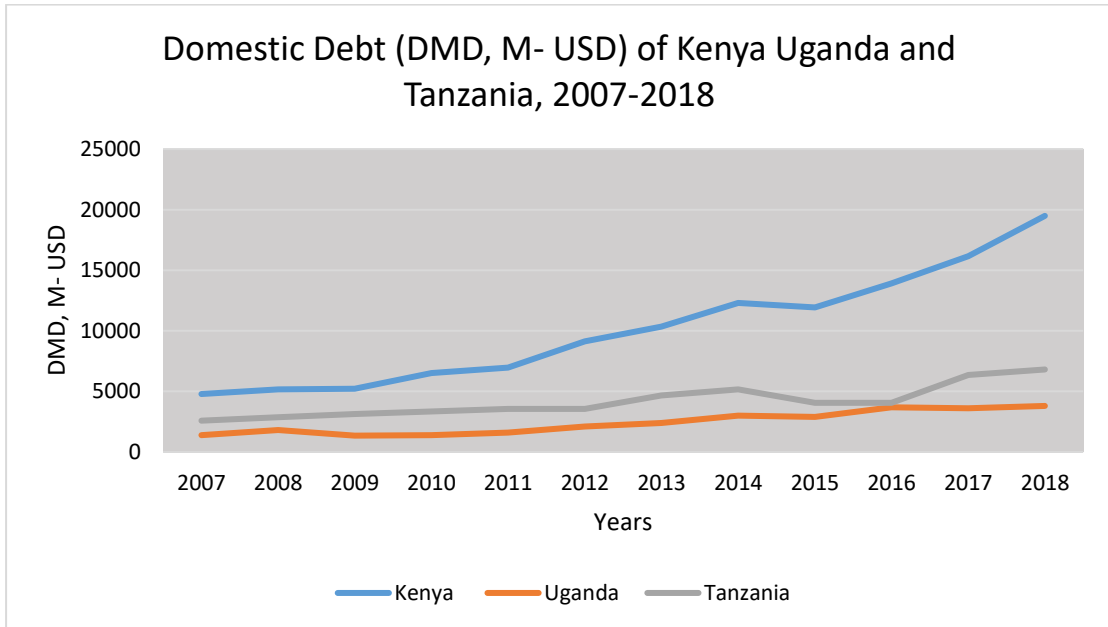
The graph shows Kenya’s manufactured exports to Uganda and Tanzania from 2007 to 2018. Uganda consistently imported more than Tanzania, with a peak in 2011 at over USD 850 million. However, exports to both countries declined steadily after 2012. Tanzania’s imports peaked in 2012 at around USD 550 million, followed by a sharp drop. The overall trend indicates a decline in Kenya’s manufactured exports to its key EAC partners, highlighting the need to address regional trade barriers and improve export competitiveness.



**Source:** Author’s computation based on MS Excel (2021)

The graph illustrates the capital expenditure (KXM) trends for Kenya, Uganda, and Tanzania between 2007 and 2018. Tanzania consistently recorded the highest capital spending, with a steady upward trend peaking near USD 3,800 million in 2018. Kenya exhibited fluctuating expenditure, with a sharp spike around 2014 nearing USD 4,000

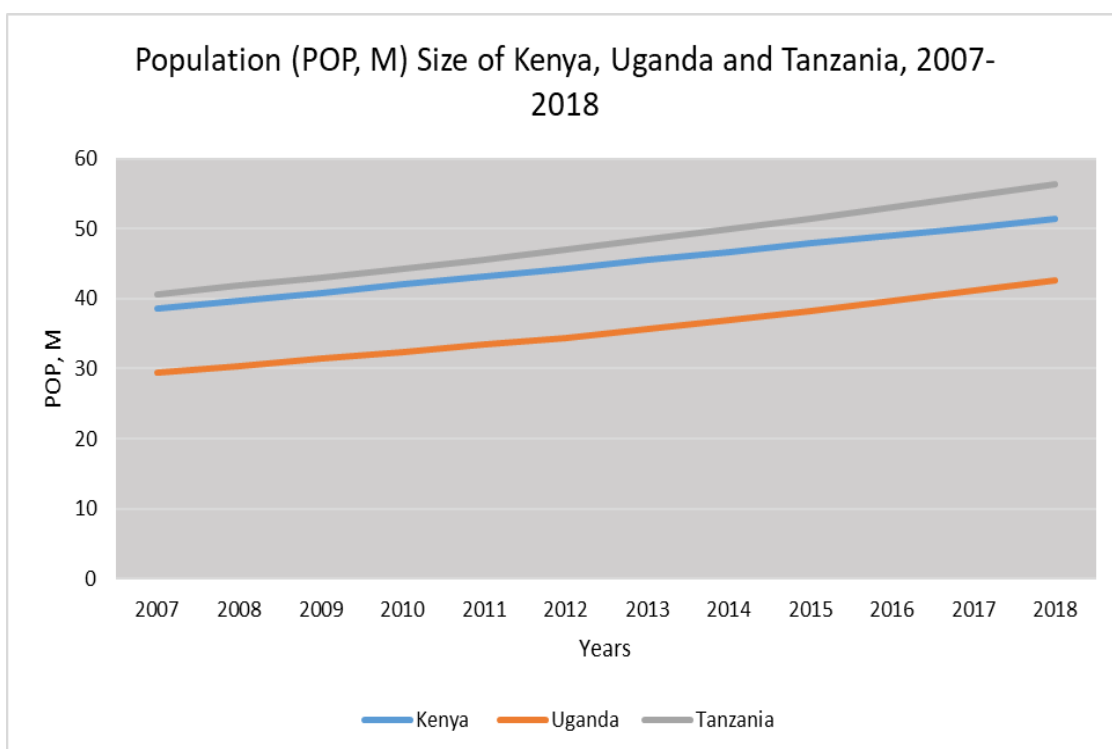
million before declining and stabilising. Uganda maintained the lowest but gradually rising capital expenditure over the years, increasing from around USD 1,000 million in 2007 to about USD 1,500 million in 2018. This trend reflects varying investment priorities and fiscal capacities among the three EAC countries.



**Source:** Author's computation based on MS Excel (2021)

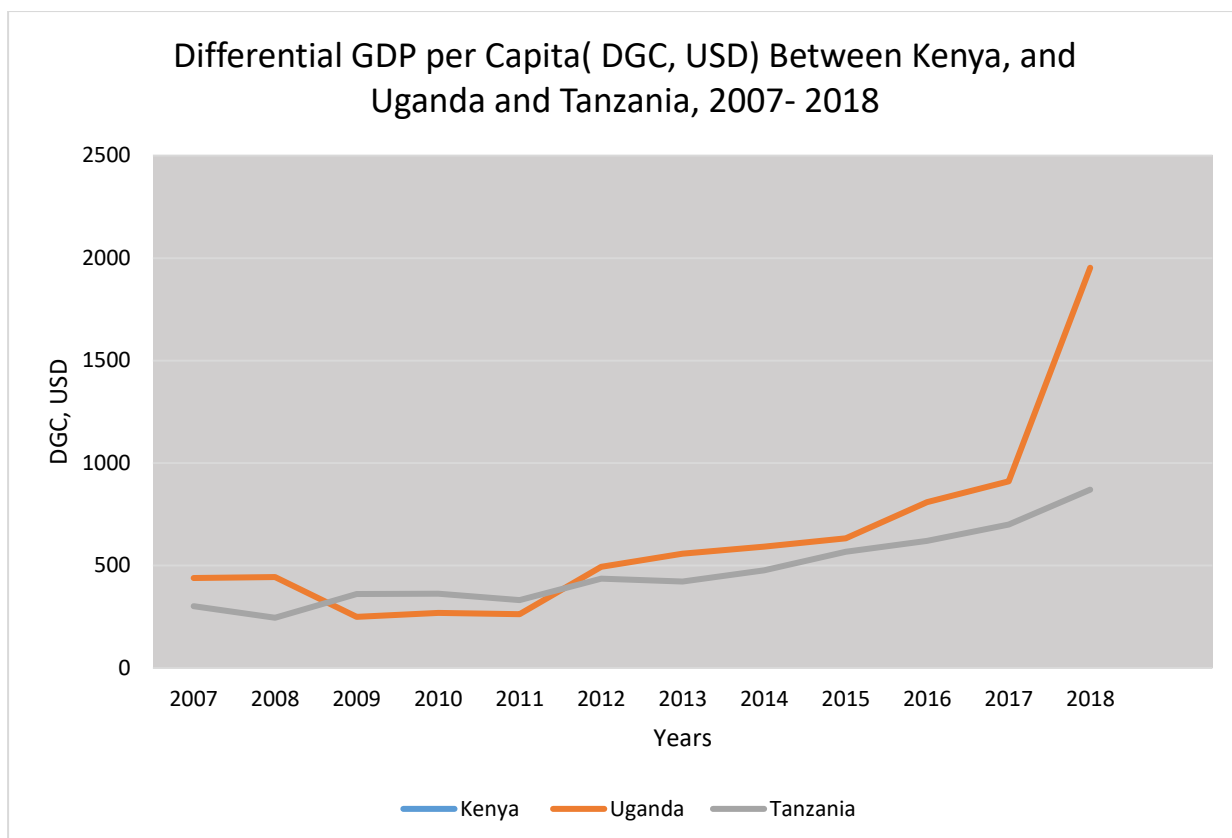
The graph presents the trends in domestic debt levels for Kenya, Uganda, and Tanzania between 2007 and 2018. Over this period, Kenya's domestic debt increased significantly, showing a steady and sharp upward trajectory. Starting at approximately 5,000 million USD in 2007, Kenya's domestic debt rose consistently, reaching nearly 23,000 million USD by 2018. This reflects an aggressive reliance on domestic borrowing to finance budgetary needs. In contrast, Tanzania's domestic debt remained relatively moderate, with a gradual increase from about 3,000 million USD in 2007 to just over 7,000 million USD in 2018. While the growth was not as sharp as Kenya's, there was a noticeable rise after 2016. Uganda recorded the lowest levels of domestic debt throughout the period, with a slow but steady increase from around 1,500 million

USD in 2007 to about 4,000 million USD in 2018. The trend suggests a more cautious approach to domestic borrowing compared to its regional counterparts.



**Source:** Author's computation based on MS Excel (2021)

The graph shows the population size of Kenya, Uganda, and Tanzania from 2007 to 2018, measured in millions. Over the period, all three countries experienced steady population growth. Tanzania consistently had the highest population, rising from about 41 million in 2007 to approximately 57 million in 2018. Kenya followed, increasing from around 38 million to 52 million, while Uganda had the lowest population but still grew significantly from roughly 29 million to 43 million.



**Source:** Author’s computation based on MS Excel (2021)

The chart displays the differential GDP per capita (DGC) between Kenya and its EAC trading partners, Uganda and Tanzania, between 2007 and 2018. Throughout this period, Uganda showed a sharper rise in income disparity, especially after 2016, culminating in a significant surge in 2018 to nearly USD 2,000. Tanzania also experienced a steady but more modest increase, reaching around USD 850 in 2018. These widening income gaps suggest growing differences in standards of living, which may influence trade patterns, consumer demand, and the applicability of the Linder hypothesis within regional trade dynamics.

#### 4.2.2 Correlation Analysis

**Table 4. 2: Correlation analysis**

Variables	(MXE)	(KXM)	(DMD)	(POP)	(GDP)	(DIS)	(CMC)	(CMB)	(DIS)
MXE	1.000								
KXM	-0.806*	1.000							
	(0.000)								
DMD	-0.709*	0.176	1.000						
	(0.000)	(0.305)							
(4) POP	-0.825*	0.337*	0.568*	1.000					
	(0.000)	(0.044)	(0.000)						
(5) GDP	-0.633*	0.209	0.947*	0.747*	1.000				
	(0.001)	(0.222)	(0.000)	(0.000)					
(6) DIS	-0.869*	0.808*	0.621*	0.781*	0.615*	1.000			
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)				
(7) CMC									
	(.)	(.)	(.)	(.)	(.)	(.)			
(8) CMB									
	(.)	(.)	(.)	(.)	(.)	(.)	(.)		
(9) DGC	-0.006	0.066	0.380	0.199	0.228	-0.230			1.000
	(0.977)	(0.760)	(0.067)	(0.350)	(0.284)	(0.279)	(.)	(.)	

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ , (.) denotes missing

**Source:** Author's Computation from Stata Version 17 (2024)

The correlation results presented in Table 4.2 reveal that MXE exhibits a robust, negative, and statistically significant relationship with KXM, evidenced by a correlation coefficient of -0.806 (p-value of 0.000, which is less than 0.05). Additionally, MXE demonstrates a strong, negative, and significant correlation with DMD, reflected in a correlation value of -0.709 (p-value of 0.000, also less than 0.05). Furthermore, there is a strong, negative, and significant association with population (POP), indicated by a correlation coefficient of -0.825 (p-value of 0.000, below 0.05). The relationship with GDP is similarly strong, negative, and significant, with a correlation value of -0.633 (p-value of 0.001, which is less than 0.05). Lastly, MXE shows a strong, negative, and significant correlation with DIS, as demonstrated by a correlation coefficient of -0.869 (p-value of 0.000, under 0.05).

KXM exhibited a moderate, positive, and significant correlation with POP, evidenced by a correlational value of 0.337 (p-value of 0.044 < 0.05). Additionally, it demonstrated a strong, positive, and significant correlation with DIS, as indicated by a correlational value of 0.808 (p-value of 0.000 < 0.05).

DMD exhibited a moderate, positive, and statistically significant correlation with POP, evidenced by a correlation coefficient of 0.568 (p-value of 0.000, which is less than 0.05). Furthermore, it demonstrated a strong, positive, and significant correlation with GDP, reflected in a correlation coefficient of 0.947 (p-value of 0.000, also less than 0.05). Lastly, there was a strong, positive, and significant correlation with GDP, indicated by a correlation coefficient of 0.621 (p-value of 0.001, which is less than 0.05).

POP exhibited a robust, affirmative, and statistically significant correlation with GDP, as evidenced by a correlation coefficient of 0.747 (p-value of 0.000 < 0.05); furthermore, it demonstrated a strong, positive, and significant relationship with DIS, reflected by a correlation coefficient of 0.781 (p-value of 0.000 < 0.05). Ultimately, DIS exhibited a robust, affirmative, and statistically significant relationship with GDP, as evidenced by a correlation coefficient of 0.615 (p-value of 0.001, which is less than 0.05).

#### **4.2.3 Panel Unit Root Tests**

Upon establishing the correlation and delineating the data, it becomes imperative to conduct a unit root test among the time-variant variables. These encompass produced exports, investment in capital, internal debt, demographic factors, and quality of life. The findings are delineated in Table 4.3. The Levin-Lin-Chu and Harris-Tzavalis tests were employed to examine the presence of a unit root.

**Table 4. 3: Unit Root Tests**

Variable	Levin-Lin-Chu			Haris-Tzavalis		
	t-statistic	p-value	Conclusion	t-statistic	p-value	Conclusion
<b>MXE</b>	-1.9887	0.025	<i>I(2)</i>	-4.6532	0.0000	<i>I(1)</i>
<b>KXM</b>	-4.1501	0.000	<i>I(1)</i>	-5.2421	0.0000	<i>I(0)</i>
<b>DMD</b>	-7.8487	0.000	<i>I(1)</i>	-5.1104	0.0000	<i>I(1)</i>
<b>POP</b>	-1.9871	0.026	<i>I(1)</i>	-8.5039	0.0000	<i>I(1)</i>
<b>GDP</b>	-4.8908	0.000	<i>I(1)</i>	-4.8908	0.0000	<i>I(1)</i>
<b>DIS</b>	-4.1804	0.0000	<i>I(1)</i>	-4.1804	0.0000	<i>I(1)</i>
<b>DGC</b>	-5.4224	0.0000	<i>I(2)</i>	-1.9792	0.0314	<i>I(1)</i>

**Notes:** *I*= Integration, *I(0)*= Integrated of Order Zero/levels, *I(1)*= Integrated of Order One, *I(2)*= Integrated of Order Two.

**Source:** Author's Computation from Stata Version 17 (2024)

The Levin-Lin-Chu test for unit root indicated that Kenya's Manufactured Export (KXM), Domestic Debt (DMD), Population (POP), Gross Domestic Product (GDP), and Distance (DIS) were *I(1)* with a p-value less than 0.05. Consequently, the null hypothesis of the unit root was rejected in favour of the alternative hypothesis asserting the absence of a unit root. The analysis of MXE and Differential GDP per Capita (DGC) yielded a result of *I(2)* (p-value <0.05), leading to the rejection of the null hypothesis regarding the presence of a unit root, thereby supporting the alternative hypothesis of its absence.

The Harris-Tzavalis test for unit root indicated that MXE, POP, DMD, GDP, DGC, and DIS were *I(1)* (p-value <0.05), leading to the rejection of the null hypothesis of the unit root in favour of the alternative hypothesis of no unit root. In conclusion, KXM exhibited a value of *I(0)* (p-value <0.05), thereby leading to the rejection of the null hypothesis concerning the unit root, in favour of the alternative hypothesis asserting the absence of a unit root.

### 4.3 Hausman Test

In accordance with equation 5, estimations were conducted for both random and fixed effect models. The Hausman test (Table 4.4) was employed to ascertain the most

suitable model, between random and fixed effects (Appendix VIII) for the gravity model. The random effect regression model (REM) has been selected.

**Table 4. 4: Hausman Test**

	---Coefficients---			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E
lnKXM	-0.059	-0.059	3.78e-13	1.53e-07
lnDMD	-0.089	-0.088	2.79e-13	
lnPOP	-1.079	-1.079	2.02e-12	4.01e-07
lnGDP	0.319	0.319	-9.77e-13	6.73e-08
chi <sup>2</sup> (4) = (b-B)'[(V_b-V_B) <sup>-1</sup> ](b-B) = 0.00				
Prob>chi <sup>2</sup> = 1.000				
(V_b-V_B is not positive definite)				

**Notes:**

*b = consistent under H<sub>0</sub> and H<sub>a</sub>; obtained from xtreg; B = inconsistent under H<sub>0</sub>, efficient under H<sub>a</sub>; obtained from xtreg; Test*

*H<sub>0</sub>: difference in coefficients (b-B) is not systematic (therefore random effect model is appropriate)*

**Source:** Author’s Computation from Stata Version 17 (2024)

The Hausman test posits the null hypothesis that H<sub>0</sub>: the variation in coefficients is not systematic, indicating that a random effect model is suitable. The findings from the Hausman test presented in Table 4.4 demonstrate that the probability associated with the chi-squared value was 1.000, exceeding the 0.05 threshold. Consequently, the null hypothesis concerning differences in coefficients could not be dismissed, leading to the conclusion that the random effects model was suitable for this investigation.

**4.4 Random Effect Model Regression, Discussions of the Findings and Test of Hypotheses**

Table 4.5 delineates the outcomes of the random regression analysis as ascertained through the Hausman test. The output presents the R-squared values along with the coefficients of the variables, including their associated p-values and t-values.

**Table 4. 5: Random Effect Regression Results**

Random-effects GLS regression				Number of obs.	=	24	
Group variable: Country_en~e				Number of groups	=	2	
R-sq				Obs per group:			
within = 0.283				min = 12			
between = 1.000				avg = 12.0			
overall = 0.783				max = 12			
corr(u_i, X) = 0 (assumed)				Wald chi <sup>2</sup> (1)	=	195.010	
				Prob > chi <sup>2</sup>	=	0.000	
lnMXE	Coef.	St.Err.	t-value	p-value	(95 per cent Confidence Interval)		Sig
lnKXM	0.588	0.150	3.920	0.000	0.292	0.883	***
lnDMD	-0.207	0.067	-3.080	0.002	-0.338	-0.075	***
lnPOP	0.208	0.063	3.302	0.001	3.299	0.851	***
lnGDP	0.588	0.151	3.894	0.000	0.293	0.884	***
lnDIS	-0.027	0.032	0.844	0.396	-0.036	0.090	*
CMC	0.068	0.023	2.957	0.003	0.023	0.113	***
CMB	-0.029	0.045	-0.644	0.513	-0.118	0.059	*
Constant	13.515	1.275	10.600	0.000	11.017	16.013	***
Sigma_e	0.164						
Sigma_u	0.462						
rho	0.888	(fraction of variance due to u_i)					

**Source:** Author's Computation from Stata Version 17 (2024)

The significance of the F-Test probability (Prob F-statistic  $0.000 < 0.05$ ) indicates that all coefficients in the model are collectively distinct from zero, thereby affirming the model's adequacy. The independent variables (KXM, DMD, and POP) collectively account for the variations observed in the dependent variable (MXE). The overall R-squared value stands at 0.783, indicating that the independent variables account for 78.3 per cent of the variations observed in the dependent variable. The remaining 21.7 per cent is attributed to other factors not encompassed within the scope of this study, *ceteris paribus*.

Rho, or intra-class correlation, elucidates the extent to which variations in the dependent variable (MXE) can be attributed to disparities among countries. The disparities may encompass differences in national industrial or trade policies among the

three EAC nations. The rho value of 0.888 indicates that 88.8 per cent of the variation in output can be attributed to the differences among the countries.

#### **4.4.1 Objective One: Capital Expenditure (KXM) and Manufactured Exports (MXE)**

The primary aim of the study was to assess the impact of capital expenditure on Kenya's manufactured exports to Uganda and Tanzania. The findings from the random effect regression model revealed that capital expenditure exhibited a positive and statistically significant coefficient of 0.588 ( $p\text{-value } 0.000 < 0.05$ ). This suggests that a 1 per cent rise in capital expenditure results in a 0.588 per cent increase in Kenya's manufactured exports, assuming all other variables remain unchanged.

The significant and positive relationship between the capital investment and the manufactured exports can be attributed to the fact that infrastructure reduces the cost of production, access to modern technology as well as increased economic returns on labour. Infrastructure also improves the standard of living through the provision of amenities, distribution of consumables goods and provision of macro economic stability. With the lower production costs, the manufacturing companies will produce more goods at a lower cost, hence exporting at low prices, thereby improving the quantity of exports. This result supported the theoretical expectation of positive relationship between capital expenditure and manufactured exports.

The outcome of capital spending supports other studies by Falade and Oladiran (2015) who found a positive short-term relationship between the output of manufacture and government capital expenditure in Nigeria. Ekpo (1995) found out that capital spending on transport and communication positively influences the investment in privates in Nigeria, which, in its turn, leads to the increase in the overall economy. Moreover, Onakoya and Somoye (2013) examined the role of public capital expenditure in

economic growth as it applies to the situation of Nigeria. Also, Eze and Ogiji (2013) investigated the effect of fiscal policy on the production of the manufacturing industry in Nigeria. According to the findings, government expenditure is significantly influencing the production in the manufacturing industry and their fiscal policy and the production of the manufacturing industry exhibits a long-term relationship in Nigeria.

Lastly, Onakoya, Tella, and Osoba (2012) investigate the connection between Nigeria's economic growth and investments in telecommunications infrastructure. The results of the study showed that investments in telecommunications infrastructure had a major impact on the economy's output, both directly through industrial production and indirectly through the performance of many industries, such as manufacturing, oil, agriculture, and other services.

However, this study is a deviation of the studies that have been conducted previously by Samson (2013), who conducted a review of the relation between government spending and economic growth in the industrial sector in Nigeria. It was suggested by the research that there is a significant negative relationship between the industrial sector of the economy and government expenditure. The results suggest that there is need to strategically invest the state funds in productive sectors in Nigeria. In addition, Nurudeen and Usman (2010) noted that the growing aggregate government capital spending did not lead to a meaningful development in Nigeria.

Finally, the study by Nurudeen and Usman (2010) and that by Samson (2013) sheds light on why the capital expenditure coefficient was registered at 0.588 and not at a larger number. The issue of corruption in governmental capital projects results in a rise in the project costs, the surplus of which is drained out into personal coffers.

Therefore, even at the perceived high cost, projects can, in reality, have a lesser value and thus distort the expected relationship with public good. In addition, the study shows that there is a need to channel financial resources to productive areas. The findings of Onakoya and Somoye (2013) support this statement as they indicate that some of the traditional sectors can experience reduced returns on investment. As a result, a strong motivation emerges to invest in innovative areas, including telecommunications, which have increasing returns to scale, as it is argued by Ekpo (1995) and further reinforced by Onakoya, Tella and Osoba (2012).

In turn, the results falsify the first null hypothesis, which means that capital spending does in fact have an effect on the manufactured exports of Kenya to Uganda and Tanzania.

#### **4.4.2 Objective Two: Domestic Debt (DMD) and Manufactured Exports (MXE)**

The second objective of the study was to examine the impact of domestic debt on Kenya's manufactured exports to Uganda and Tanzania. The findings from the random effect regression model revealed that domestic debt exhibited a negative and statistically significant coefficient of 0.207 ( $p\text{-value } 0.002 < 0.05$ ). This suggests that an increase of 1 per cent in domestic debt results in a decrease of 0.207 per cent in Kenya's manufactured exports to Uganda and Tanzania, all else being equal.

The negative and significant correlation observed between the domestic debt and manufactured exports can be attributed to the observed phenomenon in which domestic debt financing replaces the private investment. In the exercise of domestic borrowing, governments utilise domestic private savings which would have otherwise been available to the private sector. The net effect of this is twofold: on the one hand, lenders are inclined to supply credit exclusively to governments and not to the private sector.

In most cases Lenders show preference by increasing the interest rates charged to the domestic credit to the private sector as compared to the public sector, which affects access of the private investment to capital adversely.

In addition, in situations where the interest rates are controlled, the domestic borrowing can lead to credit rationing and displacement of investment in the private sector. On the other hand, when the debt is used in development expenditure, it can reduce the production costs thus raising the industrial production and manufactured exports. This finding is in line with the theoretical predictability of what can be referred to as a possible positive or negative relationship between domestic debt and manufactured exports.

The presence of corruption is another fact to be considered because it has an indirect impact on the manufactured exports. According to Hope (2014), seventy-five per cent of the companies in Kenya reported the need to pay informal or illegal payments in order to operate (Iarossi, 2009). It has been estimated that corruption is costing Kenyan firms a substantial amount of 4 per cent of their annual sales, which is considered very high in the international standard (Iarossi, 2009). In addition, it has been noted that Kenyan firms are being further burdened with 12 per cent value of the public contract because of the informal or illegal payments (Iarossi, 2009).

In addition, it is interesting to note that the act of bribing tax inspectors is common in Kenya whereby about one-third of the sampled companies reveal that tax inspectors have requested informal or illegal payments. Similarly, there are also demands of informal or illegal payments related to licensing and utility connections (Iarossi, 2009). In sharp contrast, a significant 71 per cent of firms reported giving gifts (effectually illegal contributions) in order to get government contracts, compared with 38 per cent in sub-Saharan Africa and 28 per cent globally (Ingram et al. 2007).

The situation where police and other officials seek payments on the trucks in transit is seen as a unique attribute of Kenya.

The widespread use of bribes that the private sector is forced to pay in order to get government contracts and services logically forces them to protect their gains by increasing project costs, a failure which in the ultimate situation leads to poor quality of work delivered. Given that Kenya budgetary allocation on the capital expenditure is solely dependent on debt financing, there is likelihood that either the projects will fail to inflate above 12 per cent or they will be poorly implemented though public debt is in support.

The Public Finance Management Act (PFM) Act, 2012, Section 12 (2) (c) states one of the fiscal responsibility principles:

*“Over the medium term, the national government’s borrowings shall be used only for the purpose of financing development expenditure and not for recurrent expenditure.”*

Evidence from the Kenya National Bureau of Statistics (KNBS) suggests a different conclusion. The KNBS Statistical Abstracts from the Financial Year 2011/12 to 2017/18 reveal a persistent infringement of this principle and law, as demonstrated in Appendix IV. The public debt accumulated to support non-capital expenditure experienced a consistent increase from Kshs. negative 14.8 billion to Kshs. 215.1 Billion.

This infraction indicates that public debt is allocated not solely to capital investment within the economy, but also to recurrent expenditures and the servicing of public debt. As a result, the presumption that domestic debt is allocated to capital investment is refuted, thereby skewing the anticipated impact of domestic debt on the dependent variable.

The anticipated outputs of debt-based initiatives are further undermined, which

explains why the outcomes of the government development projects are negative, based on the claims made by Nurudeen and Usman (2010), Samson (2013), and Hope (2014) as regards the widespread corruption in the government-funded projects.

The findings on domestic debt are in line with previous studies carried out by Abbas and Christensen (2010) that revealed that high levels of debt would relate to a drop in economic growth. The study has found out that moderate amounts of domestic debt, in terms of percentage of GDP have significant positive effects on economic growth. However, over 35 per cent of total bank deposits as debt hinder economic development. Adofu and Abula (2010) explored how domestic debt affected the Nigerian economy between the years 1986 and 2005 and found out that the Nigerian domestic debt adversely influenced the growth of the economy. They recommended that the government ought to take action in order to deal with the prevailing domestic debt. Finally, the report of the World Bank and the IMF (2001) demonstrates that the universal use of domestic borrowing can contribute to the serious negative impact on the economy. The analysis revealed that servicing of domestic debt can consume significant amount of government revenues, especially since domestic and foreign interest rates are high.

Cost of domestic borrowing can quickly rise together with the increase in the outstanding debt stock, especially in the less advanced financial market. The rise in interest rates might turn out to be much more pronounced in the event that the pool of investors is relatively small, since the government might be restricted by the needs of a particular group of investors.

However, this work offers an alternative to the previous findings made by Maana et al. (2008), who examined the impact of domestic debt on the economy of Kenya in the period of study 1996 to 2007. The study revealed that growth of domestic debt had a

positive but statistically negligible impact on growth during the periods under discussion. However, the study did not show any sign that the growth of domestic debt discourages lending in Kenya by the private sector.

In their study of the role of domestic debt in economic development in Kenya between the year 2000 and 2010, Putunoi and Mutuku (2013) have revealed that domestic debt markets are increasingly becoming instrumental in promoting economic development. Their study revealed that the growth in domestic debt had a long-term effect on the economic growth which was positive and significant in nature. Moreover, Sheikh et al. (2010) investigated the role of domestic debt on the economic development of Pakistan between the period 1972 and 2009 and discovered that domestic debt is a positive factor affecting economic growth in the country.

The null hypothesis was therefore rejected in the research which means that the domestic debt does affect the manufactured exports made by Kenya to Uganda and Tanzania.

#### **4.4.3 Objective Three: Population size (POP) and Manufactured Exports (MXE)**

The third objective of the study was to ascertain the influence of population size on Kenya's manufactured exports to Uganda and Tanzania. The findings from the random effect regression model revealed that population size exhibited a positive and statistically significant coefficient of 0.208 ( $p\text{-value } 0.000 < 0.05$ ). This suggests that a 1 per cent rise in population size results in a 0.208 per cent increase in Kenya's manufactured exports. The notable and affirmative correlation between population size and manufactured exports can be ascribed to the notion that a larger population endows a nation with economies of scale, thereby conferring a comparative advantage in the realm of manufactured goods. Moreover, regions with high population density tend to

benefit manufactured industries by reducing communication and distribution expenses, thereby enhancing the competitiveness of their products in terms of pricing.

This result was in support of the theoretical expectation of positive relationality between population size and manufactured exports. These findings resonate with the previous studies that have been done by Nuroglu (2010) which focused on bilateral trade flows and the determinants of bilateral trade flows across six leading OIC (Organisation of the Islamic Conference) economies. The research indicated that the effect of population size on bilateral trade flows brings about a positive impact to the exporting country, but it brings a negative impact to the importing country.

The explanation by Zhou (2019) of why it was noted by Rostow that a leading sector played an important role in the industrialisation process was based on a general equilibrium model. The study has found that population growth poses a complicated problem as it may provide a greater labor force and increase the market of produced products, but may also create possible difficulties to the agricultural industry. In the analysis of Chinese and British situations before the Industrial Revolution, one can note that research and development was critical in promoting the sustained growth of industry. The results suggest that to achieve independent industrialisation requires convergence of a sufficient market population fuelled by demand and a strong supply of technologies on the supply side.

Moreover, Banerji (1972) has provided empirical evidence in terms of cross-country studies that prove the hypothesis of the positive relationship between the population size and population density and performance of manufactured exports in India.

Lastly, Karimi et al. (2018) examined how the population ageing affects the trade of the industrial products between Iran and the major trade partners between the years

2000 and 2015. The paper has found out that, given the differences in demographics among different countries act as basis of comparative advantage in the context of international trade. The industries that rely on competencies in which the young employees are more efficient will experience increased productivity where the country is characterised by a youthful workforce and reduced productivity in countries with an ageing population. The results showed that human capital among more aged age groups that possess improved job skills leads to a comparative advantage and enhances the export levels of countries.

As a result, the null hypothesis was rejected and this implies that population size does affect manufactured exports of Kenya to Uganda and Tanzania.

#### **4.4.4 Dummy Variables**

The initial dummy variable CMC (Common Colony) exhibited a coefficient of 0.068 and demonstrated a significant influence on Kenya's manufactured exports (p-value  $0.003 < 0.05$ ), suggesting that a shared colonial history fosters export activities to Uganda and Tanzania. Countries subjected to colonisation by a dominant power established analogous political, social, economic, and cultural connections that continue to bind them in the present day. In the context of ASEAN, social and cultural factors, including the presence of a common language, seem to have played a significant role in selecting countries for relocation.

Weerahewa (2009) noted that a common language has significant and positive impact on the value of agricultural goods, vegetable products, processed food products and manufactured goods in terms of exports. Our research shows that countries that share the identical official language are more likely to export 6.12 to 12.6 per cent than countries with different official languages. This is specially written to export the

vegetables, prepared food, and manufactured products. This is in line with the theoretical expectations made.

The second dummy variable was CMB (Common Border) with a coefficient of -0.029 and insignificant (p-value  $0.513 > 0.05$ ), indicating that CMB is a deterrent to Kenya exports to Uganda and Tanzania. The countries are expected to prosper in trade due to the fact that they share a common border, but the results of the research did not match the expectation. The finding can be explained by three factors. The first one is concerned with the harmful impact of Non-Tariff Barriers (NTB) in the context of global trade, the problem of illicit trade, and the third is the expectations of Linder Hypothesis of international trade.

#### **4.4.4.1 Non-Tariff Barriers**

Non-Tariff Barriers are constraints resulting from laws, regulations, or specific market requirements that make it more difficult or expensive to import or export commodities, according to the COMESA-EAC-SADC NTB online reporting mechanism. The unwarranted and/or inappropriate application of Non-Tariff Measures (NTMs), such as sanitary and phytosanitary (SPS) measures and other technical barriers to trade (TBT), is referred to as a non-tariff barrier (NTB).

Non-tariff barriers result from a variety of measures taken by governments and authorities to protect home industries from foreign competition. These measures include laws, rules, policies, conditions, restrictions, or particular requirements, as well as private sector practices or prohibitions. In the context of international trade, nations usually decide to use Non-Tariff Barriers (NTBs) rather than traditional tariffs.

Government involvement in trade, government-endorsed restrictive policies, administrative and customs entry procedures, technological trade barriers, and sanitary and phytosanitary measures are the metrics that the NTB measures. Some restrictions, import taxes, various process difficulties, transportation, customs clearance, and forwarding are additional factors.

According to Article 75(5) of the Treaty, the EAC Partner States have committed to eliminating all non-tariff obstacles that currently prevent other Partner States from imposing their own restrictions on the importation of products into their territories.

The Trade Mark Africa site reports that since 2004 to on June 2022, the EAC recorded 256 non-tariff barriers (NTBs) and managed to have 234 of them resolved, hence a 91.4 per cent. resolution rate. The stunning figure of the NTBs was 22. On 12th October 2015 under NTB Complaint No. NTB-000-681, Kenya had claimed that the Republic of Uganda had levied a 10 per cent duty on laundry bar soaps produced in Kenya in a manner considered discriminative. This issue was resolved in 262 days and settled on the 30th of June, 2016.

Prior to the launch of the NTB, Kenya used to ship over 1.6 million kilograms of soap to Uganda, which is worth about USD 941,000. But after the introduction of the NTB, the trade dropped down to approximately 86,000 kilograms and its worth was more than USD 100,000. This shows that there is a major loss of trade and business has lost more than USD 800,000 in revenues. Quantity gradually increased after the resolution of the NTB in 2016 and was 147,955 kg in 2017 and 2.3 M kg in 2021. The statistics show that the exports of bar soaps in Kenya to Uganda have increased at a rate of 2.2 million kilograms in 2021 due to the resolution of the NTB with a financial implication of USD 1.5 million.

Kenya and Tanzania are in a diplomatic disagreement, which was reported by AFP in 2018 and caused the international flights between the two countries to be suspended. According to the EAC, the total trade across the Partner States of the EAC grew significantly by 19.2 per cent in 2017 (EAC, Trade and Investment Report 2018). In 2018, the growth showed a decrease to 13.9 per cent and this means that there were some underlying activities.

WTO (2018) noted that intra-EAC trade is significantly lower as compared to trade in other Regional Economic Communities (RECs). Reduced ratio can be largely blamed on the trade barriers, such as inefficient infrastructure and bureaucratic administrative procedures. It is quite disappointing to observe that nearly 87 per cent of commerce carried out by EAC Partner States is with countries outside EAC, especially China, India, and EU. The non-tariff barriers average tariff equivalent is equivalent to 40 per cent. The tariff charged on most of the trade commodities is by far higher than the Most Favoured Nation (MFN) tariff commonly charged by different countries. This is a clear indication that the non-tariff barriers significantly increase the cost of businesses acquiring intermediate inputs in the affected region as well as the cost to the consumer in the regional market (Carrere and Melo, 2009).

One observation that was interesting was the role of the bribery factor in EAC trade as a non-tariff barrier. Richardson (2004) noted that although there is a need to expand thriving businesses, the African continent experiences serious hurdles in realizing company success. Such issues as ineffective roads, unreasonable road blocks, non official toll collection stations, and corrupt police officers and road officials are some of the challenges that have made it a confusing puzzle as far as the transportation of goods to different parts of the continent is concerned. Varhaeghe & Mathieson (2017)

revealed that the weightbids in East African Community add between 0.16 per cent and 0.86 per cent to the price of the product. Moreover, border delays increase costs by 0.49 per cent to 2.51 per cent and other delays including traffic and roadblocks have the potential to increase transport and trade expenses by a margin of 1.17 per cent to 6.05 per cent.

Finally, it can be mentioned that bribes are widespread in the trade routes of the EAC, and the possible range includes traffic fines that are not officially stated and border facilitation strategies. The average cost of the bribes paid by each truck is USD 35 per trip, and it increases the expenses of the cross-border trade by about 0.16 per cent through 0.81 per cent. It was shown in the research that the effect of withdrawal of non-tariff barriers may potentially increase the volume of trade in the East African Community by a maximum of 13 per cent, and boost the GDP growth and consumers welfare by about 0.5 per cent and 0.3 and 0.4 per cent respectively. In addition, the mean consumer goods prices as well as the prices of the traded goods can decline by approximately 2.8 per cent.

#### **4.4.4.2 Illicit Trade**

The Anti-Counterfeit Authority (2020) further states that Kenya has lost Ksh 102.99 billion in the year 2018 as compared to Ksh 101.23 billion in fiscal revenue in 2017. The research concentrated on 16 sectors in the economy where building, mining and construction were considerably affected by counterfeiting since they constituted 23.37 per cent of the total value of illicit trade. This was joined by the energy, electrical and electronics sectors that constituted 14.67 per cent in 2018. Food, beverage, and non-alcoholic drinks took the lead in the sector with the highest loss in government revenue of 23.19 per cent, with textile and apparel coming right after with 20.09 per cent.

According to Maroa (2013), Kenya is the biggest marketplace of counterfeit product and contraband in the East African region.

As explained by Gikonyo (2009), the fiscal and trade policy difference in the price of the same products is a powerful trigger of illicit trade across borders and this leads to massive and probably unprecedented illicit trade between Kenya and Uganda. This is in the form of smuggling, under-declaration and false declaration.

#### **4.4.4.3 Linder's Hypothesis**

Ultimately, this study concludes that Linder's Effect adversely impacts trade relations in manufactured goods between Kenya and its two partners, attributable to the significant disparity in living standards between Kenya, on one hand, and both Uganda and Tanzania, on the other.

#### **4.4.5 Gravity Model**

The research results aligned with the gravity model of international trade, indicating that Kenya's exports are notably higher to nations with greater economic size compared to those with similar or lower gross domestic product levels (GDP coefficient of 0.588 and p-value of 0.000) as presented in Table 4.5.

The distance factor poses a constraint, but its effect on the amount of international trade is relatively small and negligible, as shown with the DIS coefficient of -0.027 and a p-value of 0.036 in Table 4.5. This is in line with the findings made by Chaney (2008) who stated that although the influence of size, which is normally measured by GDP, is generally well understood, the influence of distance remains an unexplained concept.

According to Helpman (1987), distance can be used to not only estimate the cost of transport but also the cost of making transactions: it can also be linked with the cost of exploring trading opportunities and the cost of developing trust between potential

trading partners. Moreover, it can replace the cost related to culture since cultural differences can hinder the trade in different ways, such as the inability to communicate and negotiation strategies clashing with one another. On the other hand, the mutual benefits of the common business language, negotiating patterns, and legal systems can be achieved by trade partners who have a common colonial background.

Borchert and Yotov (2017) performed the analysis of the impact of globalization on manufacturing trade during the period 1986-2006, and it was identified that, on the average, the importance of distance is decreased due to the progress in the technology and dispersion of the production process. The study further found out that those countries which were in the mid range of the per-capita income distribution suffered the greatest loss in distance coefficients. At the same time, the barriers imposed by trade friction still remain a serious problem to most countries with low incomes, which may invalidate their attempts to enter into global markets.

Freund et al. (2004) showed that an increase in the growth of web hosts in a country by 10-percentage points would translate to about 0.2 percentage points in the growth of exports. The study attributed this trend to the improvement in technology that has reduced marketing and entry cost.

Sanders (2000) estimated the world cross-border e-commerce transactions to be at 44 billion dollar and expected to grow to 1.4 trillion by 2004, which constituted 18 per cent of overall exports.

#### **4.4.6 The Moderating Effect of Standard of Living (DGC) on the Association between Macro-Economic Variables and Kenya's Manufactured Exports (MXE) to Uganda and Tanzania**

Dharma (2018) posits that a moderating variable influences the relationship between the explanatory and dependent variables. Comprehending the influence of the moderating variable enabled the researcher to ascertain the true extent of the relationship between the independent variables (capital expenditure, domestic debt, and population size) and the dependent variable (manufactured exports).

The research employed the standard of living as the moderating variable. The analysis employed Differential GDP per Capita (DGC) as a metric for assessing income similarity, serving as an indicator of standard of living, while variations in  $R^2$  values were utilized to evaluate the impact of the moderating variable. Table 4.6 delineates the results of random regression as established by the Hausman test. The analysis presents the R-squared values along with the coefficients of the variables, accompanied by their respective p-values and t-values.

**Table 4. 6: Random Effect Regression Output with DGC as a Moderating Variable**

Random-effects GLS regression					Number of obs =	24	
Group variable: Country_en~e					Number of groups=	2	
R-sq:					Obs per group:		
within = 0.300					min = 12		
between = 1.000					avg = 12.0		
overall = 0.798					max = 12		
corr(u <sub>i</sub> , X) = 0 (assumed)					Wald chi <sup>2</sup> (1) =	59.420	
					Prob > chi <sup>2</sup> =	0.000	
lnMXE	Coef.	St.Err.	t-value	p-value	(95 per cent Confidence Interval)		Significance
lnKXM	-0.022	0.052	-0.410	0.679	-0.124	0.081	
lnDMD	-0.062	0.031	-1.990	0.047	-0.123	-0.001	**
lnPOP	-0.901	0.805	-1.120	0.263	-2.480	0.677	
lnGDP	0.001	0.000	6.500	0.000	0.001	0.002	**
							*
lnDIS	-0.836	0.545	-1.530	0.125	-1.904	0.233	
lnDGC	-0.267	0.033	-8.100	0.000	-0.333	-0.202	**
							*
CMC	0.029	0.012	2.430	0.015	0.006	0.053	**
CMB	-0.042	0.032	-1.321	0.186	-0.105	0.020	
Constant	15.859	1.854	8.55	0.000	12.226	19.493	**
							*
Sigma_u	0						
Sigma_e	0.0793						
Rho	0						

**Source:** Author's Computation from Stata Version 17 (2024)

The significance of the F-test is evident (Prob F-statistic  $0.000 < 0.05$ ), indicating that all coefficients in the model are collectively distinct from zero. This suggests that the model is appropriate, as the independent variables (KXM, DMD, POP, and DGC) together account for the variations in the dependent variable (MXE). The overall R-squared is 0.798, indicating that the independent variables account for 79.8 per cent of the variations in the dependent variable. In comparison, the remaining 20.2 per cent is attributed to other factors not encompassed by this study. The intra-class correlation, denoted as Rho, elucidates the extent to which variations in the dependent variable (MXE) can be attributed to disparities among countries. The

disparities may encompass differences in national industrial or trade policies among the three EAC nations. The rho value of 0.888 indicates that 88.8 per cent of the variation in output can be attributed to the differences among the countries.

#### **4.4.6.1 Discussion of the Moderating Effect of Standard of Living (DGC)**

The fourth objective of the study was to investigate the moderating influence of the standard of living (DGC) on Kenya's manufactured exports to Uganda and Tanzania. According to Table 4.6, the coefficient associated with the standard of living variable, DGC, which quantifies income similarity, is -0.267, accompanied by a p-value of 0.000, indicating a statistically significant outcome.

The coefficient for DGC of -0.267 indicates that a one per cent increase in DGC will result in a 0.267 per cent decrease in Kenya's manufactured exports to Uganda and Tanzania, assuming all other factors remain constant. Consequently, the research rejected the fourth null hypothesis, indicating that the standard of living, as measured by differential GDP per capita, does indeed influence Kenya's manufactured exports to Uganda and Tanzania.

In the absence of per capita income as a moderating variable, the overall R-squared ( $R^2$ ) stands at 0.783. However, upon incorporating DGC, which serves as a proxy for standard of living, into the model as a moderating variable, the overall  $R^2$  rises to 0.798. This indicates that the influence of the standard of living has led to capital expenditure, domestic debt, and population size collectively accounting for a 79.8 per cent variation in manufactured exports, an increase from the previous 78.3 per cent. The moderating variable consequently enhances the relationship by 1.50 per cent.

#### **4.4.7 Testing Linder's Hypothesis**

The existence of Linder's effect in Kenya's trade with its two EAC partners regarding the export of manufactured goods is demonstrated by the differential GDP per capita (DGC) of -0.267, accompanied by a p-value of 0.000, which indicates statistical significance.

This outcome corroborated the theoretical anticipation of a favourable correlation between the differential GDP per capita and manufactured exports.

The negative sign supports the hypothesis of Linder, according to which the gaps in inequality of income levels, namely, an upward shift in Differentiate GDP per Capita (DGC), will cause the loss of trade in the manufactured goods (Appendix V). A review of World Bank statistics on per capita GDP (Appendix V) indicates that the income per capita in Kenya has a wide gap in comparison to Uganda and Tanzania with the average GDP per Capita of Kenya, Uganda and Tanzania standing at 3204, 2097 and 2181 between 2007 and 2018.

This research showed that the hypothesis made by Linder is supported. This can be explained through the fact that, when the quality of life in two countries trading with each other is moderate, which is characterised by a small gap in the GDP per-capita, the two countries tend to have parallel developmental needs. As a result, they make similar capital investments that promote the manufacturing of products which though differentiated, satisfy the common tastes of their citizens resulting in the exportation of surplus products. In addition, they have similar expenditure patterns and generate similar amounts of fiscal revenue to finance the expenditures leading to similar deficits and deficit financing models.

Conversely, where the quality of life in two trading countries is characterised by a high degree of disparity, i.e. a large gap in GDP/capita, the two countries tend to have divergent developmental needs. This results in a differentiation in capital investments which encourage the production of differentiated goods since the populations have different preferences hence the potential to trade is minimal between the countries. Moreover, they have different spending behavior and priorities, this translates to different levels of fiscal revenue to finance these expenditures and hence different deficits and models of financing deficits.

The findings of the standard of living also support previous studies by Ellis (1983) who has shown the Linder effect in the exchange of international manufactured goods by undertaking a correlation analysis of indices of trade intensity and indices of income variation of the measured variables. Moreover, Thursby and Thursby (1986) supported the hypothesis of Linder by examining a sample of 17 countries between 1974 and 1982, and the claim that the increase in trade variability also reduces cross-border trade flows. More recently, Chow et al. (1999) have undertaken an analysis of the trade patterns between the 'Four Tigers of East Asia, and their main OECD markets. A large disaggregated data set was used, that is, it was all manufactured exports of the East Asian NICs to different OECD markets, in the period of 1965 to 1990. The results of their findings supported Linder thesis. Lastly, the McPherson et al. (2001) findings also supported the Linder hypothesis on five out of six of the developing nations in East Africa. It was noted that such nations trade much more with other countries that are having similar per capita income levels as they had predicted by Linder.

Nonetheless, this research stands in opposition to previous conclusions drawn by Kennedy and McHugh (1980), who examined the theory by analysing variations in

trading propensities relative to shifts in income disparities across two distinct timeframes, thereby mitigating the impact of distance. Their findings employing this approach did not corroborate the Linder hypothesis. The findings of Qureshi *et al.* (1980) similarly did not lend support to Linder’s Hypothesis. Ultimately, Hoftyzer (1984) offered a critique of Linder’s methodology and employed a different testing approach. He discovered that geographic distance and participation in free trade areas significantly influence trade patterns; however, the empirical support for the Linder thesis was lacking.

Consequently, the findings refuted the fourth null hypothesis, indicating that the standard of living does indeed influence Kenya’s manufactured exports to Uganda and Tanzania.

#### 4.5 Post-Estimation Diagnostic Tests

The diagnostic assessments performed encompassed evaluations for multicollinearity, autocorrelation, and heteroscedasticity. The examinations were conducted to ascertain that the principles of classical linear regression remained intact and unbreached.

##### 4.5.1 Test for Multicollinearity

**Table 4. 7: VIF test for Multicollinearity**

Variable	VIF	1/VIF
lnPOP	14.12	0.071
lnKXM	8.32	0.120
lnGDP	5.64	0.177
lnDMD	4.28	0.233
lnDIS	4.10	0.244
<b>Mean VIF</b>	<b>7.29</b>	

**Source:** Author’s Computation from Stata Version 17 (2024)

Table 4.7 delineates the findings of the multicollinearity assessment concerning the variables. The mean VIF value of 7.29 is below the threshold of 10, leading to the

conclusion that multicollinearity is absent. In other words, the independent variables exhibit no intercorrelation.

#### 4.5.2 Wooldridge Test for Autocorrelation

To determine the presence of autocorrelation, the Wooldridge test was employed to examine the presence of first-order serial correlation in the idiosyncratic error term, with the results and their interpretation detailed in Table 4.8. This examination evaluates the null hypothesis positing the absence of first-order serial correlation within idiosyncratic error terms, while presuming that these errors remain uncorrelated.

**Table 4. 8: Test for serial autocorrelation**

Variable	HR-stat	p-value	Accept Null Hypothesis	Interpretation
lnMXE	1.01	0.167	Yes	No evidence of first-order serial correlation
lnKXM	-1.41	0.158	Yes	No evidence of first-order serial correlation
lnDMD	0.88	0.376	Yes	No evidence of first-order serial correlation
lnPOP	0.667	0.504	Yes	No evidence of first-order serial correlation
lnGDP	0.981	0.326	Yes	No evidence of first-order serial correlation
lnDIS	-0.03	0.974	Yes	No evidence of first-order serial correlation

**Source:** Author's Computation from Stata Version 17 (2024)

The data presented in Table 4.8 indicates that the p-values for all variables exceed 0.05, leading to the conclusion that the null hypothesis of no serial correlation cannot be rejected. Consequently, it is inferred that there exists no serial correlation among the error terms.

### 4.5.3 Cook-Weisberg/Breusch-Pagan Test for Heteroscedasticity

The Cook-Weisberg test for heteroscedasticity evaluates the null hypothesis that the variance of residuals remains constant across all observations, juxtaposed with the alternative hypothesis that this variance is not constant across the observations.

**Table 4. 9: Breusch-Pagan / Cook-Weisberg Test Results**

Chi-square	P-value
0.79	0.3727

**Source:** Author's Computation from Stata Version 17 (2024)

Table 4.9 delineates the findings of the Breusch-Pagan / Cook-Weisberg tests. The P-value of 0.3727, being greater than 0.05, suggests that the null hypothesis was not rejected at the 5 per cent level of significance, indicating the absence of heteroscedasticity in the model. Consequently, it was determined that the variability of the errors remains consistent throughout the observations.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND POLICY RECOMMENDATION

#### 5.1 Overview of the Chapter

This chapter offers a concise overview of the study's findings, culminating in the study's conclusion. Furthermore, the chapter delineates the policy implications and offers recommendations, addresses the limitations of the study, and identifies additional areas for future research endeavours.

From 2007 to 2015, the cumulative value of manufactured exports from Kenya to Uganda and Tanzania reached USD 1.85 billion, representing 37.4 per cent of the total exports to the region during that timeframe. The total exports from the East African Community (EAC) experienced a decline of 4.7 per cent, amounting to USD 14.0 billion in 2018, down from USD 14.7 billion in 2017. Notably, intra-EAC exports represented 22.4 per cent of this total, equating to USD 3.2 billion, thereby underscoring the significance of the EAC as a trading bloc, as detailed in The EAC Trade and Investment Report, 2018. The observed decline has been attributed to insufficient advancements in value addition and the modernisation of the agricultural sector, which have adversely impacted export prices. Additionally, the lack of diversification in industrial products suggests limited potential for intra-regional trade in manufactured goods among the EAC Partner States, among other contributing factors (EAC Trade and Investment Report, 2017).

#### 5.2 Summary of the Findings

This study aimed to investigate the influence of macroeconomic aggregates—namely capital expenditure, domestic debt, and population size—on the growth of manufactured exports to Uganda and Tanzania, while considering the standard of living

as a moderating factor. The research employed correlational and descriptive designs to examine the variables in question. Descriptive statistics were calculated to analyse the mean, standard deviation, minimum and maximum values, skewness, and kurtosis of the sample variables.

The findings of this study suggest a positive correlation between manufactured exports and capital expenditure. Furthermore, there existed an inverse correlation between manufactured exports and domestic debt. Furthermore, there exists a favourable correlation between manufactured exports and the size of the population. In a similar vein, one can observe a negative correlation between manufactured exports and the differential GDP per capita.

### **5.2.1 Effect of Capital Expenditure on Manufactured Exports**

The findings demonstrate a significant and negative correlation between capital expenditure and manufactured exports, characterised by a robust correlation coefficient of -0.806 and a p-value of 0.000, which is less than the 0.05 threshold. Within the regression model, capital expenditure exhibits a positive coefficient of 0.588, which is statistically significant, as evidenced by a p-value of 0.000, falling below the threshold of 0.05. Capital expenditure exerts a beneficial influence on the realm of manufactured exports. A coefficient of 0.588 indicates that, assuming other variables remain unchanged, an increase of one unit in capital expenditure results in an increase of manufactured exports by 0.588 units.

Investment in infrastructure diminishes production costs, facilitates access to contemporary technology, and enhances economic returns on labour. Infrastructure additionally enhances the quality of life by establishing amenities, supplying consumable goods, and fostering macroeconomic stability. As production costs

decrease, manufacturing firms will increase output at reduced expenses, enabling them to export at competitive prices, thus enhancing the volume of exports.

### **5.2.2 Effect of Domestic Debt on Manufactured Exports**

The findings indicated a significant and negative correlation between domestic debt and manufactured exports, characterised by a strong correlation value of -0.709 and a p-value of 0.000, which is less than 0.05. The results of the regression model indicate that domestic debt exhibits a negative coefficient of 0.207, which is statistically significant, as evidenced by a p-value of 0.002, falling below the threshold of 0.05. This suggests that domestic debt adversely affects manufactured exports. A coefficient of -0.207 indicates that, all else being equal, an increase of one unit in domestic debt results in a reduction of manufactured exports by 0.207 units. Domestic debt financing tends to inhibit private investment. When governments engage in domestic borrowing, they utilise private savings that would otherwise be accessible to the private sector. This yields two outcomes. Lenders exhibit a preference for extending credit to governments rather than to the private sector. To exemplify their inclination, lenders typically elevate domestic interest rates, which negatively impacts private investment's access to capital. Nonetheless, even in scenarios where interest rates are regulated, domestic borrowing may result in credit rationing and the displacement of private-sector investment.

### **5.2.3 Effect of Population Size on Manufactured Exports**

The findings revealed a notable and inverse correlation between population size and manufactured exports, characterised by a robust relationship, as evidenced by a correlation coefficient of -0.825 and a p-value of 0.000, which is less than 0.05. The results of the regression model indicate that the population size exhibits a positive coefficient of 0.208. The coefficient demonstrates statistical significance, as evidenced

by a p-value of 0.002, which is less than 0.05. This suggests that an increase in population size positively influences manufactured exports. The coefficient of 0.208 indicates that, assuming all other variables remain unchanged, an increase of one unit in population size results in a corresponding increase of 0.208 units in manufactured exports. The size of the population conferred economies of scale upon a nation, establishing a comparative advantage in the realm of manufactured goods.

#### **5.2.4 Gravity Model**

The findings of the study align with the gravity model of international trade, indicating that Kenya tends to export more to nations with larger economic sizes compared to those with similar or lower levels of gross domestic product, as evidenced by a GDP coefficient of 0.588 and a p-value of 0.000 in Table 4.5. Distance serves as a limiting yet relatively minor factor that adversely influences the volume of international trade, as evidenced by the DIS coefficient of -0.027 and a p-value of 0.036 presented in Table 4.5. This phenomenon can be elucidated by the heightened investment in information and communication technology, as well as infrastructure, which has mitigated the trade-restrictive impact of distance.

#### **5.2.5 The Moderating Effect of Differential GDP per Capita (DGC) on the Association between Macroeconomic Aggregates and Manufactured Exports**

The findings revealed a negligible and adverse correlation between the Differential GDP per Capita and manufactured exports, as evidenced by a correlation coefficient of -0.006 and a p-value of 0.977, which exceeds the 0.05 threshold. The results indicated that Differential GDP per Capita exerts a notable positive moderating influence on the relationship between the explanatory variables (capital expenditure, domestic debt, and population size) and the dependent variables (manufactured exports). The incorporation of Differential GDP per Capita into the

model enhanced the overall  $R^2$  value from 0.783 to 0.977. This indicates that the inclusion of Differential GDP per Capita enables the independent variables to collectively account for an additional 0.150 units of variation in the dependent variable. The intervention demonstrates statistical significance, as evidenced by a p-value of 0.000, which is less than 0.05.

### **5.2.6 The Linder's Hypothesis**

Linder's effect was found to exist in Kenya's trade with her two EAC trading partners on the export of manufactured goods, as evidenced by the negative coefficients on the differential GDP per Capita (DGC) of 0.267 with a p-value of  $0.000 < 0.05$  showing statistical significance.

### **5.3 Conclusion**

The study revealed that capital expenditure has a significant positive effect on manufactured exports. Therefore, the null hypothesis that capital expenditure does not have an effect on Kenya's manufactured exports to Uganda and Tanzania was rejected. Second, the study indicated that domestic debt has a significant negative effect on manufactured exports. As such, the null hypothesis that domestic public debt does not have an effect on Kenya's manufactured exports to Uganda and Tanzania was rejected. Furthermore, the study showed that the population size has a significant positive effect on manufactured exports to Uganda and Tanzania. As a result, the null hypothesis that population size does not have an effect on Kenya's manufactured exports to Uganda and Tanzania was rejected. Finally, the study established that Differential GDP per Capita has a significant moderating effect on the association between macroeconomic aggregates (capital expenditure, domestic debt and population size) and manufactured exports to Uganda and Tanzania. Therefore, the null hypothesis that states the standard

of living does not have an effect on Kenya's manufactured exports to Uganda and Tanzania was rejected.

The gravity model was found to be robust, while the Linder effect on trade was found to be present in the export of Kenya's manufactured goods to Uganda and Tanzania.

## **5.4 Policy Recommendations**

### **5.4.1 Capital Expenditure**

To enhance the efficiency of capital, the Kenyan government should:

- i. Invest in R&D, and invest and incentivise novel sectors like the information and communication technology sector; and,
- ii. Employ vigilance against leakage and pilferage of public resources for capital projects by enforcing deterrent measures.

### **5.4.2 Domestic Debt**

The Kenyan government:

- i. Should observe fiscal discipline according to the provisions of the PFM Act, 2012 Section 15 (1) (c) by investing resources generated from domestic debt in development projects; and,
- ii. May limit domestic borrowing by exploring cheaper long-term credit from foreign sources.

### **5.4.3 Population Size**

Therefore, for regional trade on manufactured goods to improve, the Kenyan government need to put in place long-term poverty reduction interventions and strategies in human capital development, infrastructure investment and manufacturing incentives to reap maximum population dividends in the manufacturing sector in terms of higher productivity and innovativeness.

#### **5.4.4 Standard of Living**

- i. The governments of Uganda and Tanzania need to put in place long-term poverty reduction and income-enhancing strategies to reduce income disparity between their countries and Kenya. This will increase demand for industrial goods, thereby increasing production of the same for enhanced intra-regional trade in manufactured goods.

#### **5.5 Areas for Further Research**

The study used the gravity model of international trade, which is based on the relationship between two masses, that is, GDP and the distance as resistance. The recent progress in ICT and infrastructural investment has reduced geographical distance as a friction to trade, hence the study recommends the employment of other indicators, e.g. ICT, to study their effect on international trade.

Also, the study studied the effect of total population size on Kenya's manufacturing exports to the EAC. This did not capture the attributes of the population, e.g. the use of human development indices, dependence ratio, etc. This study, therefore, recommends that future studies consider the qualitative traits of the population and their effect on export.

Lastly, Linder's hypothesis posits that trade, especially in manufactured goods, is influenced by income similarities between trade partners. Gou (2006) made a contrary observation in studying China's trade with other highly developed countries between 2001 and 2004. During this period, despite the income gap between China and its partners being wide, its exports grew faster than trade between the high-income group countries. On closer look, he found a two-fold explanation. One was the trade treaty effect. This corresponded to the time China signed a free trade treaty with the US and the EU in 2001 and finally became a WTO member the same year. Secondly, this was

the time in which China's FDIs grew rapidly, surpassing the US as the biggest foreign investment taker due to its cheap labour. This study consequently recommends future studies using Linder's hypothesis to consider moderating such realities which affect exports. Such realities for the EAC region include the effects of globalisation, in particular the flow of foreign direct investment into the region. Also, other studies can increase the scope of the study in terms of time and countries of study. Lastly, over the last three years, the European Union has targeted the EAC region for Economic Partnership Agreements (EPA). International trade scholars need to pay keen attention to the effect of these agreements on the intra-EAC trade.

## REFERENCE

- Abbas, S. A., & Christensen, J. E. (2017). The role of domestic debt markets in economic growth: An empirical investigation for low-income countries and emerging markets. *IMF staff papers*, 57(1), 209-255.
- Adofu, I., & Abula, M. (2010). Domestic debt and the Nigerian economy. *Current Research Journal of Economic Theory*, 2(1), 22-26.
- Agence France-Presse, 'Tanzania bans Kenya Airways as coronavirus spat escalates', VOA, 1 August 2018.
- Akhter, T., & Hassan, H. (2012). Impact of public debt burden on economic growth: Evidence from Bangladesh. *Journal of Finance and Banking*, 10(1).
- Aldous, D.J. (2016). *Descriptive statistics*. Magnum Publishing LLC.
- Aluthge, C., Jibir, A., & Abdu, M. (2021). Impact of Government Expenditure on Economic Growth in Nigeria, 1970-2019. *Central Bank of Nigeria Journal of Applied Statistics*, 12 (1), 139–174.
- Apere, T. O. (2019). The impact of public debt on private investment in Nigeria: Evidence from a nonlinear model. *International Journal of Research in Social Sciences*, 4(2), 130-138.
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The review of economic studies*, 58(2), 277-297.
- Asante, E. A. (2019). *External debt and economic growth in sub-saharan Africa: the role of country-level governance structures* (Doctoral dissertation, University of Cape Coast).
- Asante-Nimako, I. (2016). *Determinants of Ghana's bilateral export: Does exchange rate variability matter?* (Doctoral dissertation).
- Australian Productivity Commission (2020)
- Babu, J. O., Kiprop, S., Kalio, A. M., & Gisore, M. (2015). Effect of domestic debt on economic growth in the East African community. *American Journal of Research Communication*, 3(9), 73-95.

- Baker, L. (2018). *Beginner's Guide to Correlation Analysis: Learn the One Reason Your Correlation Results are Probably Wrong (and what You Need to Do to Fix Them)*. Independently published.
- Baltagi, B. H., & Baltagi, B. H. (2008). *Econometric analysis of panel data* (Vol. 4, pp. 135-145). Chichester: Wiley.
- Banerji, R. (2018). Major determinants of the share of manufactures in exports: A cross-section analysis and case study on India. *Weltwirtschaftliches Archiv*, 108, 345-381.
- Baranovs, O., Salmins, J., & Skribane, I. (2021). Productivity factors and dynamics in Latvia. *International Journal of Modern Manufacturing Technologies*, 13(1), 1-10. <https://doi.org/10.15555/ijmmt.v13i1.3524>
- Batra, A. (2016). India's global trade potential: The gravity model approach. *Global Economic Review*, 35(3), 327-361.
- Becker, G. S., Glaeser, E. L., & Murphy, K. M. (1999). Population and economic growth. *American Economic Review*, 89(2), 145-149.
- Bhowmik, D. (2019). The Impacts of India's Export to African Blocs: Panel Data Analysis. *Journal of Quantitative Finance and Economics*, 1, 2.
- Borchert, I., & Yotov, Y. V. (2017). Distance, globalization, and international trade. *Economics letters*, 153, 32-38.
- Bukhari, S. A. H. A. S., Ahmad, M. H., Alam, S., Bukhari, S. S. H. A. S., & Butt, M. S. (2005). An empirical analysis of the Linder theory of international trade for South Asian countries. *The Pakistan Development Review*, 307-320.
- Carrère, C., De Melo, J., & Wilson, J. S. (2009). The distance effect and the regionalization of the trade of low-income countries. *Journal of African Economies*, 18(6), 941-965. <https://doi.org/10.1093/jae/ejp015>
- Chaney, T. (2008): "Distorted gravity: the intensive and extensive margins of international trade." *The American Economic Review* 98(4): pp. 1707-1721.
- Chikelu, J. C., & Okoro, V. C. (2016). Impact of capital expenditure on the Manufacturing Sector of the Nigerian Economy. *Journal of Economic Studies*, 10(2), 45-60.

- China, U.N.D.P. (2022). If Africa builds nests, will the birds come. *Comparative study on special economic zones in Africa and China*.
- Choi, C. (2022). Linder hypothesis revisited. *Applied Economics Letters*, 9(9), 601-605.
- Chow, P., & Yochanan, M. K. (1999). A test of the Linder hypothesis in Pacific NIC trade 1965-1990. *Applied Economics*, 31(2), 175-182.
- Cilliers, J., Donnenfeld, Z., Kwasi, S., Shah, S., & Welborn, L. (2018). Kenya to 2030 and Beyond. *Institute for Security Studies (ISS) Report*, August.
- COMESA-EAC-SADC NTB online reporting  
([https://www.tradebarriers.org/register\\_complaint](https://www.tradebarriers.org/register_complaint))
- Coulibaly, S. (2019). *Sustainable Financing for Development: Four Essays on Resource Mobilization in Africa* (Doctoral dissertation, Université Clermont Auvergne [2017-2020]).
- Cunat, A., & Melitz, M. J. (2019). Volatility, labour market flexibility, and the pattern of comparative advantage. *Journal of the European Economic Association*, 10(2), 225-254.
- Davis, Joseph S. 1945. "Standard and Content of Living." *American Economic Review*. March, XXXV:1, pp. 1±15.
- Dawson, P. J., & Sanjuán-López, A. I. (2017). The export-income relationship in developing countries: evidence from panel cointegration. *The Journal of Developing Areas*, 47-62.
- De Soyres, F., Mulabdic, A., & Ruta, M. (2018). *Common transport infrastructure: A quantitative model and estimates from the Belt and Road Initiative*. World Bank Policy Research Working Paper No. 8801.
- Dharma, Y. (2018). The effect of work motivation on the employee performance with organization citizenship behavior as intervening variable at bank aceh syariah. In *Proceedings of MICoMS 2017* (Vol. 1, pp. 7-12). Emerald Publishing Limited.

- Dritsaki, C. (2013). Causal nexus between economic growth, exports and government debt: the case of Greece. *Procedia Economics and Finance*, 5, 251-259.
- Durbin, J., & Watson, G. S. (1971). Testing for serial correlation in least squares regression. III. *Biometrika*, 58(1), 1-19.
- East African Community. (2018). *EAC trade and investment report 2018*. East African Community Secretariat. <https://repository.eac.int/handle/11671/2041>
- East African Community. (2019). *EAC trade and investment report 2019*. EAC Secretariat. <https://doi.org/10.60682/vcjk-m771>
- Easterly, W. (1990). Stanley Fischer. *The World Bank Research Observer*, 5(2), 127-42.
- Edwards, L. J., & Garlick, R. (2008). Trade flows and the exchange rate in South Africa. *South African Journal of Economics*, 76(1), 1-17. <https://doi.org/10.1111/j.1813-6982.2008.00166.x>
- Ekpo, A. H. (1995). Public expenditure and economic growth in Nigeria. *Final Report, AERC, Nairobi Kenya*.
- Ellis, M. (1983). An alternative interpretation and empirical test of the Linder hypothesis. *Quarterly Journal of Business and Economics*, 53-62.
- Emmanuel, F. O., & Oladiran, O. I. (2015). Effect of government capital expenditure on manufacturing sector output in Nigeria. *Business and economic research*, 5(2), 136-152.
- Evans, J., & Mavondo, F. T. (2002). Psychic distance and organizational performance: An empirical examination of international retailing operations. *Journal of international business studies*, 33, 515-532.
- Eze, O. R., & Ogiji, F. (2013). Impact of fiscal policy on the manufacturing sector output in Nigeria: An error correction analysis. *British Journal of Business and Management Research*, 1(2), 31-54.
- Fletcher, I. (2011). *Free trade doesn't work: What should replace it and why*. Coalition for a Prosperous America.

- Fontagné, L., & Santoni, G. (2019). *Income similarity and intra-industry trade: A new look at the Linder hypothesis*. *Review of World Economics*, 155(1), 65–90.
- Francois, J., & Manchin, M. (2013). Institutions, infrastructure, and trade. *World development*, 46, 165-175.
- Freund, C. L., & Weinhold, D. (2004). The effect of the Internet on international trade. *Journal of international economics*, 62(1), 171-189.
- Galor, O., & Weil, D. N. (2000). Population, technology, and growth: From Malthusian stagnation to the demographic transition and beyond. *American economic review*, 90(4), 806-828.
- Gbolonyo, E. Y. (2019). *Determinants of Export Diversification in Ghana* [Master's thesis, University of Ghana].
- Geda, A., & Asongu, S. A. (2022). *The AfCFTA and intra-African trade: What is the role of income similarity and production structure?* *Journal of African Trade*, 9(1), 1–19.
- Gengele, N. (2019). *Transport infrastructure investment and exports growth in South Africa* (Doctoral dissertation, Master's thesis. University of Fort Hare. Online available at: [file:///D:/Users/ThobelaO/Downloads/GENGELE% 20N% 20201205042% 20MCO M. pdf% 20 \(1\). pdf](file:///D:/Users/ThobelaO/Downloads/GENGELE%20N%20201205042%20MCO%20M.pdf) [Accessed on 21 June 2023]).
- Gikonyo, H. W. (2009). *The Effect of the East African Community on Cross Border Trade at the Malaba Border* (Doctoral dissertation, University of Nairobi).
- Gilbert, J., Scollay, R., Bora, B., & CNUCED. (2001). *Assessing regional trading arrangements in the Asia-Pacific*. UN.
- Greene, W. H. (2007). Limdep version 9, Econometric modeling guide, Volume 1. *Econometric Software, Inc., Plainview, New York*.
- Griffiths, W. E., Hill, R. C., & Pope, P. J. (1987). Small sample properties of probit model estimators. *Journal of the American Statistical Association*, 82(399), 929-937.

- Gross, A. K. (2019). *Sub-Saharan Africa and the 4th Industrial Revolution: Technological Leapfrogging as a Strategy to enhance Economic Growth?* [Master's thesis, University of Fribourg].
- Grossman, G. M., & Helpman, E. (1993). *Innovation and growth in the global economy*. MIT press.
- Gujarati, D. N. (2007). *Basic econometrics*. Tata McGraw-Hill Education.
- Gul, N., & Yasin, H. M. (2011). The trade potential of Pakistan. *Journal of Economic Research*, 25(4), 112-125.
- Guo, Y. (2006). *Linder's hypothesis revisited: A study on China and 13 other countries in three different income level groups from 1981 to 2004* [Master's thesis, Ohio University]. OhioLINK Electronic Theses and Dissertations Center. [http://rave.ohiolink.edu/etdc/view?acc\\_num=ohiou1149519737](http://rave.ohiolink.edu/etdc/view?acc_num=ohiou1149519737)
- Hadri, K. (2000). Testing for stationarity in heterogeneous panel data. *The Econometrics Journal*, 3(2), 148-161.
- Hausman, K., Springenberg, J. T., Wang, Z., Heess, N., N., & Riedmiller, M. (2018, February). *Learning an embedding space for transferable robot skills*. In *International Conference on Learning Representations*.
- Heckscher, E. F., Ohlin, B. G., Flam, H., & Flanders, M. (1991). *Heckscher-Ohlin trade theory*. MIT Press.
- Helpman, E. (1987). Imperfect competition and international trade: Evidence from fourteen industrial countries. *Journal of the Japanese and international economies*, 1(1), 62-81.
- Hoftyzer, J. (1984). A further analysis of the Linder trade thesis. *Quarterly Review of Economics and Business*, 24(2), 57-70.
- Hope Sr, K. R. (2014). Kenya's corruption problem: causes and consequences. *Commonwealth & Comparative Politics*, 52(4), 493-512.
- Grančay, M., Grančay, N., & Vveinhardt, J. (2016). Intra-industry trade in the Visegrad countries: Does the Linder hypothesis hold?. *Acta Oeconomica*, 66(2), 283-306.

- Iarossi, G. (2009). Benchmarking Africa's costs and competitiveness. *The Africa competitiveness report*, 85.
- Ibrahim, H. (2015). *Effect of external public debt on economic growth: An empirical analysis of East African countries* (Doctoral dissertation, University of Nairobi).
- Ighodaro, C. A., & Oriakhi, D. E. (2010). Does the relationship between government expenditure and economic growth follow Wagner's law in Nigeria. *Annals of University of Petrosani Economics*, 10(2), 185-198.
- Choi, C. (2002). Linder hypothesis revisited. *Applied Economics Letters*, 9(9), 601-605.
- India Brand Equity Foundation. (2013). *Boosting India's Manufactured Exports*. <https://www.ibef.org/download/Boosting-Indias-Manufactured-Exports.pdf>
- Ingram, M., Ramachandran, V., & Desai, V. (2007). Why do firms choose to be informal? Evidence from enterprise surveys in Africa. *manuscript, The World Bank*.
- Jha, P. K. (2018). *India's macroeconomic policy regime and challenges of employment: some reflections on the manufacturing sector* (Vol. 20). Kassel University Press GmbH.
- Johanson, J., & Wiedersheim-Paul, F. (2017). The internationalization of the firm—four swedish cases 1. In *International Business* (pp. 127-144). Routledge.
- Jošić, H., & Metelko, M. (2018). Testing the validity of the Linder hypothesis for Croatia. *Croatian Review of Economic, Business and Social Statistics*, 4(1), 62-73.
- Kabeta, Z. E. (2017). *Structure and Growth of Service Sector in Ethiopia* (Doctoral dissertation, Doctoral dissertation, Punjabi University, Patiala).
- Kahram, A. (2014). The comparative analysis of the Linder hypothesis: The bilateral trade model between Iran and its trade partners. *Advances in Economics and Business Management (AEBM)*, 1(1), 1-8.
- KAMUNDIA, S. W. (2015). *The effects of public debt on private investments and economic growth in Kenya (1980-2013)* (Doctoral dissertation).

- Karimi, A., & Saadat, R. (2018). The population ageing effect on pattern of export (case of major trade partners of Iran). *Iranian Economic Review*, 25(1), 57-68.
- Kayode, M. O., & Usman, Y. B. (1989). Nigeria since independence: The first 25 years. *Ibadan, Nigeria: Heinemann Books Ltd.*
- Keesing, D. B., & Sherk, D. R. (1971). Population density in patterns of trade and development. *The American Economic Review*, 61(5), 956-961.
- Kennedy, T. E., & McHugh, R. (1980). An intertemporal test and rejection of the Linder hypothesis. *Southern Economic Journal*, 898-903.
- Kimenyi, M. S., & Were, M. (2020). *Manufacturing competitiveness in East Africa: Evidence from trade data*. Brookings Institution, Africa Growth Initiative Working Paper.
- Klasen, S., & Nestmann, T. (2006). Population, population density and technological change. *Journal of Population Economics*, 19, 611-626.
- KPMG. (2015). *Manufactured in Africa: Sector Report*. <https://assets.kpmg.com/content/dam/kpmg/pdf/2015/05/manufactured-in-africa-report.pdf>. Page 10
- KPMG. (2018). “*Manufactured in Africa: Sector Report*”. (<https://assets.kpmg.com/content/dam/kpmg/br/pdf/2016/09/fast-moving-consumer-goods.pdf>). Page 12
- Kremer, M. (1993). Population growth and technological change: One million BC to 1990. *The quarterly journal of economics*, 108(3), 681-716.
- Krugman, P. (1980). Scale economies, product differentiation, and the pattern of trade. *American economic review*, 70(5), 950-959.
- Lai, A. A. L. M. F., & Bujang, I. (2016). The Heckscher-Ohlin versus Linder's Theory: evidence from Malaysian exports. *Journal of Business and Retail Management Research*, 10(2).
- Lawrence, E. (2018). “*African Manufactured firms and their participation in global trade*”. UNIDO

- Leamer, E. E. (1995). The Heckscher-Ohlin model in theory and practice. *Princeton Studies in International Finance*, 77, 1-32.
- Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of econometrics*, 108(1), 1-24.
- Linder, S. B. (1961). *An Essay on Trade and Transformation*. Almqvist and Wiksells.
- Linnemann, H. (1966). *An econometric study of international trade flows*. North-Holland Publishing Company.
- Liu, C., Li, S., & Zhao, X. (2019). Research on the threshold effect of population ageing on the industrial structure upgrading in China. *Chinese Journal of Population Resources and Environment*, 17(1), 87-100.
- Loto, M. A. (2012). Global economic downturn and the manufacturing sector performance in the Nigerian economy (a quarterly empirical analysis). *Journal of Emerging Trends in Economics and Management Sciences*, 3(1), 38-45.
- Lotto, J. (2018). *Domestic debt and economic growth in Tanzania -An empirical analysis* [Master's thesis, Mzumbe University].
- Maana, I., Owino, R., & Mutai, N. (2008, July). Domestic debt and its impact on the economy-the case of Kenya. In *13th Annual African Econometric Society Conference in Pretoria, South Africa from 9th to 11th July* (Vol. 40, No. 346-598).
- Macedoni, L. (2015). *The Effect of Per Capita Income on the Product Scope of Exporters*. mimeo, UC Davis.
- Macedoni, L. (2015). *The Effect of Per Capita Income on the Product Scope of Exporters*. mimeo, UC Davis.
- Maingi, J. N. (2017). The impact of government expenditure on economic growth in Kenya: 1963-2008. *Advances in Economics and Business*, 5(12), 635-662.
- Mansouri, B. (2008, November). Fiscal policy and economic growth: Egypt, Morocco and Tunisia compared. In *Proceeding in UNECA Conference on: Macroeconomic*

- policy, productive capacity and economic growth in Africa. Addis Ababa* (Vol. 4, No. 3, pp. 23-30).
- Maroa, J. W. (2013). *Assessing East Africa Community Initiatives in Managing Emerging Cross Border Criminal Trends* (Doctoral dissertation, University of Nairobi).
- Verhaeghe, E., & Mathieson, C. (2017). *Understanding the East African Community and its transport agenda*.
- Mathee, M., & Naudé, W. (2008). The determinants of regional manufactured exports from a developing country. *International Regional Science Review*, 31(4), 343-358.
- Mbaye, A. A., & Gueye, F. (2020). *Determinants of intra-regional trade in ECOWAS: A gravity model analysis*. *African Development Review*, 32(3), 384–396.
- McPherson, M. A., Redfearn, M. R., & Tieslau, M. A. (2001). International trade and developing countries: an empirical investigation of the Linder hypothesis. *Applied Economics*, 33(5), 649-657.
- Mittelhammer, R. C., & Mittelhammer, R. C. (2013). *Mathematical statistics for economics and business*. New York: Springer.
- Republic of Kenya. (2018). *Third Medium Term Plan 2018–2022: Transforming lives, advancing socio-economic development through the "Big Four"*. The National Treasury and Planning. <https://vision2030.go.ke/wp-content/uploads/2019/01/THIRD-MEDIUM-TERM-PLAN-2018-2022.pdf>, Page 48.
- Memorandum, C. E. (2016). *From economic growth to jobs and shared prosperity*.
- Midi, H., Sarkar, S. K., & Rana, S. (2010). Collinearity diagnostics of binary logistic regression model. *Journal of Interdisciplinary Mathematics*, 13(3), 253-267. <https://doi.org/10.1080/09720502.2010.10700688>
- Morris, Morris David. 1979. *Measuring the Condition of the World's Poor: The Physical Quality of Life Index*. New York: Pergamon.

- Morrison, T. K. (1977). The effects of population size and population density on the manufactured exports of developing countries. *Southern Economic Journal*, 43(3), 1368-1371.
- Tinbergen, J. (1963). *Shaping the world economy: Suggestions for an international economic policy*. Twentieth Century Fund.
- Moyo, T., & Ngepah, N. (2021). *Income similarity and regional trade in Southern Africa: Testing the Linder hypothesis*. *South African Journal of Economic and Management Sciences*, 24(1), a3916.
- Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Quantitative & qualitative approaches* (Vol. 2, No. 2). Acts Press.
- Murray, C. J., Vos, T., Lozano, R., Naghavi, M., Flaxman, A. D., Michaud, C., ... & Haring, D. (2012). Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: *a systematic analysis for the Global Burden of Disease Study 2010*. *The lancet*, 380(9859), 2197-2223.
- Anti-Counterfeit Authority. (2020). *National baseline survey on counterfeit and other forms of illicit trade in Kenya*.31-32  
[https://www.aca.go.ke/images/2020/National\\_Baseline\\_Survey\\_Counterfeit\\_and\\_Illicit\\_Trade\\_In\\_Kenya.pdf](https://www.aca.go.ke/images/2020/National_Baseline_Survey_Counterfeit_and_Illicit_Trade_In_Kenya.pdf)
- Nations, U. (2003). The Determinants and Consequences of Population Trends. *United Nation, New York, ISJ53*.
- Newman, C., & Page, J. M. (2017). *Industrial clusters: The case for special economic zones in Africa* (No. 2017/15). WIDER Working Paper.
- Ngunjiri, J. M. (2019). *Effects of Capital Flight on Economic Growth in Kenya* (Doctoral dissertation).
- Nuroglu, E. (2010). The impact of population on bilateral trade flows in the case of OIC. In *Conference: 2nd International Conference on Islamic Economic Integration*.
- Nurudeen and Usman, (2010), “Government Expenditure and Economic Growth in Nigeria”, 1970-2008:

- Nwanne, T. F. I. (2015). Implications of government capital expenditure on the manufacturing sector in Nigeria. *European Journal of Accounting, Auditing and Finance Research*, 3(10), 19-33.
- Nwanne, T. F. I. (2016). IMPLICATION OF SAVINGS AND INVESTMENT ON ECONOMIC GROWTH IN NIGERIA. *International Journal of Small Business and Entrepreneurship Research*, 2(4), 74-86.
- NWOKOROBIA, C. R., & OKONKWO, I. V. (2019). Government Capital Expenditure and Industrial Production Output: Empirical Evidence From Nigeria: 1981–2022. *African Banking and Finance Review Journal*, 5(5), 14-32.
- Nyahokwe, O., & Ncwadi, R. (2013). The impact of exchange rate volatility on South African exports. *Mediterranean Journal of Social Sciences*, 4(3), 507-513.
- ODI, 'Resolving the unresolved non-tariff barriers in the East African community', 1 January 2016.
- Ogunjimi, J. (2019). The impact of public debt on investment: Evidence from Nigeria. *DBN Journal of Economics & Sustainable Growth*.
- OKOYE, H. C., OKOYE, L. U., OMANKHANLEN, A. E., URHIE, E., & EZEJI, F. N. (2021). The role of financial literacy in poverty reduction. *ATBU Journal of Science, Technology and Education*, 9(3), 199-207.
- Onakoya, A. B., & Somoye, R. O. (2013). The impact of public capital expenditure and economic growth in Nigeria. *Global Journal of Economics and Finance*, 2(1), 1-11.
- Onakoya, B. O., Tella, A. S., & Osoba, M. A. (2012). Investment in telecommunications infrastructure and economic growth in Nigeria: A multivariate approach. *British Journal of Economics, Management & Trade*, 2(4), 309-326.
- Onifade, S. T., Çevik, S., Erdoğan, S., Asongu, S., & Bekun, F. V. (2020). An empirical retrospect of the impacts of government expenditures on economic growth: new evidence from the Nigerian economy. *Journal of Economic Structures*, 9(1), 6.

- Owusu-Afriyie, E. (2019). *Ghana's Export Performance: The Role of Exchange Rate Volatility, Exchange Rate Policies and Challenges to Export Diversification* (Doctoral dissertation, University of Ghana).
- Parshotam, A. (2018). *Can the African Continental Free Trade Area offer a new beginning for trade in Africa?* (Vol. 280). South African Institute of International Affairs.
- Pegkas, P. (2018). The effect of government debt and other determinants on economic growth: The Greek experience. *Economies*, 6(1), 10.
- Peng, C. (2017). *An Empirical Study on the Relationship Between Financial Development and Industry Export Structures* (Doctoral dissertation, HEC Montréal).
- Phillips, P. C., & Moon, H. R. (1999). Linear regression limit theory for nonstationary panel data. *Econometrica*, 67(5), 1057-1111.
- Phillips, P. C., & Moon, H. R. (2000). Nonstationary panel data analysis: An overview of some recent developments. *Econometric reviews*, 19(3), 263-286.
- Productivity Commission. (2003). "*Trends in Australian Manufactured*". A Commission Research paper.
- Public Finance Management Act, No. 18 of 2012, Laws of Kenya, Section 12 (2) (c).
- Putunoi, G. K., & Mutuku, C. M. (2013). Domestic debt and economic growth nexus in Kenya. *Current Research Journal of Economic Theory*, 5(1), 1-10.
- Qureshi, U. A., French, G. L., & Sailors, J. W. (1980). Linder's trade thesis: A further examination. *Southern Economic Journal*, 933-936.
- Richardson, P., Howarth, R., & Finnegan, G. (2004). *The challenges of growing small businesses: Insights from women entrepreneurs in Africa*. Geneva: International Labour Office.
- Rijesh, R. (2017). International trade and productivity growth. *Journal of Economic Research*, 12(3), 56-78.
- Guest, R. (2004). *The shackled continent: Africa's past, present and future*. Macmillan

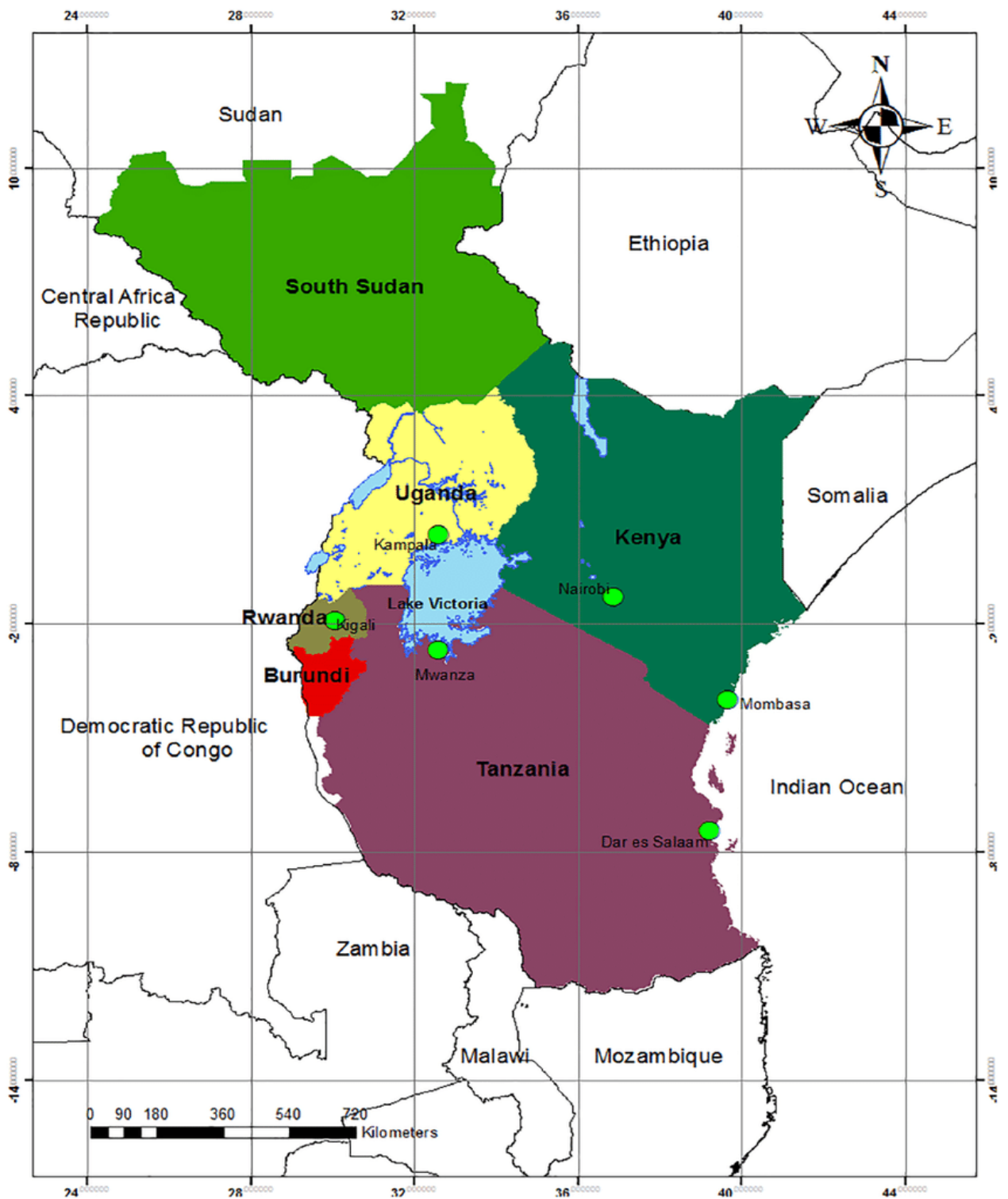
- Saint-Paul, G. (1997). Is labour rigidity harming Europe's competitiveness? The effect of job protection on the pattern of trade and welfare. *European Economic Review*, 41(3-5), 499-506.
- Samson, A. A. (2013). Government spending and economic growth in Nigeria. *Munich Personal RePEc Archive (MPRA)*, 2(5), 1-23.
- Sanders, J. J. (2000). The World Bank and the IMF: Fostering Growth in the Global Market. *Currents: Int'l Trade LJ*, 9, 37.
- Saygılı, F., & Manavgat, G. (2014). Linder Hypothesis: "An Empirical Analysis on Turkey's Foreign Trade". *Ege Academic Review*, 14(2), 261-270.
- Sekkat, K., & Varoudakis, A. (2000). Exchange rate management and manufactured exports in Sub-Saharan Africa. *Journal of Development Economics*, 61(1), 237-253.
- Sen, S. (2010). International trade theory and policy: A review of the literature. *Journal of Economic Thought*, 5(2), 112-130.
- Sheikh, M. R., Faridi, M. Z., & Tariq, K. (2010). Domestic debt and economic growth in Pakistan: An empirical analysis. *Pakistan Journal of Social Sciences*, 30(2), 373-387.
- Siliverstovs, B., & Schumacher, D. (2009). Estimating gravity equations: to log or not to log?. *Empirical Economics*, 36, 645-669.
- SOMOYE, R. O. C., & ONAKOYA, A. B. (2013). Macroeconomic implication of currency management in Nigeria: A synthesis of the literature. *British Journal of Economics*, 8(1).
- South African Reserve Bank.(2014). *Quarterly Bulletin No. 273*, September. (Pretoria: South African Reserve Bank)
- Stojčić, N., Vojinić, P., & Aralica, Z. (2018). Trade liberalization and export transformation in new EU member states. *Structural Change and Economic Dynamics*, 47, 114-126.

- Sultanuzzaman, M. R., Fan, H., Mohamued, E. A., Hossain, M. I., & Islam, M. A. (2019). Effects of export and technology on economic growth: Selected emerging Asian economies. *Economic research-Ekonomska istraživanja*, 32(1), 2515-2531.
- Suranovic, S. (1997). International Trade Theory and Policy: The Heckscher-Ohlin (Factor Proportions) Model. *The International Economics Study Center*, 2005.
- The Economist. (2016). “*Manufactured in Africa: Still Struggling with the Basics*”. (<http://country.eiu.com/article.aspx?articleid=774034461#>)
- EAC. (2009). *The time-bound programme for the elimination of identified non-tariff barriers in EAC*.
- The Treaty for the Establishment of the East Africa Community 2006-1999
- Thursby, J. G., & Thursby, M. C. (1986). Bilateral trade flows, the Linder hypothesis, and exchange risk. *The Review of Economics and Statistics*, 488-495.
- TradeMark Africa. (2025). *Growing prosperity through trade*. <https://trademarkafrica.com/>
- Tullock, G. (2008). Efficient rent seeking. In *40 Years of Research on Rent Seeking I* (pp. 105-120). Springer, Berlin, Heidelberg.
- Udoka, C. O., & Anyingang, R. A. (2015). The effect of public expenditure on the growth and development of Nigerian economy (1980-2012). *International Review of Management and Business Research*, 4(3), 823.
- UNCTAD. (2017). *Key Statistics and Trends*.
- UNCTAD. (2018). “*East African Regional Intergration: Trade and Gender Implications*”
- United Nations Industrial Development Organization. (2017). [*Annual Report 2017*].
- Ungerer, L. M., & Strasheim, A. (2019). The moderating effect of living standards on the relationship between individual-level culture and life satisfaction: A value segmentation perspective. *Management Dynamics: Journal of the Southern African Institute for Management Scientists*, 20(3), 25-50.

- United Nations Development Program. 1999. *Human Development Report 1999*. New York: Oxford University Press.
- Weerahewa, J. (2009). Impact of trade facilitation measures and regional trade agreements on food and agricultural trade in South Asia (No. 69). *Asia-Pacific Research and Training Network on Trade working paper series*, 45-59.
- Were, M. (2021). *The impact of external debt on economic growth in Kenya: An empirical assessment* (No. 2001/116). WIDER discussion paper.
- Wooldridge, J. M. (2018). *Econometric analysis of cross section and panel data*. MIT press.
- World Bank, IMF (2001). *Developing government bond markets: a handbook*. The World Bank.
- World Trade Organization. (2018). *Trade policy review*. [https://www.wto.org/english/tratop\\_e/tpr\\_e/tpr\\_e.htm](https://www.wto.org/english/tratop_e/tpr_e/tpr_e.htm)
- Ye, J., He, C., Liu, J., Wang, W., & Chen, S. (2017). Left-behind elderly: shouldering a disproportionate share of production and reproduction in supporting China's industrial development. *The Journal of Peasant Studies*, 44(5), 971-999.
- Zhang, S., Ondrich, J., & Richardson, J. D. (2020). The link between trade and income: export effect, import effect, or both. *faculty. maxwell. syr. edu/jondrich/PapersOnLine/shuo. jan. dave-10. pdf*.
- Zhou, H. (2019). Population growth and industrialization. *Economic Inquiry*, 47(2), 249-265.

## APPENDICES

### APPENDIX I: STUDY AREA- THE MAP OF EAST AFRICA



Source: Google Maps

## APPENDIX II: DATA

YEAR	COUNTRY	MXE (M- USD)	KXM (M- USD)	DMD (M- USD)	POP (M)	GDP (B- USD)	DIS(KM)	DGC(USD)	CC
2007	Kenya		9610.36	4783.69	38.7	31.96			1
2008	Kenya		1890.94	5178.48	39.8	35.91			1
2009	Kenya		1562.29	5209.29	40.9	42.35			1
2010	Kenya		1195.81	6525.01	42.1	45.41			1
2011	Kenya		1117.51	6952.51	43.2	46.87			1
2012	Kenya		1719.69	9124.65	44.3	56.41			1
2013	Kenya		1634.73	10339.31	45.5	61.67			1
2014	Kenya		3862.45	12310.94	46.7	68.29			1
2015	Kenya		2164.91	11944.24	47.9	70.12			1
2016	Kenya		2390.07	13917.72	49.1	74.82			1
2017	Kenya		2027.73	16172.36	50.2	82.04			1
2018	Kenya		1999.09	19487.79	51.4	92.21			1
2007	Uganda	682.65	1102.23	1400	29.49	11.91	504.15	685.1	1
2008	Uganda	655.42	738.23	1800	30.43	14.44	504.15	527.6	1
2009	Uganda	599.57	913.77	1350	31.41	25.13	504.15	465.7	1
2010	Uganda	636.11	1411.72	1400	42.43	26.67	504.15	545.2	1
2011	Uganda	845.25	1053.11	1600	33.48	27.87	504.15	486.5	1
2012	Uganda	800.78	774.61	2100	34.46	27.31	504.15	840.1	1
2013	Uganda	760.01	1057.28	2400	35.71	28.92	504.15	1109.6	1
2014	Uganda	693.62	1350.84	3000	36.91	32.61	504.15	1299.7	1
2015	Uganda	695.18	1066.64	2900	38.23	32.39	504.15	1592.6	1
2016	Uganda	614.87	1133.11	3700	39.65	29.21	504.15	1884.7	1
2017	Uganda	596.03	1130.62	3600	41.17	30.74	504.15	2184.5	1
2018	Uganda	612.33	1494.59	3800	42.73	32.93	504.15	2000.9	1
2007	Tanzania	406.69	1433.89	2585	40.68	21.84	672.97	673.3	1
2008	Tanzania	453.08	1686.78	2857	41.85	27.96	672.97	565.2	1
2009	Tanzania	390.31	2138.66	3146	43.07	29.08	672.97	525.2	1
2010	Tanzania	406.62	2057.64	3346	44.35	32.01	672.97	586.6	1
2011	Tanzania	464.51	2594.31	3567	45.67	34.66	672.97	565.2	1
2012	Tanzania	546.61	2882.68	3566	47.05	39.65	672.97	803.5	1
2013	Tanzania	470.93	2503.83	4675	48.48	45.68	672.97	987.1	1
2014	Tanzania	487.51	2227.01	5180	49.96	49.96	672.97	1214.8	1
2015	Tanzania	341.34	2000.74	4057	51.48	47.38	672.97	1462.1	1
2016	Tanzania	344.21	3343.82	4057	53.09	49.77	672.97	1607.1	1
2017	Tanzania	274.11	3409.04	6365	54.66	53.28	672.97	1855.3	1
2018	Tanzania	294.41	3720.46	6811	56.31	57.01	672.97	2332.6	1

**Source:** Author's computation based on various sources, 2024

### APPENDIX III: UNIT ROOT TESTS

#### Unit Root at Levels

Variable	Levin-Lin-Chu		Haris-Tzavalis	
	t-statistic	p-value	t-statistic	p-value
<b>MXE</b>	-0.347	0.364	-0.773	0.220
<b>KXM</b>	0.142	0.557	-5.242	0.000
<b>DMD</b>	3.187	0.999	2.727	0.997
<b>POP</b>	2.455	0.993	0.436	0.668
<b>GDP</b>	0.702	0.241	1.576	0.943
<b>DGC</b>	5.183	1.000	5.553	1.000

Source: Author's computation based on Stata, 2024

#### Unit Root at First Difference

Variable	Levin-Lin-Chu		Haris-Tzavalis	
	t-statistic	p-value	t-statistic	p-value
<b>MXE</b>	-1.453	0.073	-4.653	0.000
<b>KXM</b>	-4.150	0.000	-5.355	0.000
<b>DMD</b>	-7.849	0.000	-5.110	0.000
<b>POP</b>	-1.948	0.023	-8.504	0.000
<b>GDP</b>	-4.891	0.000	-4.891	0.000
<b>DIS</b>	-4.180	0.000	-4.180	0.000
<b>DGC</b>			-1.861	0.031

Source: Author's computation based on Stata, 2024

#### Unit Root at Second Difference

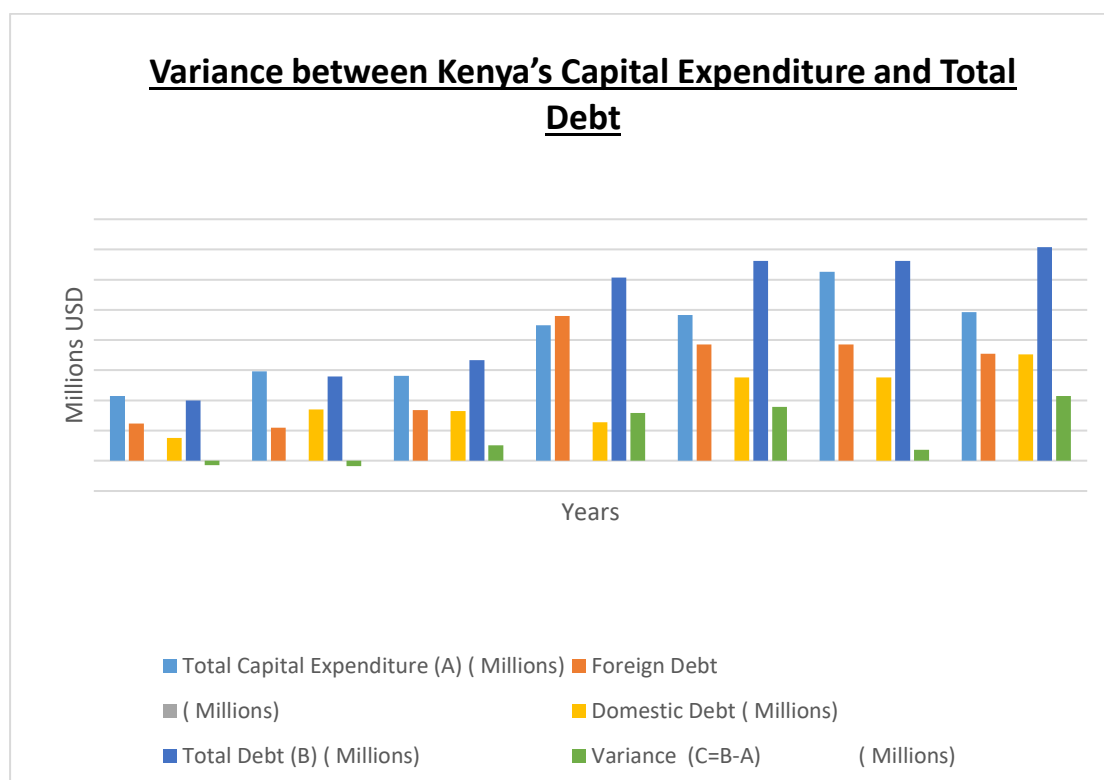
Levin-Lin-Chu		
Variable	t-statistic	p-value
<b>MXE</b>	-1.955	0.025
<b>DGC</b>	-5.422	0.000

Source: Author's computation based on Stata, 2024

**APPENDIX IV: VARIANCE BETWEEN KENYA’S CAPITAL EXPENDITURE  
AND TOTAL DEBT**

Year	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Total Capital Expenditure (A) (Millions)	214,754.27	296,646.83	281,850.10	448,767.43	483,066.22	625,780.13	492,387.11
Foreign Debt (Millions)	123,900.00	109,300.18	167,555.79	479,281.03	385,744.64	385,744.64	354,977.00
Domestic Debt (Millions)	76,036.61	169,776.28	165,338.55	127,892.59	276,152.79	276,152.79	352,549.93
Total Debt (B) (Millions)	199,936.61	279,076.46	332,894.35	607,173.62	661,897.43	661,897.43	707,526.93
Variance (C=B-A) (Millions)	-14,817.66	-17,570.37	51,044.25	158,406.19	178,831.21	36,117.30	215,139.82

**Source:** Author’s computation



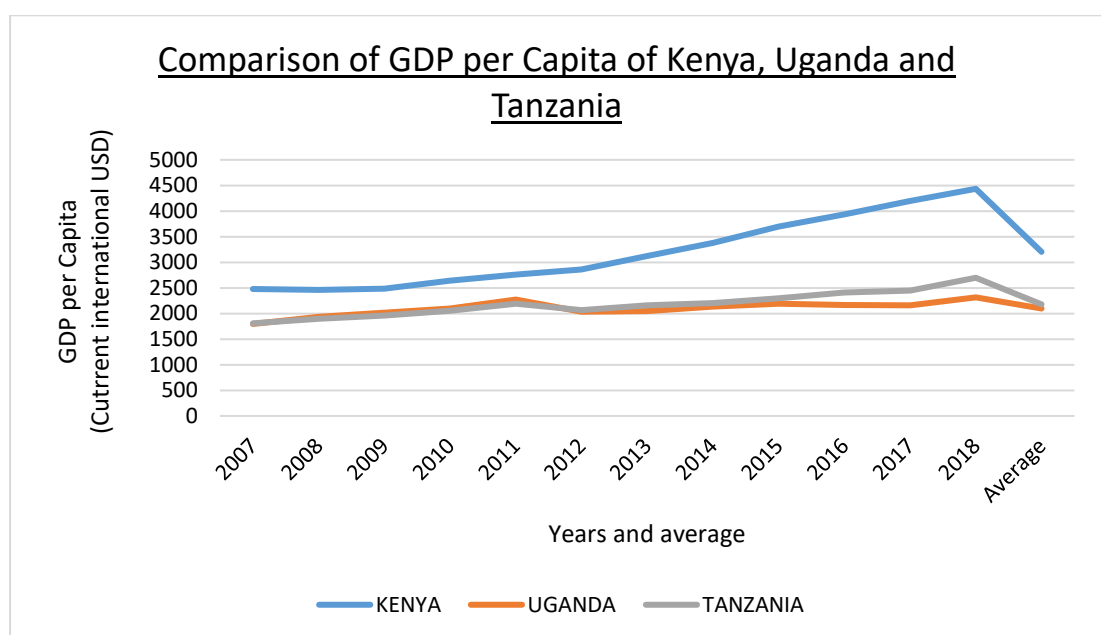
**Source:** Author’s computation based on MS Excel

## APPENDIX V: EAC GDP per Capita, PPP (Current International, USD)

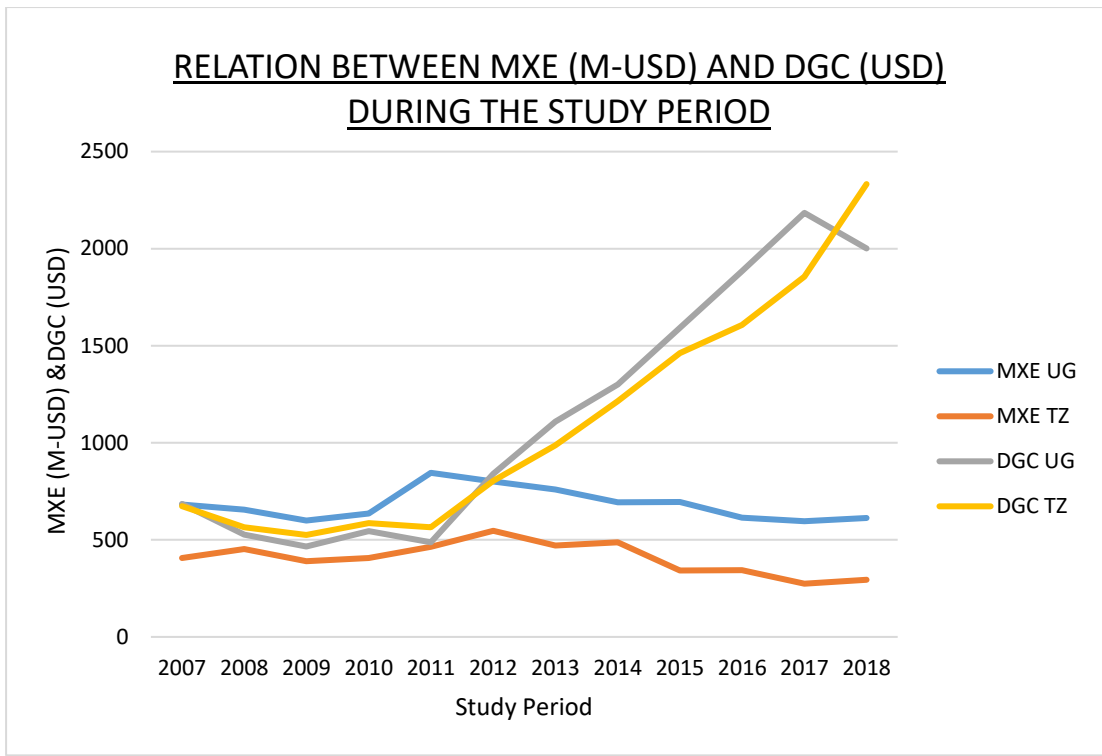
Source: World Bank Group Data

YEAR	KENYA	UGANDA	TANZANIA
2007	2481.1	1796	1807.7
2008	2460.3	1932.6	1895
2009	2482.8	2017.1	1957.6
2010	2640	2094.7	2053.3
2011	2758.2	2271.7	2193
2012	2857.9	2035.7	2065.5
2013	3119.9	2048.6	2157.2
2014	3375.6	2137.5	2200.9
2015	3696.9	2193.1	2294.3
2016	3936.7	2168.1	2408.8
2017	4198.6	2160.7	2445.5
2018	4434	2314.9	2697.2
<b>Average</b>	<b>3204</b>	<b>2097</b>	<b>2181</b>

Source: World Bank Group Data



Source: Author's computation based on MS Excel (2021)



**Source:** Author's computation based on MS Excel (2021)

## APPENDIX VI: FIXED EFFECT REGRESSIONS

		Numbers of Observations=24		Number of Groups=2	
	<sup>2</sup> Within	0.8661	Average		11.5
	R <sup>2</sup> Between	0.8902	Maximum		12
	R <sup>2</sup> Overall	0.8563	F(5,16)		1.97
	Corr( $\mu_i, X\beta$ )	0.1488	Prob>F		<b>0.1452</b>
Variable	Coefficient	Std. Error	t-statistic	P> t	
LnPOP	-0.6605	0.297	-2.23	0.040	
LnGDP	0.2766	0.119	2.32	0.033	
LnDD	-0.0602	0.072	-0.84	0.415	
LnKX	0.0026	0.039	0.07	0.948	
LnDIS	-1.0455	0.145	7.19	0.000	
_cons	5.0384	0.760	6.63	0.000	
Sigma_u	4.6001				
Sigma_e	0.0769				
Rho	0.9997				

**F test that all  $u_i=0$ : F (2, 17) =8871.**

**Source:** Author's computation based on Stata, 2024

## APPENDIX VII: MMUST PERMIT

Tel: 0702597361  
Tel: 0733120020  
email: [deansobe@mmust.ac.ke](mailto:deansobe@mmust.ac.ke)  
website: [mmust.ac.ke](http://mmust.ac.ke)



P.O Box 190  
Kakamega 50100  
Kenya

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY  
(MMUST)  
SCHOOL OF BUSINESS AND ECONOMICS (SOBE)

**REF:** ECO/G/01-53840/2019      **DATE:** 14<sup>th</sup> December, 2022

**TO:** ELLAM OSABWA OMUHINDA

**SUBJECT:** SUCCESSFUL DEFENCE OF RESEARCH  
PROPOSAL, ELLAM OSABWA OMUHINDA  
REG. NO. ECO/G/01-53840/2019

The above subject refers.

Following your successful defense of your research proposal titled "*Effect of Macroeconomic Variables on Kenya's Manufactured Exports to Uganda and Tanzania*" before the School of Business and Economics Graduate Studies Committee, your research proposal is hereby submitted to Director School of Graduate Studies for documentation and processing. Your supervisors are **Prof. John Byaruhanga and Dr. Reuben Rutto**.

On behalf of the School of Business and Economics Graduate Studies Committee, you are hereby permitted to proceed and collect the data needed to complete your thesis.

By copy of this letter, relevant institutions/bodies are humbly requested to assist you in achieving your endeavor.



**PROF. ROBERT K.W. EGESSA**  
Associate Professor and Dean  
School of Business and Economics  
Mobile: 0722-672-264  
Email: [regessa@mmust.ac.ke](mailto:regessa@mmust.ac.ke)

APPENDIX VIII: NACOSTI LICENSE

REPUBLIC OF KENYA  
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 500009  
Date of Issue: 22/December/2022

**RESEARCH LICENSE**




This is to Certify that **Mr. ELLAM OSABWA OMUHINDA** of Masinde Muliro University of Science and Technology, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: **EFFECT OF MACRO ECONOMIC VARIABLES ON KENYA'S MANUFACTURED EXPORTS TO UGANDA AND TANZANIA** for the period ending : 22/December/2023.

License No: NACOSTI/P/22/22842

Applicant Identification Number: 500009

Director General  
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code



**NOTE:** This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions