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# Assessing the effect of cross border facilitation measures on trade costs in the East Africa region

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Donna Atieno  
*Strathmore Business School*  
*Strathmore University*



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**ASSESSING THE EFFECT OF CROSS BORDER FACILITATION MEASURES ON  
TRADE COSTS IN THE EAST AFRICA REGION**



**A RESEARCH DISSERTATION SUBMITTED TO THE STRATHMORE  
UNIVERSITY BUSINESS SCHOOL IN PARTIAL FULFILLMENT FOR THE  
DEGREE OF MASTER OF SCIENCE IN DEVELOPMENT FINANCE OF  
STRATHMORE UNIVERSITY**

**OCTOBER 2021**

## DECLARATION

I declare that this work has not been previously submitted and approved for a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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Name of Candidate: Donna Atieno

Approval

The dissertation of Donna Atieno was approved by the following:

Name of Supervisor: Dr. Bernadette Wanjala



13.10.2021

School/Institute/Faculty: Strathmore University Business School

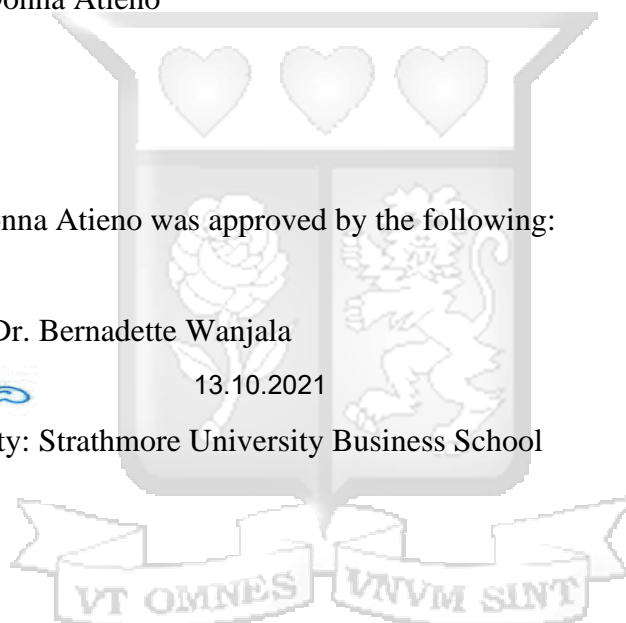
Dr. George Njenga

Executive Dean

Strathmore University Business School.

Dr. Bernard Shibwabo

Director, Office of Graduate Studies



## ABSTRACT

Successive rounds of multilateral trade negotiations over the years have progressively reduced traditional barriers to trade such as tariffs and quotas which are readily measurable. However, as trade becomes more liberalized, focus has now shifted to other determinants of international trade that add costs to goods as they cross borders such as procedures, paperwork and administrative formalities. Reducing these costs enabled firms take advantage of new market openings. Cross border trade facilitation particularly has been identified as a tool for increased and smoother trade between countries. In Africa, the East African countries have followed suit to encourage intra-regional trade among Partner States resulting in the need to assess the effects of these facilitation measures on trade cost. This study was guided by two objectives: to assess the effect of cross-border trade facilitation measures on trade costs in East African region; and to assess the control effect of GDP per Capita on the relationship between cross-border trade facilitation measures and trade costs in the East African region. The study was underpinned by the positivism philosophy with three theories: Comparative Advantage; Heckscher – Ohlin Model; and Simple Iceberg partial equilibrium model used as guiding principles. Panel data from secondary sources was collected and analyzed in relation to the objectives. The research conducted diagnostics tests and utilized the random effects panel regression in testing for the magnitude of the relationship between the study variables. The analysed research data was presented using tables. The findings of the study showed that overall, trade facilitation measures and GDP per capita had a positive and significant influence on the trade costs. The study concluded that: customs and border management (time to import and export and cost to import and export) have an insignificant influence on average trade costs within the region; infrastructure development index had a positive and significant influence on trade costs; the regulatory quality index had an insignificant influence on trade costs; and GDP per capita had a negative and significant influence on the trade costs. The study recommended that member states should invest more in improving their infrastructure which is critical in conducting trade in the region; that member states should formulate and implement policies that can boost economic growth and development; and that member states should ramp up their efforts to implement the trade facilitation measures by taking advantage of the technical capacity building being offered by WTO as part of the Trade facilitation Agreement (TFA) to build its capacity to implement the trade facilitation reforms.

**Key Words:** Trade Facilitation, Trade Cost, Regional Integration, East Africa Region

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## LIST OF ABBREVIATIONS

<b>AfCFTA</b>	The African Continental Free Trade Area
<b>AfDB</b>	Africa Development Bank
<b>ASEAN</b>	Association of Southeast Asian Nations
<b>EAC</b>	East Africa Community
<b>ETI</b>	Enabling Trading Index
<b>IMF</b>	International Monetary Fund
<b>GATT</b>	General Agreement on Tariffs and Trade
<b>GDP</b>	Gross Domestic Product
<b>GVC</b>	Global Value Chain
<b>MENA</b>	Middle East and North Africa
<b>OECD</b>	Organization for Economic Co-operation and Development
<b>RTA</b>	Regional Trade Agreement
<b>TF</b>	Trade Facilitation
<b>TFI</b>	Trade Facilitation Indicators
<b>UNCTAD</b>	United Nations Conference on Trade and Development
<b>TFAF</b>	Trade Facilitation Agreement
<b>TFAF</b>	Trade Facilitation Agreement Facility
<b>WEF</b>	World Economic Forum
<b>WTO</b>	World Trade Organization



## DEDICATION

This work is dedicated to my daughter Aria. I hope one day you will read this and be inspired.



## ACKNOWLEDGEMENTS

I would like to thank the Almighty God for his grace throughout this programme.

My sincere gratitude to my supervisor Dr. Bernadette Wanjala for her encouragement and guidance throughout this research process.

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God bless you all.



## **CHAPTER ONE: INTRODUCTION**

### **1.1 Introduction**

The study background is introduced in this chapter and it assesses the facilitation measures on cross border trade costs. It provides an overview of trade facilitation and how it can be measured and highlights the potential benefits of its implementation. Additionally, it reviews the global trends on trade costs and focuses the study in the East Africa Region. The chapter also includes a statement of the problem, the research objectives, and questions, the scope of the study, and the significance of the study.

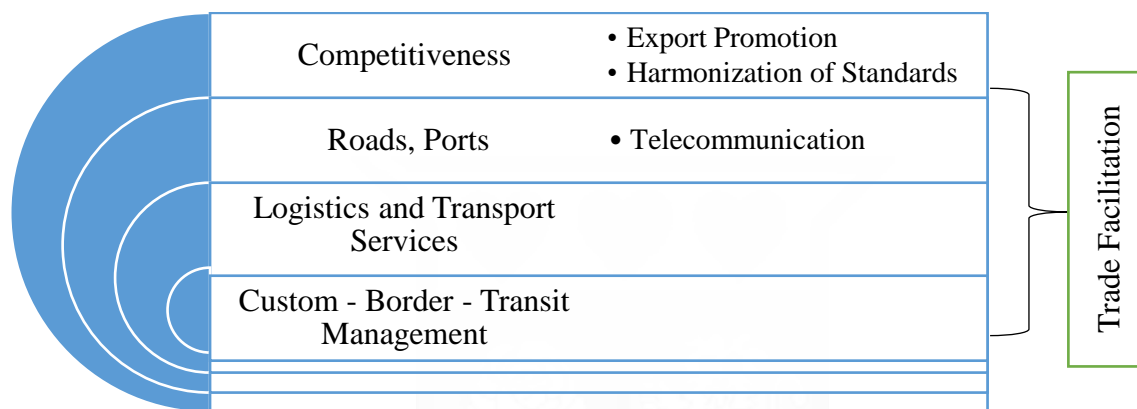
### **1.2 Background of the Study**

There is an accelerated growth of the world economy resulting from an increase in international trade due to technological developments and deliberate efforts to reduce trade barriers (UNCTAD, 2011). This evolution started in 1947 with formation of General Agreement on Tariffs and Trade (GATT). GATT further liberalized trade through eight negotiation rounds with the final round (commonly known as the Uruguay round), establishing the World Trade Organization (WTO). Currently, WTO has 164 member countries representing 98 percent of world trade deals with the rule of trade among countries and assists in the administration of multilateral trade agreements where more than three countries are involved (WTO, 2015).

Successive rounds of multilateral trade negotiations have progressively reduced traditional barriers to trade such as tariffs and quotas, which are readily measurable. The focus has now shifted to the less observable trade costs, such as procedures, paperwork, and administrative formalities that add costs to the goods as they cross borders. Addressing these costs will enable firms to take advantage of new market openings and allow countries to diversify their production into the Global Value Chain (GVC) as they was able to effortlessly integrate with the broader global economy (OECD, 2018). Further, Sakyi, Villaverde, Maza, and Bonuedi (2017) also concluded that the effectiveness and realization of trade gains depend on their facilitation. It is no wonder that in recent times, there has been greater emphasis on trade facilitation reforms spearheaded by WTO, United Nations Conference on Trade and Development (UNCTAD), and World Bank through the WTO Trade Facilitation Agreement Facility (TFAF).

Trade Facilitation (TF) is the practice of simplifying trade procedures to create a healthy environment for cross-border trade (WTO, 2019). Wilson and Otsuki (2007) identify reforming the ports, harmonization of standards, streamlining of regulatory requirements, and the use of information technology as key measures to reducing trade costs. Rippel (2011) concluded that the focus of facilitation measures should be on the cost of transport and logistics, physical infrastructure, and additional barriers to trade, such as mandatory quality and safety standards.

These components are as shown in the figure below:



**Figure 1.1 Components of Trade Facilitation**

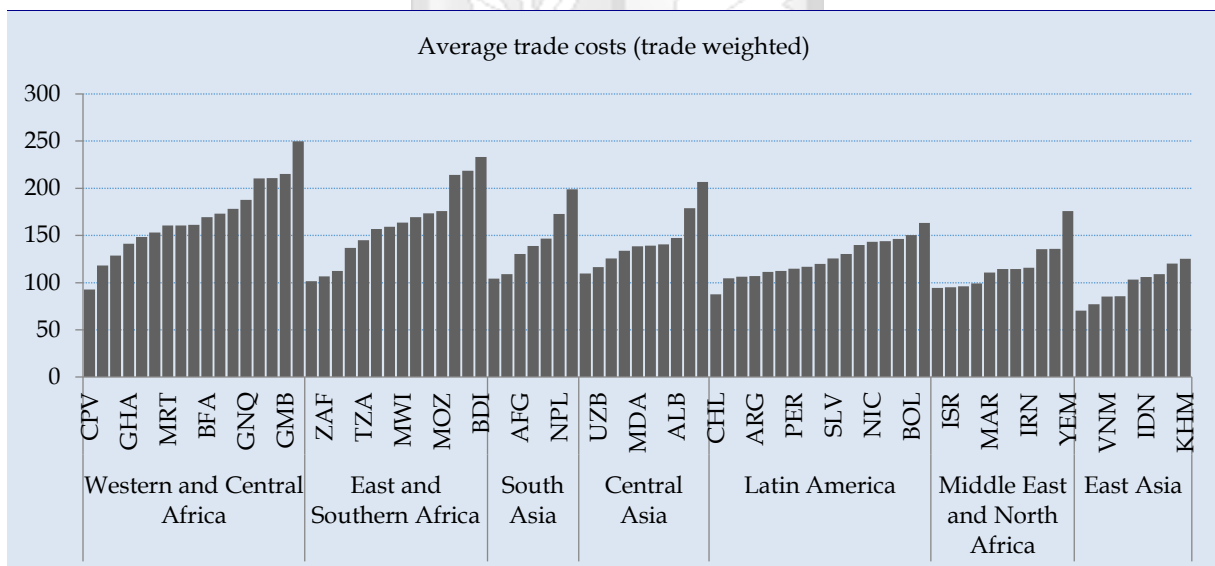
*Source: Adopted from Rippel (2011).*

Figure 1.1 above enables countries to identify constraints along the supply chain that increase trade costs. Once the critical constraints are identified, specific TF interventions can be designed and implemented. Additionally, OECD/WTO (2015) noted that trade facilitation, trade-related infrastructure, and creating a trade-enabling environment are essential for any country seeking GVC integration and are generally guided by regional co-operation initiatives.

In December 2013, WTO members adopted the “Bali Package” whose main component was the Trade Facilitation Agreement (TFA). This agreement provides for the expedition of movement, clearance, and release of goods and goods in transit; mechanism for cooperation between customs and other appropriate authorities on TF matters; and technical assistance and capacity building Developing Countries and Least Developed Countries (LDCs) in implementing the TFA. This will help to improve transparency, increase possibilities to participate in global value chains, and reduce the scope for corruption (WEF, 2016) as well as to simplify and harmonize international trade procedures (WTO,2015). AfDB (2019) predicts that should policymakers implement TFAF; it will reduce the time taken to cross borders and

the transaction costs. These measures, together with the removal of tariffs and non-tariff barriers, could result in income gain of about 3.5 percent of Africa’s GDP.

Trade costs encompass all the additional costs incurred to get the finished products from the producer to the shelves of the final retailer for access to the consumer for use (Portugal-Perez & Wilson, 2008). Generally, logistics performance, distance, border management connectivity are major determinants of trade costs, more so than tariffs. OECD (2018) reports that trade costs arise from the processes involved when getting goods to the border (transport and logistics costs); documentation and customs compliance requirements, restrictive administrative bureaucracy, documents preparation and non-tariff barriers such as corruption and bribery. These costs can be exogenous (beyond a country’s control such as remoteness) and endogenous (linked to national policies). It is estimated that trade costs in developing countries are, on average, 1.8 times higher than in developed countries (UNCTAD, 2016). On average, only 10 percent of trade costs are tariffs related, 10 – 30 percent relate to geographical and cultural factors while the remaining 60 - 80 percent relates to non-tariff policy measures such as trade procedures, regulatory environment, connectivity and service and availability and use of ICT services (OECD/ WTO, 2015). The average trade costs are as shown below:



**Figure 1.2 Average Trade Costs (in USD)**

Source: OECD/WTO (2015)

According to figure 1.1 above, among African countries, Western and Central African countries have the highest trade costs, followed by East and Southern African countries and North African countries, respectively. Examining the specific countries of interest in this study,

we note that the average ad valorem trade costs in Burundi are \$233.23; Rwanda is \$218.48; Uganda is \$169.27; Tanzania is \$144.92, and Kenya is \$136.91. Furthermore, South East Asian countries have the lowest trade costs among the developing regions with ad valorem trade costs ranging from \$70.20 to \$125.25, which is significantly lower than that of the East Africa region.

Duval, Utoktham and Kravchenko (2018) reported that implementation of the WTO TFA resulted in a reduction of trade costs by 15% among Asian-Pacific countries and that full implementation of these standard procedures and cross-border trade facilitation measures is projected to reduced trade costs amounting to \$1.2 trillion. Fiankor, Haase and Brummer (2021) lauded the surge in standardized non-tariff trade facilitation measures for their potential in promoting consumer trade participation by reducing information asymmetry, enhancing sustainability and mitigating risks associated with consumption standards. However, the study argues that such measures include compliance requirements that may seem protectionist of specific players' interests, with associated regulatory requirements increasing the cost of trading. The study also conclusively establishes a strong relationship between the cost of trading and volume of items traded, and asserts that stricter importer standards are restrictive of trade.

In Albania, Fernandes, Hillberry and Alcantara (2021) reported increased volumes of imports after the introduction of measures that saw a sharp decline in physical inspection requirements and associated costs, reporting no compelling evidence that reduced inspections led to an increase in evasive behavior. Duval and Hardy (2021) associated the adoption of cross-border paperless trade with significant reduction in trade costs and environmental burdens. Iloh and Ojukwu (2021) reported that a prevalence in tariff barriers and non-tariff barriers and documentation requirements were among the main factors contributing to high cost associated with intra-African trade. Ngouhouo, Nchofoung and Kengdo (2021) reported a strong association between drivers of trade openness and trade costs, showing reduced costs with increase in governance effectiveness, rule of law and regulatory quality.

The African Continental Free Trade Area (AfCFTA) marked a major step for the continent in terms of the journey towards African continental integration. In 2018, the AfCFTA agreement established a legal framework for a single free trade area over the whole continent with a comprehensive integration agenda in parallel to the established regional agreements. This is seen as a major milestone in the campaign towards the African Union's Agenda 2063 which

aims to promote inclusion and sustainable development across the continent. Bernhard and Eva (2021) report that lack of regional cointegration in Africa has been the main contributor to the high cost of intra-Africa trade and high volume of imports and exports to the rest of the world. The above studies affirm the existence of abundant factors that affect trade costs.

According to OECD/ WTO (2015), the EAC (East Africa Community) blueprint borrows heavily from the successes of the South East Asian countries by focusing on upgrading its physical and institutional infrastructure to facilitate trade and value chain integration. Analysing why trade costs remain significantly higher is paramount.

### 1.2.1 The East Africa Community (EAC)

EAC comprises the Republics of South Sudan, the United Republic of Tanzania, Kenya, Rwanda, Uganda, and Burundi, whose overall agenda is to achieve economic, social, and political integration (EAC, 2019). The EAC integration has four key pillars, i.e., Customs Union, Common Market, Monetary Union, and Political Federation. So far, the EAC has achieved the establishment of the Customs Union (CU) which provides for the elimination of customs duties and other charges of equivalent effect on imports, the removal of Non - Tariff Barriers (NTB) to trade and the establishment of a Common External Tariff (CET) which was signed in November 2004, ratified in December 2005 and became effective in January 2006; and the establishment of the Common Market (CM) which provides for the free movement of goods, labour, services, and capital which was signed in November, 2009 and became effective in July, 2010 (EAC, 2019).

**Table 1.1 Global Merchandise Trade: Exports and Imports, 2013-2018 (in US \$ million)**

Trade Flow	Exports and imports of goods and services, annual, 2005-2018 (in \$ Millions)					
	2013	2014	2015	2016	2017	2018
World	23,439,269	23,828,450	21,163,574	20,745,422	22,845,476	24,971,375
Africa	698,599	646,089	485,404	445,725	527,700	606,310
EAC	27,924	30,039	28,311	27,054	28,501	30,233
Percentage Share of Africa Trade to World Trade	2.98%	2.71%	2.29%	2.15%	2.31%	2.43%
Percentage Share of EAC Trade to Africa Trade	4.00%	4.65%	5.83%	6.07%	5.40%	4.99%

Source: UNCTADStat Database (accessed in March, 2020)

From table 1.1 above, shows that although merchandise trade in Africa continued to grow from 2.15 per cent in 2016 to 2.31 percent and 2.43 per cent in 2017 and 2018 respectively. Africa only contributes to 2% of merchandise in the global trade. However, the percentage share of EAC trade has been declining from 6.07 per cent in 2016 to 5.4 percent in 2017 and 4.99 in 2018. This declining trend is worrying given that EAC is the only fully operational customs union in Africa (AfDB, 2019).

**Table 1.2 Total intra-EAC Trade, 2014-2018 (US\$ million and percentage change)**

		2014	2015	2016	2017	2018	Percentage Change			
							2015	2016	2017	2018
<b>Imports</b>	Uganda	684.60	630.20	530.00	565.50	796.30	-8%	-16%	7%	41%
	Tanzania	709.80	278.60	298.80	243.20	302.70	-61%	7%	-19%	24%
	Kenya	416.90	407.80	324.40	589.80	676.50	-2%	-20%	82%	15%
	Burundi	169.10	151.10	157.20	151.00	134.30	-11%	4%	-4%	-11%
	Rwanda	511.00	474.10	439.80	478.60	549.10	-7%	-7%	9%	15%
	<b>Total</b>	<b>2,491.40</b>	<b>1,941.80</b>	<b>1,750.20</b>	<b>2,028.10</b>	<b>2,458.90</b>	<b>-22%</b>	<b>-10%</b>	<b>16%</b>	<b>21%</b>
<b>Exports</b>	Uganda	642.20	771.60	711.00	1,126.30	1,254.50	20%	-8%	58%	11%
	Tanzania	779.50	995.20	552.50	464.50	508.60	28%	-44%	-16%	9%
	Kenya	1,430.80	1,285.90	1,199.00	1,272.50	1,273.80	-10%	-7%	6%	0%
	Burundi	15.70	14.80	12.30	11.50	16.60	-6%	-17%	-7%	44%
	Rwanda	352.40	118.80	156.60	84.60	89.70	-66%	32%	-46%	6%
	<b>Total</b>	<b>3,220.60</b>	<b>3,186.30</b>	<b>2,631.40</b>	<b>2,959.40</b>	<b>3,143.20</b>	<b>-1%</b>	<b>-17%</b>	<b>12%</b>	<b>6%</b>
<b>Total EAC Trade Values</b>	Uganda	1,326.90	1,401.80	1,241.40	1,691.80	2,050.70	6%	-11%	36%	21%
	Tanzania	1,489.30	1,273.80	851.30	707.70	811.30	-14%	-33%	-17%	15%
	Kenya	1,847.70	1,693.70	1,523.40	1,862.30	1,950.30	-8%	-10%	22%	5%
	Burundi	184.80	165.90	169.50	162.50	150.90	-10%	2%	-4%	-7%
	Rwanda	863.40	593.00	596.40	563.20	638.80	-31%	1%	-6%	13%
	<b>Total</b>	<b>5,712.10</b>	<b>5,128.20</b>	<b>4,382.00</b>	<b>4,987.50</b>	<b>5,602.00</b>	<b>-10%</b>	<b>-15%</b>	<b>14%</b>	<b>12%</b>

Source: EAC Trade and Investment Report 2018

Regionally, from the above Table 1.2 it can be seen that intra- EAC trade values decreased by 25 per cent between 2015 to 2016 but has since rebounded by 14 per cent and 12 per cent in 2017 and 2018. This shows that the returns from trade have been inconsistent in the short-term making it important to source data over a longer period of time to establish the pattern and assess whether or not trade facilitation measures have reduced trade costs which in turn increases volume of trade.

The EAC has adopted several reforms aimed at facilitating trade including harmonization of customs procedures with standardized customs documents, single window system, establishment of One Stop Border Posts (OSBP); harmonized business hours across the

regions, instituting 24-hour operational hours in key borders stations; harmonized transport regulations and standards; and strengthened Nontariff barriers (NTBs) monitoring mechanisms through national and regional monitoring committees (WTO, 2019). Despite these efforts, high cost of intra-African trade remains the main challenge to trade in the continent (World Bank, 2020). Trade agreements such as the AfCFTA are made to provide a framework that can be adopted to reduce trade costs by removing tariffs and costs linked to non-tariff barriers and administrative procedures. The World Bank (2020) and the AfDB (2020) report that the most pronounced results from adoption of trade facilitation measures would be reduced costs of intra-African trade contributing to increased income of around 3.5 % (AfDB) or 4.5% (World Bank), while countries such as Kenya, Namibia, Cote d'Ivoire and Zimbabwe would see an income increase of up to 10%. This study discussed these issues in detail as it seeks to assess the effect of facilitation measures on cross border trade costs.

### **1.3 Statement of the Problem**

Trade facilitation is one of the tools that has been instituted to ease trade relations between countries (UNCTAD, 2016). In a recent study, WEF (2013) projected that improving border administration, improving trade infrastructure and services to just half of the optimum global standards, there would be a US\$ 1.6 trillion (14.5%) increase in global exports and US\$ 2.6 trillion (4.7%) GDP. Further, countries incur different trade costs depending on development levels, degree of industrialization, cross border procedures, connectivity and logistics. Various facilitation measures have been instituted in East Africa in attempt to improve cross-border trade in the region. The East African Countries have also integrated and efforts for the common market and free trade are underway focusing on one bloc. However, despite these measures, the share of merchandise trade volume from the region has continued to decline.

According to Arvis et al. (2013), initiatives such as regional trade agreements and improved transport connectivity boost trade performance by reducing trade costs. Arvis et al. (2013) also note that trade costs are important to increase competition and improve a country's ability to integrate into regional and global value chains. In a study by Novy (2011), it is asserted that due to data limitations and practical difficulty in including every factor that constitutes trade cost, trade figures are useful in casting the trajectory of performance. The methodology is dynamic and accounts for changes in the trade cost of a country as reflected by the patterns of trade over time. In East Africa, Mwesigye (2021) established that inappropriate national

policies, limited implementation of proposed regional and sub-regional agreements, poor transport networks development, and low-capacity building are among the drivers of high cost of regional trade.

AfDB (2020) and the World Bank (2020) assert that implementation of trade facilitation measures would see significant reduction in trade costs and promote intra-African trade. Shepherd and Duval (2014) reported cost reduction of between 20% and 45% after the adoption of paperless trade. There was also a sharp reduction in processing time and cost of submission per document after the introduction of an electronic single window for trade documents which showed that paperless trade measures resulted in reductions in labor costs, printing and delivery of documents. Duval, Utoktham and Kravchenko (2018) affirm that adoption of binding and non-binding trade facilitation measures is associated with reduced trade costs in the Asia Pacific countries, reporting an annual gain of about \$1.2 trillion.

However, to date most of the trade initiatives being implemented within the EAC region have not been sufficient in reducing trade costs (Bernhard & Eva, 2021). Further, none of the above studies have explored the relationship between GDP per capita and trade costs. This study seeks to fill this gap by investigating how approaches implemented within the East African region have influenced trade costs and how the differences in GDP per capita between the countries in the block impacts the cost of intra-country trading. This study therefore seeks to review regional initiatives on trade facilitation across borders within East Africa and assess the effects of cross border facilitation measures on trade costs.

## **1.4 Research Objectives**

### **1.4.1 General Objective**

The general objective of the research is to establish the effect of cross border trade facilitation measures on trade costs in the East Africa region.

### **1.4.2 Specific Objectives**

- i. To assess the effect of cross-border trade facilitation measures on trade costs in East African region.
- ii. To assess the control effect of GDP per Capita on the relationship between cross-border trade facilitation measures and trade costs in the East African region.

## **1.5 Research Hypothesis**

**H<sub>01</sub>** There is no significant effect of are the cross-border trade facilitation measures on trade costs in East African region.

**H<sub>02</sub>** There is no significant control effect of GDP per Capita on the relationship between cross-border trade facilitation measures and trade costs in the east African region.

## **1.6 Scope of the Study**

The study focussed on five East African Countries (Republics of Kenya, Uganda, Rwanda, Burundi and the United Republic of Tanzania). Given that most of the EAC states are import oriented, facilitation measures are key in reducing trade costs and lowering the price of goods to the final consumer. Additionally, although the Republic of South Sudan although is a member of EAC, it has been excluded in this study as it attained its independence in 2011 and only joined the treaty in August 2016 and is currently not a member of WTO. The study considered the period between 2006-2020. The unit of analysis was cross border trade costs within the EAC region where implementing trade facilitation measures is anticipated to reduce trade costs.

## **1.7 Significance of the Study**

Various stakeholders are expected to find the findings of this study useful:

### **1.7.1 Policymakers**

This study intends to review current facilitation measures and assess how these measures affect trade costs. This was of significance to policy makers as they can use the findings and recommendations of this study to inform EAC's policy direction and enable them prioritize those initiatives that will most benefit the region.

### **1.7.2 Researchers and Scholars**

The study will contribute to the body of existing knowledge on the effect of facilitation measures on cross border trade costs with a specific focus on the East Africa region. This will give a different perspective on how facilitation measures affect trade costs as most studies done on this as was highlighted in chapter two have generalized the African context. This study can be used as reference materials for future research/study related to this topic.

### **1.7.3 The EAC Member States**

As the region seeks to integrate further, the findings of this study can show Member States the benefit that will accrue to them when they implement the facilitation measures as well as show how they compare among themselves. This will enable Governments formulate strategies to further enhance cooperation in order to simplify and harmonize trade procedures and processes for economic growth and development.

### **1.7.4 Potential Investors**

This study was useful to potential investors seeking new markets within the East Africa region by providing information on the existing facilitation measures and get an insight into the initiatives being undertaken by member states to lower trade costs. This was guided in forming a decision about investing in the region.



## CHAPTER TWO: LITERATURE REVIEW

### 2.1 Introduction

This chapter discusses the various theories related to trade and trade costs; how these theories inform the study area; and reviews the existing literature from empirical studies that have been conducted related to trade facilitation. The chapter further reviews the research gap, the conceptual framework and the operationalization of the study variables.

### 2.2 Theoretical Review

A multi-theoretical approach composed of three theories was used to guide this study. These include: the theory of Comparative Advantage by David Ricardo; the Heckscher – Ohlin Model by Eli Heckschler and Bertil Ohlin; and a simple “iceberg” partial equilibrium model by Samuelson. These theories have been used to cast the importance of different facilitation measures which have been perceived significant in trade across borders in East African region. The main question remains, has cross border facilitation measures eased trade costs among countries of reference yet most of them are import-oriented countries?

#### 2.2.1 Theory of Comparative Advantage

This theory was advanced by David Ricardo in 1815 and posits that “*a country should, and under competitive conditions will, specialize in the export of the products that it can produce at the lowest relative cost.*” This implies that at least one country has specialized in producing one product which gives it the most competitive advantage. In Ricardian world of perfect good mobility, it is assumed that the price of a good has the same price in world market with the same currency. However, each country within the EAC has its own currency with varied values in the market. Basing on this perspective, the use of four principles become instrumental: 1) workers earn the value of goods they produce; 2) both goods have to be produced somewhere in the world; 3) workers move in an occupation that pays them high incomes; and 4) pricing is competitive. The inequalities stemming from these principles and location of different countries is a key reason necessitating the use facilitation measures in order to ease cross border trade costs.

The theory has been criticized because it predicts an extreme degree of specialization which is not always the case in the real world. It does not consider the resource endowment of the different countries and refuses to acknowledge the role of economies of scale in determination

of trade. Despite the stated criticisms, the basic prediction of the Ricardian model that countries mostly export goods which they produce in high quantities still holds. Furthermore, the real-world gains from trade are modified by the existence of transport costs and tariffs as determined by the terms of trade (Krugman, Obstfeld & Melitz, 2018).

Related to the study variables, this theory is relevant because in a hypothetical world without trade costs, the difference in relative prices opens up opportunities for welfare-enhancing international trade and use of facilitation measures for the case of EACs. However, when the trade procedures are not sufficiently implemented, the resulting trade costs drive a wedge in the trade relationship between two or more countries. This means that trade facilitation is key in lowering trade costs and this encourages trade between countries.

### **2.2.2 The Heckscher – Ohlin Model**

Advanced by Swedish economists, Eli Heckschler and Bertil Ohlin in 1919 (and advanced in 1933), this theory states that “*countries export the products that use their abundant factors intensively and import the products using their scarce factor intensively*”. Also known as the factor-proportions theory, the Heckscher-Ohlin Model emphasizes interplay between the proportions in which different factors of production are available in different countries and the proportions in which they are used in producing different goods (Krugman et.al, 2018).

In contrast to Ricardian model, this model assumes that the trading countries have equal capacity of production. There are two factors of production, capital and labour whose endowments vary across countries making one country capital-abundant and the other country labour-abundant. If trade is opened up and there are no trade costs, both countries produce and export more of the commodity that utilizes its abundant factor intensively but unlike in the Ricardian model, complete specialization is unlikely. Related to the study variables, this theory is relevant because it explains how economies can improve real income from its abundant factor of production through cross border facilitation measures. A reduction in trade costs leads to more specialization in the sector that exhausts the abundant factor leading to increased demand. In a scenario where the abundant factor is labour intensive, trade facilitation can make workers better (WTO, 2015).

### **2.2.3 A Simple “Iceberg” Partial Equilibrium Model**

Developed by Samuelson (1954), this model explains trade costs. It states that “when the trade procedures cease to be efficient, the cost of trade increases and this increases the difference between the production price and the purchasing price. This theory perceives this difference as similar to the loss that an iceberg undergoes as it floats while melting across the ocean. Trade costs are proportional to the value of goods shipped, but the main results will continue to hold even in cases where trade costs are additive instead.” This model is relevant to the study as it represents what trade costs are and how they relate to the study. In this case there are the obvious observable sources of trade costs such as transport costs akin to the tip of the iceberg and the unobservable trade costs such as delays in border procedures and processes. This is what is below the surface of the iceberg. This study therefore, sought to decompose these costs and how they can be reduced through trade facilitation.

## **2.3 Empirical Review**

### **2.3.1 Review of Trade Facilitation Measures and their Effectiveness**

Wilson et al. (2005) identified four distinct areas of focus in TF reforms, namely: regulatory environment, port efficiency, custom environment, and sector infrastructure. The specific TF measures center on three key premises: easing trade procedures and processes, transparency in administration and application of rules, and collaboration across the borders, especially among custom agencies and trading partners (UNCTAD, 2011). According to Park and De (2013), port efficiency is the “volume twenty-foot equivalent throughput given inputs such as cranes, berthing, and terminal space.” Port performance is important in increasing the general competitiveness of a country as well as facilitating trade by enabling traders to engage in high volumes and quality of trade. Nguyen, Chang, Chin, and Tongzon (2016) reviewed measures of port efficiency using a DEA approach across 43 Vietnamese ports. The study showed berth length, terminal capacity, warehouse capacity, cargo handling, and output are key measures of port efficiency. Efficiency of port services was noted to reduce time by reducing clearance time, thus removing costs associated with transport and storage of goods in transit. In a review of Chinese ports, Yuen, Zhang, and Cheung (2013) indicate that intra-port and inter-port competition and ownership structure predicted the level of port efficiency, which promoted trade growth. Healthy competition between ports and efficiency is associated with reduced costs associated with tariff and non-tariff barriers to trade. Schøyen and Odeck (2013) found

out that Norwegian ports could obtain better technical efficiency than other Nordic countries; however, they had under-performed in terms of scale efficiency.

Neufeld (2014), suggested that provisions in customs unions, especially where CET exists, tends to be more beneficial than a typical RTA. This is because it requires that the border procedures are harmonized and simplified even more. When TF measures are implemented, it results in significantly lower bilateral trade costs among the member countries. Balistreri et al. (2014) stated that for governments under integration to reduce trade costs effectively, there is a need for better collaboration among them. This provides information on sources of trade and provide a mechanism for regular assessment of barriers to trade and costs and provide a basis for policy formulation. Hoekman and Shepherd (2015) note that trade facilitation through reforming border procedures reduce trade costs and could significantly improve the net economic gains in terms of trade and real incomes. Kimani (2016) notes that harmonization of trade tariffs, simplifying trade procedures, sharing of information between partner states, and establishing a guiding protocol can improve the effectiveness of customs unions and ease costs associated with customs inefficiency such as corruption.

In a study conducted by Azampo (2017) on the case for RTAs and inter-country trade costs in Pacific Island Countries (PICs) on whether the PICs cross border trade cost performance was related to involvement in RTAs that have TF provisions, the World Bank trading across borders indicators were used. It was found that reviewing and strengthening TF related provisions in the RTAs and strengthening PICs capacity to implement TF obligations, and reforms are important on the cross-border trade. It was found that the review is important in informing the regional trade policy agenda and to maximize the benefits to the region. This, according to Maur and Shepherd (2011), can benefit all trading partners, not just RTA members, as transparency of trade guidelines is attributable as a public good that, once provided, benefits all trading partners, not just members of the RTA.

EAC member states established the Regional Trade Facilitation Sub-Committee to spearhead the implementation of facilitation measures decided at the regional level and ensure it converges with national implementation plans. Further, all EAC countries are members of the World Customs Organization with Rwanda, Uganda and Kenya having ratified the International Convention on the Simplification and Harmonization of Customs Procedures (revised Kyoto Convention) (WTO,2019). These finding concur with UNCTAD (2011) who

concluded that specific TF measures centre on three key premises: easing trade procedures and processes; transparency in administration and application of rules; and collaboration across the borders, especially among custom agencies and trading partners.

Implementation of the Single Customs Territory (SCT) within EAC has greatly reduced cargo delays at the borders. For instance, time taken by goods transiting from Mombasa to Kampala has reduced from 432 hours to 96 hours; Mombasa to Kigali has reduced from 504 hours to 148 hours; and Dar es Salaam to Kigali had reduced from 480 hours to 144 hours. The region further introduced the Authorized Economic Operator (AEO) program in 2015 where individuals or entities benefit from faster clearance of perceived low-risk companies by custom agencies. AEO status is granted for three years and participation is free of charge. This program grants transporters priority border clearance and exemption from using the electronic cargo tracking system (EAC, 2019). This is a step in the right direction as indicated by Balistreri et al. (2014) who stated that for governments under integration to reduce trade costs effectively, there is a need for better collaboration among them.

The EAC enacted the One-Stop Border Posts Act in 2016 which has led to the establishment of the one-stop border posts. Thirteen (13) posts are currently operational. These posts have increased efficiency in facilitating trade and movement of goods in the region. Further, the region is in the process of implementing a regional electronic single window (e-SW) to enable member states share data in order to facilitate cross-border and international trade. Kenya, Rwanda, and Uganda have already implemented the National Electronic Single Window Systems with Tanzania and Burundi at different stages of implementation (EAC,2019). Tosevska-Trpcevska (2014) showed that in Macedonia, introduction of a single-window and simplified customs procedures have greatly improved the competitiveness of the country in the market place.

Głodowska (2017) opined that a supportive business environment between member countries, improving the regulatory environment, and supporting trade reforms results in better pricing thus encouraging trade participation among the local population thus contributing to economic growth. Kodongo and Ojah (2016) note that the dilapidated infrastructure in Africa has been culpable for limited economic growth. Their study reviewed 45 Sub-Saharan Africa for the period 2000-2011 and assessed infrastructural spending. The study results show that the quality of infrastructure and access to infrastructure has resulted in improved trade competitiveness

(export diversification) and cross border flow of capital. Bensassi, Márquez-Ramos, Martínez-Zarzoso, and Suárez-Burguet (2015) view that improving transport infrastructure and logistic facilities are coupled with favorable geographical factors can be critical to trade competitiveness. In examining bilateral exports between Spanish Territories and 45 countries between 2003-2007, the study results confirm that adequate logistical infrastructure is integral to an improvement inflow of trade goods..

### **2.3.2 Effect of Trade Facilitation Measures on Trade Costs**

According to OECD (2018), trade costs arise from getting to the border (such as transport or logistics costs); crossing border such as documentation and customs compliance requirements, lengthy administrative procedures, and other delays or behind the border such as non-tariff regulatory measures, and general impediments on doing business. The OECD (2018) information supports an earlier study by Arvis et al. (2013), who identified two main sources of trade costs rising from bilateral factors between importer and exporter. These include geographical distance, transport costs, and common features such as common border, common language, and similar economic community, and those that arise from endogenous factors such as logistics performance, TF bottlenecks, connectivity, tariffs, and non-tariff measures.

Zhang and Wu (2018) examined the effects of trade facilitation measures on trade between China and countries along the Belt and Road Initiative. The study utilized time-series data for 2011-2014 and applied the gravity model to determine the impact fo TF measures on trade flows. The study revealed there is a significant relationship between trade facilitation and the level of bilateral trade. The study found out that the regulatory environment and the economic environment have an insignificant effect on the volume of trade. At the same time, port efficiency was a key predictor of increased trade flows. The study, however, does not establish the effect of selected TF measures on trade costs, which this study examines.

Fontagné, Orefice, and Piermartini (2020) reviewed the heterogeneous effect of trade facilitation measures in France. The study adopted a cross-sectional review focusing on the benefits of trade facilitation on both small and large exporters. The review of research data showed that improved information availability, automation of border formalities, lessening procedures led to an improvement in large exporters business. The study indicated that trade facilitation policies have led to an improvement in the fixed and variable costs for exporters

and increased the size of trade flows. The study is not focused on the EAC market, which the current research seeks to establish the effect of trade facilitation measures on trade costs in the region.

Feenstra and Ma (2014) research examined the link between trade facilitation and the extensive margin of exports. The study conducted a cross-sectional of several OECD countries and measured trade facilitation using port efficiency. The analysis of study data showed that port efficiency significantly affected the margin of exports, while the import tariffs between bilateral partners negatively influenced the export variety. The study findings were consistent across OECD countries without common borders. On the other hand, the results show a minimal effect of trade facilitation and margin of exports when the focus is on bilateral partners or countries with a common border. The study only focused on port-efficiency as a TF measure. The current study expanded on this gap by incorporating more TF measures. In Macedonia, Tosevska-Trpcevska (2014) showed that introducing a single-window and simplified customs procedures have greatly improved the competitiveness of the country in the market place. The findings shed more light on the aim of the current research; however, the scope of the study was OECD countries; hence does not sufficiently cover the EAC market, which is the scope of this research.

Geda and Seid (2015) conducted a study on internal trade and regional integration in Africa. The study focussed on the gap and lack of advancements in the intra-trade between African countries. The study adopted correlation analysis and the gravity model of international trade. The research revealed that lack of complementarities in imports and exports had limited the intra-Africa trade. The study also notes that poor infrastructure, productivity, and trade facilitation have characterized the African export trade. The study calls for advancement in innovative techniques that can enhance trade and further regional integration. The research, however, fails to indicate how various trade facilitation measures can influence the trade costs, which is the focus of the current study.

Sakyi, et al (2017) analyzed the effects of trade and trade facilitation on economic growth in Africa. The study employed principal component analysis to determine the effect of trade, export, and import costs. The results of the estimation provide evidence of a positive effect of the trade facilitation measures on economic growth, which is transmitted through improved

trade capacity. The study focuses on economic growth, while the current study investigated the impact of trade facilitation measures on the trade costs within the EAC region.

Moisé and Bris (2013) reviewed trade costs across 107 developing countries to determine the potential impact of trade facilitation on trade costs using estimates drawn from the UN ESCAP-World Bank Trade Cost database. The study adopted regression analysis to determine the association between trade costs against variables such as common language, distance, common border, post the introduction of the TFIs. The study found that when all TFIs were added within the same regression, the potential cost reduction was 14.5% for low-income countries, 15.5% for lower-middle-income countries, and up to 13.2% for upper-middle-income countries, underlining the importance of an all-inclusive approach to TF reforms. Such figures show that there is additional value through facilitation measures.

Owino (2017) estimated how trade facilitation would impact exports of fruits and vegetables from 15 EU countries to Kenya and asserted that trade facilitation measures geared towards simplifying customs procedures are important in improving exports and lowering costs. Madagascar, Ali, and Milner (2016) found that a country needed to lower both border and non-border trade costs by simplifying customs procedures and reducing the cost of obtaining relevant documentation.

### **2.3.3 Gross Domestic Product and Trade Costs**

Yu, Wang, Cheng and Yang (2021) used a standard gravity model to examine trade frictions between wealthy and impoverished nations and determined that trade frictions arise from wage inequality and higher cost of exporting resulting from wage inequality and poor economic and systemic development. The study showed that improved market access would result in reduced costs to trade and increased income. Williams (2021) carried out a multi-country study with the aim of determining the relationship between government size, GDP per capita and trade. The study involved panel data collected from 126 countries between 1980 and 2018. The analysis showed that among high income countries, the association between trade and government size becomes negative while the correlation becomes positive among low-income countries. The study showed that facilitating trade by reducing costs by one unit results in a 17% increase in GDP and government size. Further, the study showed that a nation's income is a key indicator of government spending and trade volumes and associated costs. The study

sought after the relationship between government spending and trade, the current study examined how trade costs are influenced by the GDP per capita of the region. Chen, Feng, Li and Lin (2021) found a positive relationship between rising housing prices and trade surpluses, asserting that in regions with stringent credit programs, the relationship between trade surpluses and rising housing prices is weaker. This study shows that housing costs and regulatory environment are also key determinants of whether countries will participate in intra-regional trade. It may also explain the reason why exports exceed imports in certain regions. This study reviewed trade surpluses while the current study attempted to associate GDP and trade costs.

Portugal-Perez and Wilson (2008) investigated the importance of trade facilitation in Africa. The study used Mauritius as the benchmark for trade facilitation and sought after the impact of reducing border-related costs, costs related with behind-the-border costs, transport costs and costs associated with compliance of regulations. The study noted a strong link between trade restrictions and poverty in Africa, reporting a sharp decline in trade costs with increased investment in road expansion, market information and credit provision, and reduction in associated regulation requirements and border-related costs. This study failed to examine the relationship between GDP and trade facilitation measures. Ouma (2014) sought after the impact of the adoption of the EAC Regional Trade Agreement on agricultural exports of member states. The study adopted panel data from UNCOMRADE, International Financial Statistics and World development indicators and carried out analysis using Augmented gravity models. The data collected was reported between 2000 and 2012 and findings showed that the two countries with the biggest GDP realized the most significant increase in agricultural exports. The study determined that increasing rural connectivity was one of the most efficient means of promoting economic integration among EAC member states. This study failed to explicitly associate the increase in country productivity with reduced trade costs but linked the increase in exports to trade liberalization efforts. The current study bridged this empirical gap.

Muthoga, et al., (2013) showed a significant increase in intra-regional trade in EAC after regional financial integration efforts. The study determined that agreeing to impose a common external tariff that applies to goods imported within member states, agreement to the principle of asymmetry in the elimination of internal tariffs, and removal of restrictions on movement of labor, harmonization of labor policies, formulation of common standards and measures for association of employers and workers, and expected adoption of a common employment policy are among the adopted initiatives that significantly reduced trade costs and encourage trade.

However, the study noted that since Kenya is the bigger economy, the country had to allow goods from Uganda and Tanzania to enter the country duty-free, while the two countries imposed tariffs on selected goods to have a sustainable balance of trade. This study did not assess how other factors such as infrastructural development impact trade costs in the region.

## 2.4 Summary of Literature and Research Gaps

In summary, the literature review shows the necessity of trade facilitation in cross border trade leading to more market demand and better prices. The empirical literature on the effects of trade facilitation measures and regional integration on trade cost is very limited. Furthermore, the studies conducted mostly generalize expected reforms within developing countries or Africa, and there is no specific study that reviews the East Africa Region. Furthermore, there are no studies that recognize the unique qualities that come with regional integration in Africa and how they can impact trade costs and how the measures implemented so far have improved costs. How these measures relate to the context of EAC leaves a gap in this study. The review of various empirical studies showed several gaps that this study would focus on solving, and a summary of the same is presented below.

**Table 2.1 Summary of Research Gaps**

Author	Title	Research Findings	Gap and Focus of Study
Feenstra and Ma (2014)	Trade facilitation and the extensive margin of exports	Port efficiency had a significant effect on the margin of exports.	The study only focused on port-efficiency as a TF measure. Current study expanded on this gap by incorporating more TF measures
Fontagné, et.al (2020)	Effect of trade facilitation measures in France	The study indicated that trade facilitation policies have led to an improvement in the fixed and variable costs for exporters	The study is not focused on the EAC market which the current research seeks to establish the effect of trade facilitation measures on trade costs in the region

Author	Title	Research Findings	Gap and Focus of Study
Geda and Seid (2015)	Potential for internal trade and regional integration in Africa	The research revealed that lack of complementarities in imports and exports had limited the intra-Africa trade.	The research, however, fails to indicate how various trade facilitation measures can influence the trade costs, which is the focus of the current study
Sakyi, et. al (2017)	Effects of trade and trade facilitation on economic growth in Africa	There is a positive effect of the trade facilitation measures on economic growth, which is transmitted through improved trade capacity	The study focuses on economic growth, while the current study investigated the impact of trade facilitation measures on the trade costs within the EAC region.
Zhang and Wu (2018)	Effects of trade facilitation measures on trade between China and countries on Belt Road Initiative	The study found out that the regulatory environment and the financial environment have an insignificant effect on trade. At the same time, port efficiency was a key predictor of increased trade flows.	The study, however, does not establish the effect of selected TF measures on trade costs, which this study reviewed.

## 2.5 Conceptual Framework

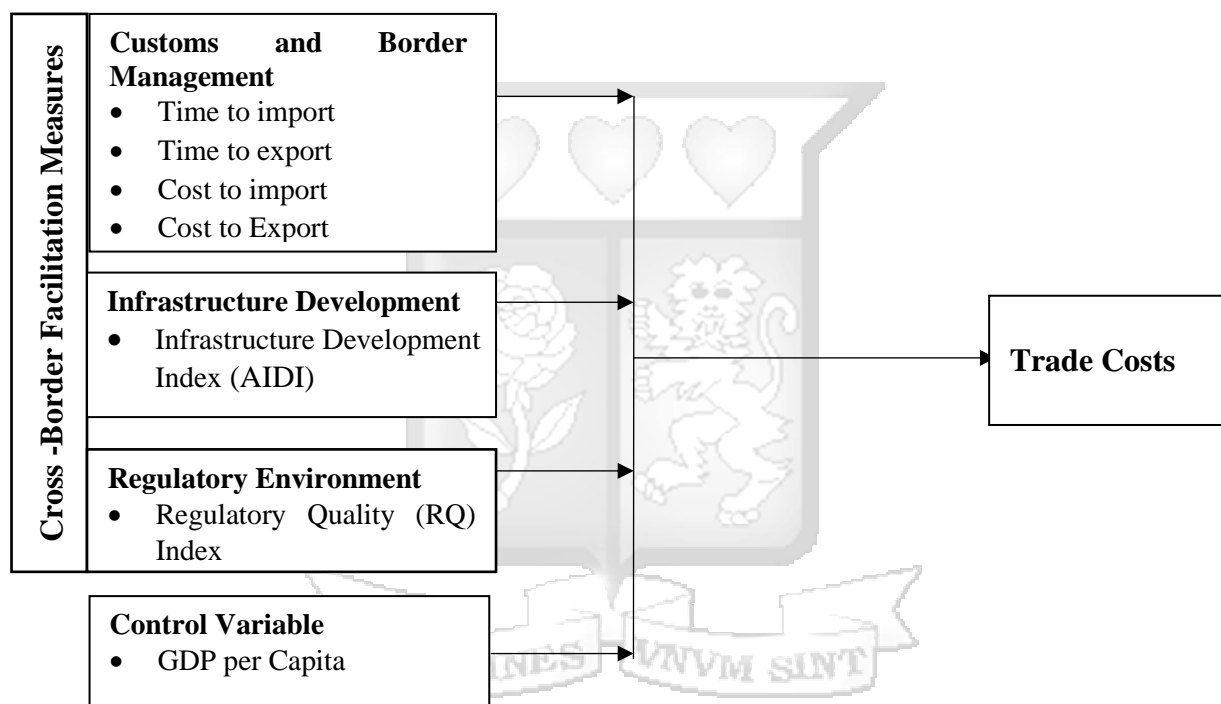
This section presents independent and dependent variables that was examined within this study. The independent variable includes facilitation measures, while the dependent variable is trade costs. Empirical studies above by Arvis et al. (2013); Moisé et al. (2011, 2013); Hoekman and Shepherd (2015), and Azampo (2017) have shown that the independent variables (namely customs and border management, infrastructure development, and regulatory environment) have an impact of reducing trade costs.

It is therefore expected that these independent variables have an inverse relationship to trade costs. This is because when these cross-border trade facilitation measures; for example, customs and border management are improved, trade costs are expected to reduce. The study had one control variables (size of the economy). Although size of the economy is not of specific interest in this research, it is a significant variable and may influence how independent variables influence the dependent variables and, therefore, was maintained in the study.

The conceptual framework is diagrammatically presented as follows:

**Independent Variables**

**Dependent Variable**



*Figure 2.1 Conceptual Framework*

Source: Author (2020)

**2.5.1 Operationalization of the Variables**

Trade costs are all costs incurred in getting a final good to a final user other than the cost of producing the good itself (Portugal-Perez & Wilson, 2008). This study will adopt the average international trade cost as computed by UNESCAP-World Bank Trade Costs Database. These measures were used in the study by Portugal-Perez and Wilson (2008) in their study on why trade facilitation matters to African countries.

Customs and Border Management was measured using: Time taken to export and import which measures the number of hours taken to complete documentary and border compliance procedures; and cost for exports and imports which measures the cost involved in importing or exporting a 20-foot container in USD respectively. This measure assesses the documentary and border compliance costs. It is expected as trading time reduces, trade cost also reduces.

Infrastructure Development was measured using the Africa Infrastructure Development Index (AIDI) developed by AfDB to monitor Africa’s progress in infrastructure development (AfDB, 2018). The Regulatory Environment which relates to a country’s institutional issues and policy was measured using the Regulatory Quality Index (RQ). RQI is an indication of the ability of the government to formulate and implement sound policies and regulations thus enabling development in the private sector

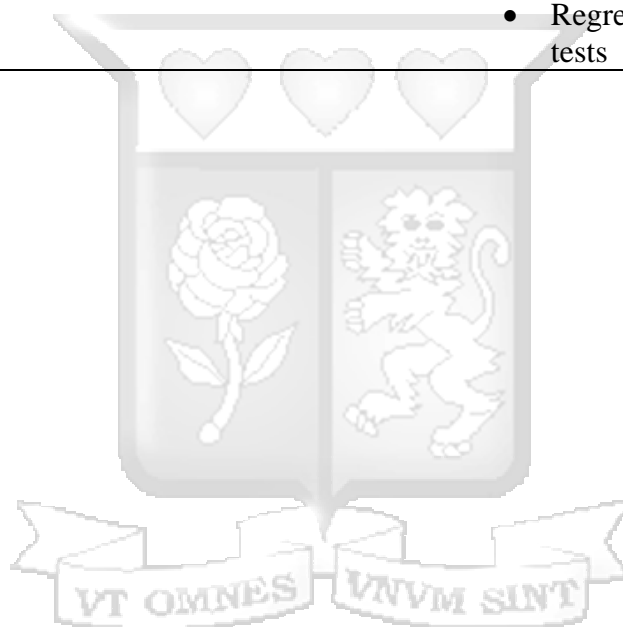
The control variable (size of the economy) was measured by the Gross Domestic Product per Capita (GDPPC). A higher per-capita income is associated with a better trade infrastructure and less behind-the-border restrictions thereby reducing trade cost (Busse et al, 2012).

The study variables was operationalized as follows in Table 2.2

**Table 2.2 Operationalization of Study Variables**

<b>Variable</b>	<b>Constructs</b>	<b>Measurement</b>	<b>Data Analysis</b>	<b>Previous Research</b>
<b>Customs and border management</b>	<ul style="list-style-type: none"> <li>• Time to import</li> <li>• Time to export</li> <li>• Cost to import</li> <li>• Cost to export</li> </ul>	<ul style="list-style-type: none"> <li>• Trading time</li> <li>• Costs of 20-ft container import/export</li> </ul>	<ul style="list-style-type: none"> <li>• Sums and means</li> <li>• Correlations</li> <li>• Regression tests</li> </ul>	<ul style="list-style-type: none"> <li>• Novy (2009)</li> </ul>
<b>Infrastructure development</b>	<ul style="list-style-type: none"> <li>• Infrastructure development index</li> </ul>	<ul style="list-style-type: none"> <li>• Africa Infrastructure Development Index</li> </ul>	<ul style="list-style-type: none"> <li>• Sums and means</li> <li>• Correlations</li> <li>• Regression tests</li> </ul>	<ul style="list-style-type: none"> <li>• AfDB (2018)</li> </ul>
<b>Regulatory environment</b>	<ul style="list-style-type: none"> <li>• Regulatory Quality Index</li> </ul>	<ul style="list-style-type: none"> <li>• RQ index</li> </ul>	<ul style="list-style-type: none"> <li>• Sums and means</li> <li>• Correlations</li> </ul>	<ul style="list-style-type: none"> <li>• Weerahewa (2009)</li> </ul>

Variable	Constructs	Measurement	Data Analysis	Previous Research
			<ul style="list-style-type: none"> <li>Regression tests</li> </ul>	
<b>Control Variable</b>	<ul style="list-style-type: none"> <li>Size of the economy</li> </ul>	<ul style="list-style-type: none"> <li>GDP per capita</li> </ul>	<ul style="list-style-type: none"> <li>Sums and means</li> <li>Correlations</li> <li>Regression tests</li> </ul>	<ul style="list-style-type: none"> <li>Busse et al. (2012)</li> <li>EAC data figures</li> </ul>
<b>Trade Costs</b>	<ul style="list-style-type: none"> <li>Average trade costs</li> </ul>	<ul style="list-style-type: none"> <li>Costs of trade</li> </ul>	<ul style="list-style-type: none"> <li>Sums and means</li> <li>Correlations</li> <li>Regression tests</li> </ul>	<ul style="list-style-type: none"> <li>Portugal-Perez and Wilson (2008)</li> </ul>



## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter described the procedures that the researcher intended to follow in collecting and analyzing data. It defined the research design, data collection approaches, analysis and reporting as well.

### **3.2 Research Philosophy**

The study was underpinned by positivism, a research philosophy that rose in the academic arena following Auguste Comte, the French philosopher who believed in the ability to make observations about reality (Grix, 2004). According to Cohen et al. (2007), Comte's position lead researchers to a general doctrine of thinking that genuine knowledge can be observed and be experimented upon. Supporters of this theory like Blaikie (2010), assumed that reality is fixed, directly measurable, and knowable and there is just one truth, one external reality. It is with this assumption that this study uses positivism emphasizing that cross border facilitation measures are directly measurable to trade costs.

### **3.3 Research Design**

The study utilized a descriptive research design in which quantitative approach was applied. According to Saunders et al. (2016), this approach studies how variables relate, and measures them numerically using various statistical and graphical techniques. The study selected the descriptive approach as it suitable when implementing a quantitative approach in determining the interaction between study variables. The study reviewed facilitation measures across EAC partner states and assessed the effect of customs and border management, infrastructure development and regulatory environment on trade costs.

### **3.4 Population and Sampling**

The study focused on all facilitation measures identified in the study within the East African Countries of Kenya, Uganda, Tanzania, Burundi and Rwanda. South Sudan was left out as it had not ratified most of the measures stemming from WTO and within the EAC. The study relied on panel data for the period 2006-2020.

### 3.5 Data Collection Methods

The study collected data for the period 2006-2020 obtained from UNESCAP-World Bank Trade Costs Database (Trade Costs), UN Comtrade database (Facilitation Measures), the World Bank (GDPPC), World Development Indicators (RQI), African Development Bank (AIDI) and East Africa Community (Trade Costs). This was secondary data since all the data used in the study was published online by these international organizations. The study data was collected using a data extraction form for the individual countries.

### 3.6 Data Analysis

The data collected was analyzed using quantitative analysis techniques. This according to Saunders et. al (2016) allowed the researcher to study, present, explain and scrutinize the relationships between facilitation measures and trade costs. The study applied both descriptive and inferential analysis techniques. The descriptive statistics included means, sum, standard deviation and frequencies. The study conducted tests for linear regression assumptions prior to conducting inferential analysis. The inferential statistics was analyzed using correlation and panel regression analysis. The study applied Pearson correlation analysis to determine the linear relationship between the independent variables and the average trade costs within the region. The analyzed research data was presented using tables and charts as applicable. The research adopted the following regression;

$$TC_{it} = \beta_0 + \beta_1 \ln XTime(TX)_{it} + \beta_2 \ln MTime(TM)_{it} + \beta_3 \ln XCost(CX)_{it} + \beta_4 \ln MCost(CM)_{it} + \beta_5 \ln AIDI_{it} + \beta_6 \ln RQI_{it} + \beta_7 \ln GDPPC_{it} + \epsilon_{it} \dots \text{Equation 1}$$

**Where:**

$TC_{it}$  is the average trade cost for country  $i$  in year  $t$ ;  $Xtime_{it}$  is the time to export for country  $i$  in year  $t$ ;  $Mtime_{it}$  is the time to import for country  $i$  in year  $t$ ;  $Xcost_{it}$  is the cost to export for country  $i$  in year  $t$ ;  $Mcost_{it}$  is the cost to import for country  $i$  in year  $t$ ;  $AIDI_{it}$  is the Africa Infrastructure Development Index for country  $i$  in year  $t$ ;  $RQI_{it}$  is the Regulatory Quality Index for country  $i$  in year  $t$ ;  $GDPPC_{it}$  is the Gross Domestic Product Per Capita for country  $i$  in year  $t$ ;  $\beta_0$  is the intercept;  $\beta_1 - \beta_7$  are regression coefficients; and  $\epsilon_{it}$  is the error term.

This model is adopted from various studies (Banik and Gilbert (2008); Njinkeu et.al. (2008); Weerahewa (2009); and Susetyo and Handonyo (2016) and modified as per the study variables and units of measurement.

### **3.6.1 Estimation method**

This study used panel data analysis which can be estimated using three methods: Pooled Least Square which combines cross section and time series data while disregarding individual dimensions; Fixed Effects Model which uses dummy variables to capture the change in the intercept between individuals and across time while assuming that the regression coefficient remains between the cross section and across time; and Random Effects Model which uses error term to correct interconnected variables across time (Susetyo & Handonyo, 2016). A Hausman test was carried out to determine the most suitable model to adopt. The test uses a null hypothesis that the preferred model is the random effect model. A Chi-square statistic p-value of the Hausman test less than 0.05 would imply that the preferred model is the random effect model (Torres-Reyna, 2007).

### **3.6.2 Diagnostics Tests**

#### **3.6.2.1 Heteroscedasticity Tests**

The study performed various diagnostics tests before conducting panel regression to ensure the minimum assumptions are observed. The study conducted heteroscedasticity tests which helps to indicate whether the random error term from a multiple linear regression must have constant variances. The study employed the Breusch-Pagan Lagrange multiplier (LM) tests. The tests indicate that if P-value < 0.05, there is presence of non-uniform variance.

#### **3.6.2.2 Collinearity Tests**

The study conducted collinearity tests which checks if there is presence of correlation among the independent variables. The research adopted the Variance Inflation Factors which as a standard, if it is below a value of 10 there is no multicollinearity problem.

#### **3.6.2.3 Stationarity Tests**

The research applied stationarity tests to check for the presence of a unit root in the variables. The study adopted the Levin, Lin and Chu test. If P-value < 0.05, there is no unit root, implying that the variable is stationary.

#### **3.6.2.4 Normality Tests**

Normality test was conducted to deduce whether the research data met the normal distribution assumption. If the sample is normally distributed, the population from which it came was normally shaped and one could assume normality in the research data. The study employed the Shapiro-Wilk test to check on the fit of the observations within the normality curve.

#### **3.6.2.5 Autocorrelation Tests**

The study also conducted autocorrelation tests to check if the residuals of the models are not auto correlated (*in other terms it checks for independence of error terms, which implies that observations are independent*). The research utilized the Durbin Watson (DW) test. The study used the criteria where scores between 1.5 and 2.5 indicate independent observations.

#### **3.6.2.6 Cointegration Tests**

Cointegration refers to situation where the variables exhibit a long-run relationship. According to Osborne and Waters (2002), two variables can drift in the short run but move together in the long run. Cointegration is essential for capturing the symmetry association among non-stationary variables in a stationary model (Pedroni, 1999). The study carried out cointegration procedure using Johansen cointegration test to assess for long run relationship between the study variables. Johansen test was preferred due to its ability to test for multiple cointegration equations among the study variables.

### **3.7 Research Quality**

To ensure reliability of the study results, inferential statistics were applied. Coefficient of determination (R-squared) was used to make inferences of the study findings and analyse the predictive power of the independent study variables. This enabled the researcher draw conclusions on the effect of cross border facilitation measures on trade costs. The Hausman test was used to determine the most appropriate model to adopt to analyse the panel data. Credibility of the research was also be a key consideration and the researcher obtained all secondary data from reputable institutions such as the World Bank and Africa Development Bank. This ensured that all the variables were assessed using standard metrics applied globally and that the credibility of the research data was ascertained.

### 3.8 Ethical Consideration

Before the research is conducted, the researcher ensured that proper Authority was granted from the School of Graduate Studies as well as National Commission for Science, Technology and Innovation. The paper was also subjected to ethical review by the Strathmore University Institutional Ethical Review Committee and approval granted. Honesty and integrity was maintained throughout the research process. The results of the study was presented and interpreted objectively.



## CHAPTER FOUR: PRESENTATION OF RESEARCH FINDINGS

### 4.1 Introduction

This chapter presented the findings of the data analysis. The section presented the summary of the descriptive analysis, the correlation tests, the diagnostic tests adopted as well as specification test. The section also presented panel regression results and cointegration tests.

### 4.2 Summary of Descriptive Statistics

The study sought to establish the effect of cross border trade facilitation measures on trade costs in the East Africa region. The study relied on panel data that was collected for the period 2006-2020. The extracted research data was coded into Stata 15 and the summary of the results is shown in this section. The study applied descriptive statistics such as means, deviation, skewness, kurtosis, maximum and minimum.

**Table 4.1 Country Specific Statistics**

Variable	Obs.	Burundi	Kenya	Rwanda	Tanzania	Uganda
<b>Time to export</b>	75	701.27	475.53	670.07	419.20	575.27
<b>Time to import</b>	75	1,060.13	584.93	839.33	719.60	708.13
<b>Cost to export</b>	75	3,209.40	2,107.40	2,271.27	1,655.40	2,691.53
<b>Cost to import</b>	75	5,614.60	2,438.67	3,179.87	2,014.67	3,511.93
<b>AIDI</b>	75	14.53	18.15	18.23	9.89	16.82
<b>RQ Index</b>	75	(0.99)	(0.24)	(0.12)	(0.45)	(0.23)
<b>GDPPC</b>	75	247.07	1,239.18	671.23	862.58	723.37
<b>Average Trade Cost</b>	75	233.24	136.91	218.48	144.92	169.27

*Source: Research Data (2021)*

From the data collected, we find that on average, Tanzania exporters take only 419.2 hours to export compared to 475.53 hours for Kenya; 575.27 hours for Uganda; 670.07 hours for Rwanda; and 701.27 hours for Burundi. Similarly, it costs US \$1,655.40 to export a 20-foot container from Tanzania compared to US \$2,107.40 from Kenya, US \$2,271.27 from Rwanda; US \$2,691.53 from Uganda; and US \$3,209.40 from Burundi. For imports, it takes importers 584.93 hours to import to Kenya; 708.13 hours to Uganda; 719.60 hours to Tanzania; 839.33 hours to import to Rwanda and 1,060.13 hours to import to Burundi. Additionally, it costs US

\$2,014.67 to import a 20-foot container to Tanzania, US \$2,438.67 to Kenya; US \$3,179.87 to Rwanda; US \$ 3,511.93 to import to Uganda; and US \$5,614.60 to Burundi. This variation can be attributed to the various reforms undertaken by individual countries to ease trade within its borders. Burundi however, did not perform well on these indicators.

In terms of infrastructure development, Rwanda leads in this area with an index of 18.23 compared to 18.15 in Kenya; 16.82 in Tanzania; 14.53 in Burundi and 9.89 in Tanzania. The index which comprises transport indicators (total paved roads and roads network); net electricity generation, total phone subscriptions and number of internet users; and water and sanitation shows how focusing on infrastructural development can grow performance across the sectors including trade. The regulatory environment was measured by RQI which ranges from -2.5 (worst) to + 2.5 (best) and shows a country's ability to formulate and implement policies that promote the growth of the private sector. Rwanda is leading in this area with an average index of -0.12 followed by Uganda with -0.23; Kenya with - 0.24; Tanzania with - 0.45; and Burundi with -0.99 respectively.

Kenya has the highest average GDP per capita at US \$ 1,239.18, followed by US \$862.58 in Tanzania; US \$723.37 in Uganda; US \$671.23 in Rwanda and US \$247.07 in Burundi. Similarly, the average trade cost in US \$136.91 in Kenya; US \$144.92 in Tanzania; US \$169.27 in Uganda; US \$218.48 in Rwanda and US \$233.24 in Burundi. This could imply a direct relationship between GDP per capita and average trade costs.

**Table 4.2 Summary Statistics**

<b>Variable</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Min</b>	<b>Max</b>	<b>Skew</b>	<b>Kurtosis</b>
<b>Time to export</b>	75	568.27	364.59	35.00	1,440.00	0.18	(0.78)
<b>Time to import</b>	75	782.43	490.02	122.00	2,280.00	1.09	1.00
<b>Cost to export</b>	75	2,387.00	1,730.71	259.00	6,742.00	0.45	(0.66)
<b>Cost to import</b>	75	3,351.95	2,444.95	403.00	11,894.00	1.19	1.55
<b>AIDI</b>	75	15.52	4.94	5.27	26.09	0.18	(0.37)
<b>RQ Index</b>	75	(0.40)	0.35	(1.24)	0.25	(0.74)	0.15
<b>GDPPC</b>	75	748.69	379.76	167.38	1,838.21	0.70	0.74
<b>Average Trade Cost</b>	75	180.56	38.77	136.91	233.24	0.25	(1.70)

*Source: Research Data (2021)*

Regionally, the study findings show that it took averagely 568.3 hours to export from the region and costed US \$2,387 and 782.4 hours to import at an average cost of US \$3,352. These results implied that the region experienced higher importation costs relative to the exportation costs. Examining the infrastructure development index, the study finds that the region averaged 15.524 compared to other regions in Africa such as North Africa which averaged above 60 in the index. However, the region has witnessed an improvement of the index over time with future improvement expected as the region advances in infrastructural development. The results also indicated that on average the RQI was -0.40. With the index being so low (in the negative) for all the countries, there still exist weaknesses in how the various partner state governments are formulating and implementing policies that can boost economic growth and development. The results also shows that the average GDP per Capita is US \$748.69 in the region and the average trade cost is US \$180.56. which is high compared to average trade cost in East Asia of US \$98.

### 4.3 Correlation Analysis

The study sought to determine the effect of the various trade facilitation measures on trade costs. The research applied correlation analysis at 95% confidence interval to ascertain the significance of the correlation between the variables. The correlation matrix is presented below;

**Table 4.3 Correlation Results**

		Average Trade Cost
Time to Export	<i>Cor. Coeff.</i>	0.3510*
	<i>Sig. level</i>	0.0029
Time to Import	<i>Cor. Coeff.</i>	0.3514*
	<i>Sig. level</i>	0.0029
Cost to export	<i>Cor. Coeff.</i>	0.1781
	<i>Sig. level</i>	0.1403
Cost to import	<i>Cor. Coeff.</i>	0.3676*
	<i>Sig. level</i>	0.0017
AIDI	<i>Cor. Coeff.</i>	0.1565
	<i>Sig. level</i>	0.1958
RQI	<i>Cor. Coeff.</i>	-0.3365*
	<i>Sig. level</i>	0.0044
GDPPC	<i>Cor. Coeff.</i>	-0.8249*
	<i>Sig. level</i>	0.0000
Average Trade Cost		1.000

Source: Research Data (2021)

The results above affirmed that testing at 5% significance level, time to export and time to import had a weak positive linear relationship with the average trade costs ( $r = 0.3510^*$ ,  $r = 0.3514^*$ ) respectively. The findings also showed that cost to import had a weak positive linear relationship ( $r = 0.3676^*$ ,  $\text{Sig. } 0.001 < .05$ ) with the average trade costs. The study outcome also indicated that regulatory quality index had a weak negative relationship with the average trade costs ( $r = -0.3365^*$ ,  $\text{Sig. } 0.004 < .05$ ). Findings showed that GDP per capita had a negative linear relationship with the average trade cost ( $r = -0.8249^*$ ,  $\text{Sig. } 0.000 < .05$ ).

#### 4.4 Diagnostic Tests

Diagnostic tests were conducted in this study to ensure data was well distributed. Prior to running a regression model, several diagnostic tests were conducted. This was performed to avoid spurious regression results from being obtained. The results of the study are presented in this section.

##### 4.4.1 Heteroscedasticity Tests

Heteroscedasticity occurs when the variance of the error terms differs across observations. This study used Breusch Pagan test to detect the presence of heteroscedasticity. The study employed the Breusch-Pagan Lagrange multiplier (LM) tests.

##### Table 4.4 Heteroscedasticity Results

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Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

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Ho: Constant variance

Variables: fitted values of Average Trade costs

**chi2(1) = 2.48**

**Prob > chi2 = 0.112**

---

*Source: Research Data (2021)*

The fitted model (Average trade costs) results indicated and  $\text{Prob} > \text{chi}2 = 0.112$  which was significant at five percent level. This is an indication of a constant variance and no problem of heteroscedasticity.

#### 4.4.2 Multicollinearity Tests

In this study, Multicollinearity was tested using Variance Inflation Factor (VIF). The rule of thumb is that a VIF of less than 10 ( $VIF \leq 10$ ) indicate no multicollinearity while a VIF of more than 10 ( $VIF \geq 10$ ) indicates a multicollinearity problem.

**Table 4.5 Collinearity Tests**

Variable	VIF	1/VIF
Time to Export	6.25	0.160
Time to Import	9.58	0.104
Cost to export	7.38	0.136
Cost to import	6.37	0.157
AIDI	1.55	0.647
RQI	2.46	0.407
GDPPC	2.45	0.408
<b>Mean</b>	<b>5.149</b>	

*Source: Research Data (2021)*

The above results are an indication that there were no multicollinearity problems within the study variables as shown by VIF values that are less than 10. The mean  $VIF = 5.149$  signifies that overall, the predictor models utilized in the panel regression had no interdependency.

#### 4.4.3 Stationarity Tests

The research conducted stationarity tests using the Levin Lin Chu (LLC) - Unit root test to ensure that the series were stationary and check the problem of having a spurious regression. The summary of the LLC results is presented in the table below.

**Table 4.6 Stationarity Results**

Variable	LLC Test	Statistics	P-Value
Time to export	Unadjusted t	-4.7427	0.0000
	Adjusted t*	-4.5304	0.0000
Time to Import	Unadjusted t	-4.6514	0.0000
	Adjusted t*	-4.4433	0.0000
Cost to export	Unadjusted t	-3.7372	0.0001
	Adjusted t*	-3.5694	0.0002

Variable	LLC Test	Statistics	P-Value
Cost to import	Unadjusted t	-4.9227	0.0000
	Adjusted t*	-4.6976	0.0000
AIDI	Unadjusted t	3.9171	1.0000
	Adjusted t*	3.7313	0.9999
Regulatory Quality Index	Unadjusted t	-2.0835	0.0001
	Adjusted t*	-2.0379	0.0001
GDPPC	Unadjusted t	-2.7984	0.0002
	Adjusted t*	-2.3444	0.001
Average trade costs	Unadjusted t	-8.6845	0.0000
	Adjusted t*	-2.6931	0.0000

*Source: Research Data (2021)*

From the study results it was evident that The Levin, Lin & Chu  $t^*$  statistic was significant at 5% level of significance thus we accept the null hypothesis that study constructs exhibited stationarity. Therefore, we reject the null hypothesis that the variables have a unit root.

#### 4.4.4 Normality Tests

The study conducted normality tests of the residuals using the Shapiro-Wilk test. Since the observations were less than 2000, the study utilized the test given that it is robust and more suitable in panel data.

**Table 4.7 Normality Results**

Variable	Obs	Prob>z
<b>Time to export</b>	75	0.002
<b>Time to import</b>	75	0.000
<b>Cost to export</b>	75	0.000
<b>Cost to import</b>	75	0.000
<b>AIDI</b>	75	0.001
<b>RQ Index</b>	75	0.001
<b>GDPPC</b>	75	0.001
<b>Ave Trade Cost</b>	75	0.000

*Source: Research Data (2021)*

$H_0$ : The data is not normal.

$H_{a1}$ : The data is normal.

The results above showed that the variables were normal given that the p-values are 0.000 which are below 0.05 for all the variables and thus we reject the null hypothesis ( $H_0$ ) and accept the alternative hypothesis ( $H_{a1}$ ). Therefore, the observations assume a normal distribution.

#### 4.4.5 Autocorrelation Tests

The research utilized the Durbin Watson (DW) test. The study used the criteria where scores between 1.5 and 2.5 indicate independent observations.

**Table 4.8 Autocorrelation Results**

Weighted Statistics
F test that all $u_i = 0$ : $F(4,65) = 7023.91$ Prob > Durbin-Watson = 2.16 F = 0.0000

*Source: Research Data (2021)*

The results above show a Durbin-Watson = 2.16 which is less than 2.5 indicating there was no serial correlation in the model.

#### 4.4.6 Johansen Cointegration Test

The study utilized Johansen cointegration test to assess for long run relationship between the study variables. Johansen test was preferred due to its ability to test for multiple cointegration equations among the study variables.

**Table 4.9 Cointegration Test Results**

Sample: 2006-2020  
 Included observations: 70  
 Trend assumption: Linear deterministic trend (restricted)  
 Series: Average Trade costs TX TM CX CM AIDI RQI  
 Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.723511	114.4394	88.8038	0.000
At most 1 *	0.70535	73.30078	63.8761	0.006
At most 2	0.365295	34.19782	42.91525	0.279

Trace test indicates 2 cointegrating equations at the 0.05 level

\* Denotes rejection of the hypothesis at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.723511	41.13867	38.33101	0.023
At most 1 *	0.70535	39.10296	32.11832	0.006
At most 2	0.365295	14.54704	25.82321	0.675

Max-eigenvalue test indicates 2 cointegrating equations at the 0.05 level

\* Denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

*Source: Research Data (2021)*

The study utilized Akaike information criterion (AIC) among other Criteria in determining the lag length. The above results from the Trace Test and the Maximum Eigen value indicate there are at least two cointegrating equations testing at 5% significance level. Therefore, it is confirmed that there exists a long-term relationship between the average trade costs and the predictor variables (time to export, time to import, cost to import, cost to export, infrastructure development index, regulatory quality index and GDP per Capita).

#### 4.4.7 Trend Analysis

The research further conducted trend analysis to investigate how the study variables evolved over the time period of the research. The study applied non-parametric test to determine the trend test across the ordered groups. The trend supported the detection of any existing or non-existing significant increasing or decreasing trends in a data series. The results are presented in table 4.10 below.

**Table 4.10 Trend Test Across Variables**

Variable	Trend Statistics
. nptrend AverageTradecosts, by (TX)	z = 2.34 Prob >  z  = 0.019
. nptrend AverageTradecosts, by (TM)	z = 2.66 Prob >  z  = 0.008
. nptrend AverageTradecosts, by (CX)	z = 1.98 Prob >  z  = 0.047
. nptrend AverageTradecosts, by (CM)	z = 3.74 Prob >  z  = 0.000

Variable	Trend Statistics
. nptrend AverageTradecosts, by (AIDI)	z = 0.28 Prob >  z  = 0.783
. nptrend AverageTradecosts, by (RQI)	z = -3.88 Prob >  z  = 0.000
. nptrend AverageTradecosts, by (GDPpc)	z = -6.97 Prob >  z  = 0.000

*Source: Research Data (2021)*

The above findings illustrate a significant positive trend between the time to export, time to import, cost to export and cost to import as indicated by  $\text{Prob} > |z| < .05$  thus indicating statistical significance. Results also established that the trend between average trade costs and the regulatory quality index and GDP per capita had significant and decreasing trend as supported by the  $\text{Prob} > |z| < .05$ . Lastly, Africa Infrastructure Development index had an insignificant trend against the average trade costs  $\text{Prob} > |z| > .05$ .

#### 4.5 Specification Tests

The Hausman test statistic is a transformation of difference between the parameter estimates from fixed effects and random effects estimation that becomes asymptotically  $\chi^2$  chi-square distributed under null hypothesis.

**Table 4.11 Hausman Test Results**

Variable	(b) fe	(b) re	(b-B) Difference	sqrt(diag(V_b- V_B)) S.E.
Time to export	0	.01262	-.01262	.05808
Time to import	0	-.00783	.00783	.03383
Cost to export	0	-.00176	.00176	.00981
Cost to import	0	.00096	-.00096	.00664
AIDI	0	4.77533	-4.77533	3.82556
RQ Index	0	-2.66521	2.66521	42.74879
GDPPC	0	-.10495	.10495	.06766

chi2(6) = (b-B)'[(V\_b-V\_B)^(-1)](b-B) = 3.38  
 Prob>chi2 = 0.7599

*Source: Research Data (2021)*

The Hausman test is distributed as chi-square with 1 degree of freedom. From the results above the probability of the cross section random effects was 0.7599, which is greater than 0.05 implying that it is appropriate to adopt random effects model. Hence the study estimated a panel regression using the random effects model.

#### 4.6 Panel Regression Analysis

The null hypothesis  $H_{01}$ : There is no statistically significant effect of cross border trade facilitation measures on the trade costs in East Africa. The study adopted a random regression estimation and the results are presented below.

**Table 4.12 Panel Regression Trade Facilitation Measures and Trade Costs**

Variable	Coefficient	Std. Error	z	P> z
Time to export	.0126	.0216	0.58	0.560
Time to import	-.0078	.0121	-0.65	0.518
Cost to export	-.0017	.0038	-0.47	0.640
Cost to import	.0009	.0025	0.38	0.701
AIDI	4.7753	.4933	9.68	0.000
RQ Index	-2.6652	8.5520	-0.31	0.755
GDPPC	-.1049	.0082	-12.73	0.000
_cons	183.7596	11.4276	16.08	0.000
Weighted Statistics				
R-sq:	Wald chi2(7) = 347.83			
within =	0.0000	Prob > chi2 =		0.000
between =	0.9087			
overall =	0.8487			

**Source:** Research Data (2021)

The study results yielded an overall R-squared of 0.8487 which indicated that 84.87% of changes in average trade costs within East African region can be determined by the cross-border facilitation measures. The Wald-tests results showed there was a positive and significant relationship between cross border facilitation measures and trade costs (Wald chi2(7) = 347.83 Prob > chi2 = 0.000). The findings further showed an insignificant effect of the main facilitation measures time to export, time to import, cost to export and cost import on the average trade

costs. This was an indication that the trade facilitation measures implemented within the region have not had a predictive power on the trade costs within the considered study period.

The results further indicate that Africa Infrastructure Development Index has a positive and significant effect on average trade costs within East African region (Coef. = 4.7753, Prob > chi2 = 0.000). This implies that as infrastructure development improves, the cost of trade will likely go down. The GDP per capita had a negative and significant effect on the average trade costs (Coef. = -.1049, Prob > chi2 = 0.000) meaning that as the size of the economy grows, the standards of living also improve and this will reduce the overall trade costs.

#### **4.7 Summary**

The study adopted a quantitative research approach with panel data being collected for the period 2006-2020. The observations were deemed adequate for panel regression to be applied in the examination. The correlation test established that time to export and time to import had a weak positive and significant effect on the average trade costs. The findings also showed that cost to export had a weak and insignificant positive effect on average trade costs while cost to import had a weak and significant positive effect on the trade costs. The study outcome also indicated that regulatory quality index had a negative and significant effect on average trade costs while GDP per capita had a strong negative effect on the average trade cost.

The panel regression results established that trade facilitation measures and GDP per capita account for 84.87% of the variations in average trade costs within the region. The findings are consistent with Neufeld (2014), who suggested that applying trade facilitation measures can significantly lead to lower trade costs among members states. This is further supported by Balistreri et al. (2014) who opined that in an effort to reduce trade costs nations need to collaborate better through elimination of trade barriers and fostering supportive policies. Moisé and Bris (2013) also showed that trade facilitation measures have been integral in reducing trade costs within low and middle-income countries.

## **CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter presented the discussion of the findings in line with the empirical literature, the conclusions drawn from this study and the recommendations made by the researcher. The study further recommends areas for further research.

### **5.2 Discussions**

This section discusses the study findings based on the research objectives of assessing the effect of cross border trade facilitation measures on trade costs in East African region. The study further examined the control effect of gross domestic product per capita on the association between trade facilitation measures and the average trade costs in EAC region.

#### **5.2.1 Effect of cross border trade facilitation measures on trade costs in East African region**

The study regression results yielded an overall R-squared of 0.8487 which indicated that 84.87% of changes in average trade costs within East African region can be determined by the cross-border facilitation measures.

The regression findings further showed that time to export and import as well as cost to export and cost to import had an insignificant influence on the average trade costs. These findings can be attributed to the overall poor performance in the region on these measures as presented in the trading across borders indicator in the ease of doing business report. In the report, Burundi is ranked at 169 out of 190 economies; Kenya at 117; Rwanda at 88; Uganda at 121; and Tanzania at 182 (World Bank, 2020). This shows there still exists a challenge in customs and border management in the region. Madagascar, Ali, and Milner (2016) who established that lower trade costs can be attained by reducing the costs of obtaining relevant trade documentation and simplifying the processes; and Kimani (2016) who noted that harmonization of trade tariffs, simplifying trade procedures, sharing of information between partner states, and establishing a guiding protocol can improve the effectiveness of customs unions.

The research regression findings established that the regulatory quality index had an insignificant effect on the region's average trade costs. These findings are consistent with

Zhang and Wu (2018) who found that the regulatory environment and the economic environment have an insignificant effect on trade. However, these findings contradict Głodowska (2017), who opined that implementing a conducive business environment through fostering the regulatory environment through effective policies and enacting reforms can be a significant contributor to economic output. These results are in tandem with observations made by Azampo (2017) who found that reviewing and strengthening TF related provisions in the RTAs and strengthening Pacific Island Countries (PICs) capacity to implement TF obligations, and reforms are important in informing the regional trade policy agenda and to maximize the benefits to the region.

The regression results indicated that the infrastructure development index had a positive and significant influence on the average trade costs within the region (Coef. = 4.7753, Prob > chi2 = 0.000). The results showed that improving infrastructure development could lower average trade costs. The above results agrees with Bensassi et.al (2015), who indicated that ensuring nations enhance their infrastructure quality and enhancing their logical facilities can be a key factor in fostering trade competitiveness. Although the region has seen an improvement in its infrastructure development, the growth relative to other countries in Sub-Saharan Africa has been slow and this could be factor into the overall trade cost. This can be a game changer for the region if fully implemented. Further, Busse et al. (2012) argued that increased infrastructural development and better GDP growth are associated with a reduction in overall trade costs within a nation.

### **5.2.2 Gross Domestic Product and Average Trade Costs**

The regression results of the study also showed that GDP Per Capita had a significant and negative influence on the average trade costs (Coef. = -.1049, Prob > chi2 = 0.000). This indicated that changes in the GDPPC would lead to a reduction in the average trade costs within the region. This is in line with findings by AfDB (2019) who noted that reduction of trade barriers can lead to an increase in the GDP of the nations which can be key to unlocking economic benefits which are not only limited to better trading costs. Williams (2021) showed that a nation's income is a key indicator of government spending and trade volumes and associated costs. Ouma (2014) also established that improved nation productivity can be critical to enhancing the value of exports and improving the competitiveness of a country's exports.

### **5.3 Conclusions**

The East African Region has seen various reforms being implemented to significantly improve the region's competitiveness. The findings of the study showed that through application of the trade facilitation there is a significant and positive relationship with the average trade costs. Thus, it is concluded that overall, cross-border facilitation measures account for 84.87% of the overall trade costs. The study also concluded that time to export and time to import did not have a significant influence on the average trade costs.

The research further concluded that cost to export and cost to import did not have a significant effect on the average trade costs. The study also concluded that the regulatory quality index had an insignificant influence on trade costs. The study further concludes that the infrastructure development index has a positive significant influence on average trade costs within the East African Region. The findings also established that gross domestic product per capita had a significant influence on the average trade costs within the East African Region.

### **5.4 Recommendations**

The study findings showed that infrastructure development index had a positive and significant influence on the average trade costs within the region and therefore recommends that the member states should invest more in improving their infrastructure which is critical in conducting trade in the region especially for movement of goods and services across the region. This can be achieved through enhancing physical infrastructure by investing more in roads, rail, and port facilities to facilitate trade. Further investment in ICT infrastructure, such as broadband access and internet security should also be emphasized for communication benefits and to ease financial transactions between trading partners, which can ultimately reduce trade costs. The study also notes that by collaborating in the development of regional infrastructures, the member nations can improve efficiency and share costs, which can reduce trade costs.

The study findings showed that the GDP Per Capita had a significant and negative influence on the average trade costs. This implies that as the size of the economy grows, the income within the economy grows as well. Therefore, the study recommends that the member states should formulate and implement policies that can boost economic growth and development. This will in turn reduce trade costs and enable the region compete in the global value chain.

The study findings showed that trade facilitation measures and GDP per capita account for 84.87% of the variations in average trade costs within the region. However, the findings further showed an insignificant effect of time to export, time to import, cost to export and cost import on the average trade costs. This was an indication that the trade facilitation measures implemented within the region have not had a predictive power on the trade costs within the considered study period. The study therefore recommends that the member states should ramp up their efforts to implement the trade facilitation measures by taking advantage of the technical capacity building being offered by WTO as part of the Trade facilitation Agreement (TFA) to build its capacity to implement the trade facilitation reforms. This will ensure that the region is able to improve its cross-border trade.

### **5.5 Limitations of the Study**

The study adopted only three study variables (custom and border management, infrastructure development, regulatory environment) and size of the economy as the control variable. However, other factors such as corruption and political interference can frustrate efforts to implement trade facilitation measures and impact trade costs. Further, the study was limited by the availability of research data beyond the selected period due to lack of harmonization of the metrics across the region. This limited the number of observations that were included in the research data. The study was further limited by lack of a common currency in the computation of trade costs hence the US dollar was adopted to harmonize the computation of the costs across the various nations included in the study. The study was also limited to the East African Region hence more research work can be conducted reviewing larger customs union such as COMESA which will expand the applicability of the study findings in more nations.

### **5.6 Areas for Further Research**

The study proposes that further research work should be conducted to assess other factors which impact trade costs in the region such as corruption and political interference. Additionally, the study can be further expanded to review the period before implementation of WTO's TFA and the period after to assess the impact on trade costs on the measures implemented so far.

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## APPENDICES

### Appendix I: Data Extraction Form

Construct	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
Time to import (TM)															
Time to export (TX)															
Cost to import (CM)															
Cost to export (CX)															
Africa Infrastructure Development Index (AIDI)															
Regulatory Quality Index (RQI)															
GDP Per Capita															
Trade Costs															

## Appendix II: NACOSTI Permit

 <p><b>REPUBLIC OF KENYA</b></p>	 <p><b>NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY &amp; INNOVATION</b></p>
Ref No: <b>362987</b>	Date of Issue: <b>15/November/2020</b>
<b>RESEARCH LICENSE</b>	
	
<p><b>This is to Certify that Miss. Donna Atieno of Strathmore University, has been licensed to conduct research in Nairobi on the topic: ASSESSING THE EFFECT OF CROSS BORDER FACILITATION MEASURES ON TRADE COSTS IN THE EAST AFRICA REGION for the period ending : 15/November/2021.</b></p>	
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## Appendix III: Institutional Ethics Board Approval



15<sup>th</sup> January 2021

Ms Atieno, Donna  
donna.atieno@gmail.com

Dear Ms Atieno,

**RE: Assessing the Effect of Cross Border Facilitation Measures on Trade Costs in The East Africa Region**


This is to inform you that SU-IERC has reviewed and **approved** your above research proposal. Your application reference number is **SU-IERC0935/20**. The approval period is **15<sup>th</sup> January 2021 to 14<sup>th</sup> January 2022**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://oris.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely,

  
for: Dr Virginia Gichuru,  
Secretary; SU-IERC

Cc: Prof Fred Were,  
Chairperson; SU-IERC



Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000  
Email [admissions@strathmore.edu](mailto:admissions@strathmore.edu) [www.strathmore.edu](http://www.strathmore.edu)