INTEGRATED CUSTOMS MANAGEMENT SYSTEM, COMPLIANCE COST AND TRADE FACILITATION AT BUSIA BORDER IN KENYA

BY

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DECLARATION

Student Declaration

This research project is my original work and has not been presented for a degree at any university.

Sign..... Date……

STANLEY KAMAU

KESRA 105/0029/2022

Declaration by Supervisor.

This project has been submitted for examination with my approval as university supervisor.

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DEDICATION

This research project is dedicated to other scholars who would like to research on the same area, and to my friends and families whose valuable encouragement and support is instrumental in the completion of the research project.

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ABSTRACT

Customs plays an important role in the economy of any country. Customs administrations around the world have an important role in revenue collection, protection of society and supply chain security. Exchange of goods and services has been a common goal worldwide, as the world becomes a global village separated by common borders. The study aimed to determine the moderating effect of compliance cost on relationship between Integrated Customs Management System on trade facilitation at Busia border in Kenya. The specific objectives were to determine the effect of cargo clearance system, duty computation system and customs monitoring system on trade facilitation Busia border, Kenya. Theory of the study was Queueing Theory; Technological Change Theory and Transaction Cost Theory The study adopted explanatory research design. The target population was 137 clearing and forwarding agents with 83% response rate This study used primary data which was collected using structured questionnaires. The data collected was tested for validity, reliability, descriptive, and multiple regression analysis. The study found that cargo clearance system had a significant and positive effect on trade facilitation $\beta=0.179$ $p<0.05$. The study also found that duty computation system had a significant and positive effect on trade facilitation $\beta=0.137$ $p<0.05$. The study further found that those customs monitoring system had a significant and positive effect on trade facilitation $\beta=0.176$ $p<0.05$. The study further found that compliance cost moderates the effects of cargo clearance system on trade facilitation. $\beta=-0.006$ $p<0.05$. The study also found that compliance cost moderates the effects of duty computation system on trade facilitation $\beta=-0.081$ $p<0.05$. Lastly the study found that compliance cost moderates the effects of duty computation system on trade facilitation $\beta=-0.005$ $p<0.05$. The negative coefficient implied that the compliance costs reduced the positive effects of cargo clearance system, duty computation system, and customs monitoring system on trade facilitation. The KRA is recommended to implement advanced cargo tracking and management systems to enhance the efficiency of cargo clearance. Integrating technologies such as RFID and blockchain can streamline procedures and reduce delays. The KRA is also recommended to provide ongoing trainings for customs officials to ensure they are adept at using new systems and can effectively manage the cargo clearance process. The government of Kenya should reduce bureaucratic hurdles and streamline compliance procedures to lower the costs associated with trade. The government of Kenya should enhance the physical infrastructure at the Busia border to support more efficient cargo processing and trade facilitation. A future study should be conducted on the effects of perceived benefit on trade facilitation. A future study should be conducted on the effects of perceived benefit on trade facilitation.By examining the impact of regulatory complexity on trade outcomes, researchers can provide insights into how various levels of administrative requirements influence clearance times, costs, and trade flows.

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ABBREVIATIONS AND ACRONYMS

GPS	–	Global Positioning System.
ICMS	–	Integrated Customs Management System.
IoT	–	Internet of Things
KRA	–	Kenya Revenue Authority.
NCTS	–	New Computerized Transit System.
RFID	–	Radio Frequency Identification.
TRA	–	Tanzania Revenue Authority.
VAT	–	Value Added Tax.
WCO	–	World Customs Organization.

OPERATIONAL DEFINITION OF TERMS

Compliance cost refer to the expenses incurred by taxpayers (individuals, businesses, and organizations) to comply with tax laws and regulations, Smith, (2019)

Customs clearance system: these are systems designed to execute guidelines on export and import, collection of customs duties and facilitation of movement of goods, cargo and people in and outside of a specific country, OECD, (2022)

Customs monitoring system is the system deployed to gather data through observation and recording of activities taking place in customs department, Chang, (2020)

Integrated Customs Management System: This is a scheme that connects Kenya Revenue Authority's internal schemes with the external stakeholders' systems to attain faster cargo clearance; with one repository linking various modules. (TechTarget, 2020).

Trade facilitation: Trade facilitation is defined as the simplification and harmonization of trade procedures, where trade procedures are, ''the activities, practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade". Engman (2019).

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter discussed on the background of the study from a global, regional and local perspective. This is followed by statement of the problem, research objectives, research hypotheses, significance of the study and scope of the study.

1.1 Background of the Study

Customs plays an important role in the economy of any country. Customs administrations around the world have an important role in revenue collection, protection of society and supply chain security. In addition, customs endeavor to improve trade facilitation to encourage investment and reduce poverty World Customs Organization (WCO, 2019). However, the challenges of the 21st century place great demands on customs. Customs must now, more than ever respond to these emerging challenges. An understanding of issues such as globalization, international trade dynamics, technical characteristics of supply chains, emerging political directions, and complexities of the global landscape is required (Gordhan,2020).

Owing to globalization, there has been an upsurge in the exchange of goods, capital and services across international borders or territories. This international trade has made the world one big integrated market place through the establishment of common markets and economic unions characterized by common external trade policies, free movement of goods and services, mobility of factors of production among member countries and integration of economic policies.

A critical factor in promoting this cross-border trade has been the elimination or reduction of barriers to trade (Business Dictionary, 2021). In theory, free trade involves

the removal of all such barriers, except perhaps those considered necessary for health or national security. International trade liberalization has led to reduction in the tariff barriers and now the focus is shifting increasingly to the removal of non-tariff barriers and the facilitation of legitimate trade.

Customs automation makes extensive use of computer systems consisting of comprehensive and integrated software packages which Greenwood et al. (2018) describes as cargo control, to monitor all movements of importation, transit and exportation, and ensure that all goods are duly cleared before release; and declaration processing, to capture and process data for duty and revenue collection.

Swindley (2020) adds payment and accounting, to register and account for payments by importers and exporters; and risk management, to select those consignments bearing higher risks, concealing duty and tax noncompliance, illegal importation of drugs or materials aimed for terrorist activities; statistics and reporting, to extract data for dissemination of foreign trade statistics and to generate management reports for customs for efficient communication between customs, traders, and other government agencies.

The overarching benefit is the direct and indirect reduction in administration cost and increased effectiveness in collection of customs revenue, this since customs administration leads to increased collection of duties and taxes due to the uniform application of laws and regulations through the automated calculation of tax due; and built-in security.

According to Ward and Dietmar (2020) automation brings about benefits such as faster release of cargo passing through customs clearance; simpler procedures and documents, based on international standards; reduced physical examination of goods; separation of

payment of duties and taxes from physical clearance of goods and faster electronic lodgement of customs declarations, using Direct Trader Input or other on-line connections. Holniker (2021) highlighted other advantages as: reduced customs auditing of documents.

Available reports shows that the trade facilitation in Kenya is yet to achieve the expected results and targets, thus putting a doubt on the effectiveness of the automation measures towards enhancing trade facilitation. As of July 2020, World Bank (2021) ranked Kenya 56 out of 190 countries in ease of doing business, behind other countries like Rwanda (38) and Morocco (53). This is an indication that automation has not effectively contributed to the trade facilitation in Kenya, despite WTO, OECD and empirical evidence portraying automation as a major driver to performance of trade facilitation.

The Integrated Customs Management Systems (ICMS) is a modern, robust and efficient system that runs on the latest technological platforms which seamlessly connects with KRAs internal systems and external stakeholders' systems to achieve faster cargo clearance. Run by the Kenya Revenue Authority, ICMS enables trade efficiency by increasing speed in the cargo clearance process, reduction of complexities associated with several systems of the automation of manual processes and reengineering of processes KRA, (2020).

Implemented in phases, the system aims at improving Kenya's Ease of Doing Business by simplifying processes that enable pre-arrival processing and entrenching a process that will allow Authorized Economic Operators (AEOs) to enjoy greater preferential treatment that previously could not be accorded to them due to limitations of the previous SIMBA system. Once fully implemented, ICMS shall counter security threats

through a robust risk management system that will ensure a secure trade chain, facilitate regional integration by integrating with regional Revenue administrations, and providing for transparency of the cargo as the system eliminates human intervention KRA (2020).

WTO agreement on trade facilitation requires that we implement measures to ensure faster movement of transit goods. One of the measures put in place globally is transit monitoring through use of technology-based solutions such as GPS and RFID (WCO, 2019). Most governments are focused on ensuring national security, collecting duties and implementing policies to maintain the integrity of the supply chain. Significant tax loss, cargo theft and compliance to regulatory procedures is a problem customs authority in many parts of the world are grappling with. Cargo owners on the other hand are more concerned with just-in time and reliable deliveries, cost effective logistics and maintaining the integrity of their cargo.

Globally, In Asia's and the Pacific's developing countries, these costs may be higher. Countries across the globe have been strategizing on simplifying international trade processes and procedures in order to maximize gains from trade. The reducing of trade costs and increasing in trade and welfare benefits related to trade and welfare result from increased efficiency of customs procedures of countries that are still developing. Too much requirements on documentation, Chris (2019). Inefficient technology, lack of clarity and lack of transparency and specificity in the requirements for importing and exporting impede trade facilitation.

On average, developed countries tended to do better in trade facilitation than developing countries. World Bank data indicates that border compliance costs for imports in high-income OECD member countries are more than 80 percent lower than in either Latin

American or Sub-Saharan Africa countries. To export woven garments to India from Bangladesh, one has to go through 12 steps, 26 documents and 13 agencies. On average, this business process can take up to 40 days. Factors like issue of inaccurate clean report of findings certificates by inspection agencies in pre-shipment, inadequate facilities for testing, filing of cases by traders and trading community's false declarations cause a lot of delays and inefficiency in clearing imports and exports in Bangladesh Uzzaman & Yusuf, (2021)

Regionally, trade facilitation among trading partners has become increasingly important due to growth in trade being witnessed across continents. In order to ease trade amongst countries, many countries have undertaken to promote measures that facilitate trade; whose main aim is to eliminate non-tariff barriers and other bureaucracies in the clearance of goods and people across nations. In the East African region, such trade facilitation issues are prevalent and several measures under the auspices of global organizations, regional governments as well as the East African Community among other institutions to facilitate trade. Such measures include the elimination of bureaucracies by automating manual processes, adoption of the One Stop Border Stop across borders to enable faster processing and clearance of goods among others, World Trade Organization (2020).

In the Ghana gateway project, realizing the objectives of trade facilitation is highly impeded by corruption in customs excise and preventive service. Despite initiatives being put in place to facilitate trade, a lot of formalities are done when ships arrive in most countries that are still developing, and the port of Mombasa port is no exception. A lot of delays are usually caused by customs and other agencies responsible for facilitating the import and export process. Missing documents during clearance process

and errors made when making import and export declarations are also major contributors of delay in import and export process (UNCTAD, 2019).

In July 2015, Kenyan government came up with new customs reform modernization program known as Simba 2015 to all border posts. On the other hand, Uganda and Rwanda government initiated the use ASYCUDA in their border posts. Rwanda have been performing very well in the information and communication sector through the Rwandan Revenue Authority which has been showing an increment in revenue collection. The time that was been taken during clearance and release of goods have decreased recently as a result of usage of ICT systems in operations of many activities on the border posts.

Trade facilitation refers to the simplification, harmonization, standardization and modernization of trade procedures in terms of import and export processes (WTO, 2015a). It encompasses a wide range of activities involving the interface between business and government and which influence transaction costs. The definition is further extended to mean the improvement of transport infrastructure (transport facilitation), eradication of government corruption, reduction of customs tariffs and resolution of non-tariff trade barriers, and export marketing and promotion.

For trade facilitation to be achieved governments have a big role to play by providing the necessary legal framework, infrastructure, commitment, goodwill and also ratify the various instruments that support trade facilitation. Scholars have established that there is a positive relationship between welfare of nations and trade facilitation therefore countries must endeavor to facilitate trade for their own economic growth and development. The problem of trade facilitation is not confined to specific countries or continent, it is a global phenomenon that has become an important concern with the

international community including organizations such as the Word Bank, International Monetary Fund, World Trade Organization, World Customs Organization, UNECE, UNCTAD, EU, among others. OECD, (2021)

It has been a subject of discussion for decades and finally culminated in the World Trade According to the WTO (2019), trade facilitation involves trade procedures encompassing practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade. In that regard, it is frequently referred to in supply chain security initiatives as Aid for Trade (AfT) and capacity-building initiatives (Grainger, 2020).

Justification of Tax Compliance Costs involves understanding why these costs exist and what purpose they serve in the broader context of taxation and public policy.

1.1.1 The Busia Border Post

Busia is at the international border between Kenya and Uganda. It is situated West of Kenya and East of Uganda, approximately 431 kilometers by road from Kenya's capital city Nairobi and 202 kilometers from Kampala, the capital city of Uganda. It has become a major trading center for both countries and imports to Kenya from Uganda include cotton, timber, fish, bananas, pineapples, maize, beans, groundnuts and sorghum, while Kenyan exports and goods on transit to Uganda include petroleum products, manufactured goods and household items like cooking oil, soap, clothing, electronics and automobiles (USAID, 2010).

The Busia border accounts for the bulk of both trade and human traffic between the two East African countries and is characterized by heavy human traffic, petroleum tankers, small scale cross border trade and containerized cargo trucks carrying imports, exports and goods on transit to other countries such as Rwanda, Burundi, Southern

Sudan and DRC. Government agents on both sides of the border include customs, immigration, bureau of standards, health and security agencies, livestock and fisheries, agriculture, pharmacy and poisons board, plant health inspectorate service and weighbridges. Other main users of the border include the EAC ministry, the county government, clearing and forwarding agents, small traders' associations, and transporters among others (crown agents, 2020).

According to Crown Agents (2020), the Busia border post has been identified as a significant source of delays, which have exacerbated congestion at the Mombasa port. These delays have historically caused dissatisfaction among transporters and customs agents, resulting in strikes and go-slow actions. Frustrated truck drivers and traders often resort to bribery to bypass queues or speed up the processing of their cargo. This inefficiency at the borders, coupled with a lack of enforceable mechanisms for dispute resolution, has been a substantial barrier to unlocking trade potential within East Africa. This issue persists despite the establishment of the East African Community (EAC) Common Market, intended to streamline cross-border trade. In response to these challenges, Compete USAID (2010) proposed the implementation of One-Stop Border Posts (OSBP) to synchronize transit procedures. Under this model, customs officers from neighboring countries would process transit documents simultaneously, reducing clearance times and lowering the costs associated with trade in the region.

1.2 Statement of the Problem

In today's dynamic environment, organizations and states must embrace not only infrastructure, processes and people but also technology to achieve optimal economic productivity, Maur (2008). The increasing volumes of international trade and the involvement of structural diverse groups in the international supply chain has made it

necessary for technology to not only automate but also accelerate customs procedures. The public, particularly traders and investors involved in both domestic and international trade, have frequently criticized customs procedures for being overly bureaucratic, hindering efficient trade facilitation (OECD, 2020).

The customs systems, characterized by layers of procedural complexity, have failed to meet the demands for faster goods movement. There are also many complaints about the compatibility of the computer system used in Busia Border Post. Kenya's export trade has been contracting steadily over the past 20 years. While exports of goods and services previously averaged around 20% of the nation's GDP, this figure dropped to an average of 17.2% over the last decade, and further declined to just 13.9% in the past five years (OECD, 2020). This trend highlights the challenges facing Kenya's trade sector. One notable issue was a major disruption at the Busia Border Post between Kenya and Uganda due to complications with the Integrated Customs Management System (ICMS). This caused significant delays in cargo transportation, negatively impacting trade relations between the two countries (Osere, 2022).

Additionally, despite efforts to modernize trade processes through automation, Kenya has not yet reached its desired goals in trade facilitation. The anticipated improvements have fallen short, raising questions about the effectiveness of these technological advancements. By July 2020, Kenya ranked 56th out of 190 nations in the World Bank's ease of doing business index, lagging behind regional peers such as Rwanda, which ranked 38th, and Morocco, which was 53rd (World Bank, 2021). This suggests that automation alone has not significantly boosted Kenya's trade facilitation, despite international organizations like the WTO and OECD identifying automation as a key driver for improving trade performance.

While there has been an increase in studies exploring the link between regional integration and trade facilitation, many of these investigations remain insufficient in addressing all the complexities involved (Njinkeu et al., 2008). Maur (2008) provides a comprehensive review, highlighting the influence of regional integration on trade facilitation, and reflects on the broader impacts such integration has on improving cross-border trade. However, there is still much room for further exploration in understanding how these dynamics fully interact. A review of empirical literature revealed scarcity of studies on the integrated customs management system on trade facilitation in Africa and Kenya in particular. Therefore, this study sought to establish the moderating effect of compliance cost on relationship between integrated customs management system on trade facilitation at Busia border in Kenya**.**

1.3 Objectives of the Study

This section outlined the general objective and specific objectives

1.3.1 General Objective

The general objective was to establish the moderating effect of compliance cost on relationship between integrated customs management system on trade facilitation at Busia border in Kenya**.**

1.3.2 Specific Objectives

The specific objectives of this study were:

i. To determine the effect of cargo clearance system on trade facilitation at Busia border, Kenya
ii. To determine the effect of duty computation system on trade facilitation at Busia border, Kenya
iii. To determine the effect of customs monitoring system on trade facilitation at Busia border, Kenya.

iv. a). To establish the moderating effect of compliance cost on relationship between cargo clearance system on trade facilitation at Busia border, Kenya

b) To establish the moderating effect of compliance cost on relationship between duty computation system on trade facilitation at Busia border, Kenya

c) To establish the moderating effect of compliance cost on relationship between customs monitoring system on trade facilitation at Busia border, Kenya

1.4 Research Hypotheses

The study was guided by following null hypothesis:

H_{01}: Cargo clearance system has no significant effect on trade facilitation at Busia border, Kenya

H_{02}: Duty computation system has no significant effect on trade facilitation at Busia border, Kenya

H_{03}: Customs monitoring system has no significant effect on trade facilitation at Busia border, Kenya

H_{04a} Compliance cost has no significant moderating effect on the relationship between cargo clearance system on trade facilitation at Busia border, Kenya

H_{04b} Compliance cost has no significant moderating effect on the relationship between duty computation system on trade facilitation at Busia border, Kenya

H_{04c} Compliance cost has no significant moderating effect on the relationship between customs monitoring system on trade facilitation at Busia border, Kenya

1.5 Significance of the Study

The results of this study offer valuable insights for policymakers in the Kenyan government, other East African Community (EAC) member states, and the broader East African Community itself. The findings are not only relevant to all agencies and

stakeholders involved in border control and management but also to public sector managers tasked with facilitating trade. By shedding light on the challenges that managers face in customs operations, the study helps identify critical areas that require attention for improved customs management.

This research is especially significant for industry players like importers and customs clearing agents, as it provides a platform for understanding the impact modernization initiatives have had on their businesses, particularly concerning cargo clearance—one of the key performance indicators for customs operations. The study's outcomes have facilitated ongoing dialogue with the Customs Department of the Kenya Revenue Authority, helping address concerns raised by stakeholders. In turn, this has enabled clearing agents and businesses to adopt systems that enhance trade facilitation, leading to increased efficiency, greater productivity, and faster investment growth, all while reducing operational redundancies.

Moreover, the findings of this study are also a valuable resource for scholars, offering a wealth of material for future research and academic reference. The study contributes to theoretical frameworks related to customs systems and cross-border trade, serving as secondary material for researchers exploring the complexities of trade facilitation, particularly those involving coordination between multiple institutions. Through this, the research supports further exploration of how modernization can shape more effective and efficient customs practices in the region.

1.6 Scope of the Study

The study aimed to examine how compliance costs influence the relationship between Integrated Customs Management Systems and trade facilitation at Busia border in Kenya. Specifically, it sought to assess the impact of three key systems (cargo

clearance, duty computation, and customs monitoring) on trade facilitation at the border post. Compliance cost was considered as the moderating variable in this investigation.

Busia border post was chosen for this study due to its high activity level; it is one of the busiest border points in the East African Community (EAC) and handles a significant portion of cross-border trade in western Kenya. The border post is staffed by all relevant government agencies responsible for the clearance of goods and the movement of people across the border. The study utilized an explanatory research design to analyze these dynamics. The target population was 137 Clearing and forwarding agents at Busia Border post. The primary data was obtained through questionnaires with close-ended questions. This study focused on fiscal year 2022/2024.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discussed reviews on concepts and literature from various sources. The chapter also discussed the theories related to and that supported the study objectives. The chapter identified the gaps based on the literature reviewed. The chapter concludes with drawing up the study variables relationship in the conceptual framework.

2.2 Conceptual Review

This section presents a discussion of concepts of study variables.

2.2.1 Trade Facilitation

Sohn (2021) defines trade facilitation as the array of activities or policies aimed at reducing transaction costs by eliminating or simplifying cumbersome procedures, practices, and processes, thereby increasing efficiency and boosting trade. The global interest in trade facilitation has risen with the expansion of trade volumes, driven by worldwide trade liberalization. The prominence of trade facilitation as a key issue emerged during the Singapore Ministerial Conference in 1996 and was further emphasized in the Doha Development Agenda, which established the framework for the Agreement (Hoek et al., 2019).

Trade facilitation involves removing or avoiding trade restrictions and simplifying border clearance procedures. It is characterized by providing necessary information to relevant border agencies to make the clearance of goods and border crossings more predictable and cost-effective. Ineffective trade facilitation can significantly hinder international trade, leading to increased costs for goods and services. Inefficiencies and bureaucratic hurdles at border crossings often exacerbate these issues.

It's important to note that simply promoting trade, removing restrictions, or providing transportation infrastructure does not necessarily equate to effective trade facilitation. Trade facilitation primarily focuses on minimizing the costs associated with enforcing regulations and policies (Staples, 2021).

In East Africa, trade could have experienced greater growth if various factors impacting trade facilitation had been addressed. Key challenges include inadequate road infrastructure, outdated technology, and poor governance. Lima and Venables (2020) report that infrastructural challenges account for approximately 40% of transport costs, with landlocked countries facing up to 60% of these costs. Additionally, inefficiencies at borders are exacerbated by incompatible document processing systems between countries. For example, Kenya uses the Simba System 2004, while Uganda operates the ASYCUDA World. Such discrepancies hinder market exploration and integration within the East African Community (Yang & Gupta, 2021; Njinkeu & Powo Fosso, 2006; Forouton & Princhet, 2020). Efforts have been made to address this through the Revenue Authorities' Digital Data Exchange (RADDEX) platform, which aims to facilitate data exchange between these systems, but its potential remains underutilized.

2.2.2 Cargo Clearance System

Cargo clearance systems are crucial components of international trade, facilitating the efficient movement of goods across borders while ensuring compliance with customs regulations and security protocols. Electronic Data Interchange (EDI) enables the electronic exchange of data between various stakeholders involved in the cargo clearance process, such as importers, exporters, customs authorities, and shipping companies. It streamlines documentation and reduces the need for manual paperwork, thereby enhancing efficiency and accuracy. According to Ghiani et al. (2021),

Electronic Data Interchange (EDI) plays a crucial role in modern logistics systems by enabling seamless information exchange between different entities in the supply chain, including customs authorities, shipping companies, and traders.

Cargo clearance systems employ risk management techniques and profiling algorithms to identify high-risk shipments for closer inspection. This approach allows customs authorities to allocate resources effectively and focus scrutiny on consignments with a higher likelihood of non-compliance or security threats. In their study, Hwang and Lee (2019) emphasize the importance of risk management strategies in cargo clearance processes, stating that "the implementation of risk management techniques, such as risk profiling and targeting, enables customs authorities to prioritize inspections and allocate resources efficiently.

As noted by UN/CEFACT (United Nations Centre for Trade Facilitation and Electronic Business), "Automated document verification systems play a crucial role in expediting cargo clearance processes by accurately validating the authenticity and completeness of trade documents, thus reducing the risk of errors and discrepancies." According to Kim and Laskowski (2018), collaborative platforms enable seamless communication and data exchange among supply chain partners, fostering greater transparency and coordination in cargo clearance operations. This collaborative approach enhances efficiency and responsiveness to changing trade dynamics.

2.2.3 Duty Computation System

Duty computation system is a critical component of customs operations, responsible for accurately calculating and assessing import duties, taxes, and fees applicable to imported goods. Duty computation system utilizes internationally standardized Harmonized System (HS) Codes to classify imported goods based on their nature,

composition, and intended use. Tariff classification is essential for determining the applicable duty rates and regulatory requirements associated with each product category. The World Customs Organization (WCO, 2020) emphasizes the significance of HS codes in duty computation, stating that HS codes provide a standardized framework for classifying goods in international trade, enabling customs authorities to apply the correct duty rates and enforce trade regulations consistently.

According to the International Chamber of Commerce (ICC, 2022), Customs valuation methods play a crucial role in duty computation by providing a transparent and standardized approach to determining the customs value of imported goods, thereby ensuring fairness and consistency in duty assessment. Duty computation system manages tariff rate quotas (TRQs) and special duty programs that impose specific duty rates or volume restrictions on certain imported goods. TRQs allocate a predetermined quantity of goods that can be imported at a lower duty rate, while special duty programs may offer duty exemptions or reductions for specified purposes, such as industrial development or environmental protection. Automated duty calculation tools enhance the efficiency and transparency of customs procedures, reducing administrative burdens for traders and customs authorities alike. These systems contribute to trade facilitation and compliance with customs regulations WTO, (2020)

2.2.4 Customs Monitoring System

A customs monitoring system is a comprehensive framework designed to monitor and regulate the flow of goods across borders, ensuring compliance with customs regulations, trade policies, and security measures. Real-time tracking and monitoring technologies, such as GPS, RFID, and IoT sensors, are utilized to monitor the movement of goods from the point of origin to their final destination. This enables

customs authorities to track shipments throughout the supply chain, detect any deviations or delays, and ensure compliance with established transit routes and delivery schedules OECD, (2021).

According to Gruenwald and Pohlmann (2019), "Real-time tracking and monitoring technologies provide customs authorities with visibility into the entire supply chain, allowing them to monitor the movement of goods in real-time and intervene promptly in case of any irregularities or security threats. Automated cargo screening systems utilize advanced imaging technologies, such as X-ray scanners and gamma-ray imaging, to inspect cargo containers and identify any contraband, prohibited goods, or security threats concealed within shipments. These systems enhance the efficiency and effectiveness of customs inspections while minimizing disruptions to legitimate trade.

According to the World Customs Organization WCO, (2021), "Automated cargo screening systems play a critical role in modern customs operations by enabling non-intrusive inspection of cargo containers, facilitating the detection of illicit goods, and enhancing border security without unduly impeding the flow of legitimate trade. Customs monitoring systems are integrated with trade facilitation initiatives, such as single window systems and trusted trader programs, to streamline customs procedures, reduce administrative burdens, and expedite the clearance of legitimate trade. By harmonizing customs processes and promoting regulatory coherence, these initiatives contribute to smoother cross-border trade flows. According to the International Chamber of Commerce ICC, (2019), "Integration of customs monitoring systems with trade facilitation initiatives, such as single window systems and mutual recognition arrangements, enhances the efficiency and predictability of international trade transactions, thereby fostering economic growth and development.

2.2.5 Compliance Cost

Compliance costs refer to the expenses incurred by businesses to adhere to regulatory requirements, standards, and procedures imposed by governments or international organizations (OECD, 2018). Compliance costs encompass both direct expenses such as tariffs, taxes, and fees, as well as indirect costs related to administrative tasks, regulatory compliance procedures, and delays in customs clearance (World Bank, 2020). High compliance costs can pose significant challenges for businesses, particularly small and medium-sized enterprises (SMEs), by reducing profitability, increasing administrative burdens, and impeding competitiveness in global markets (UNCTAD, 2018).

Trade facilitation measures, such as simplified customs procedures and automation of processes, can help reduce compliance costs for businesses by streamlining administrative procedures, minimizing delays, and enhancing transparency in trade transactions (Hoekman & Shepherd, 2018). Trade facilitation initiatives promote faster clearance of goods at borders and reduce bureaucratic hurdles, leading to overall efficiency gains and enabling businesses to allocate resources more efficiently (Djankov et al., 2017). Lower compliance costs and improved trade facilitation can enhance the competitiveness of businesses in global markets by reducing barriers to trade, facilitating access to new markets, and fostering participation in global value chains (Chang & Winters, 2020).

2.3 Theoretical Framework

The study is being guided by the following theories: system theory, Technological Change Theory and Transaction Cost Theory

2.3.1 System Theory

Systems theory, initially developed by Ludwig von Bertalanffy (1974), Boulding (1985), Rapoport (1986), and Skyttner (1996), was not originally intended for business applications but has significantly influenced organizational management (McSherry and Warr, 2010). This theory conceptualizes an organization as a complex entity comprised of interconnected sub-units that collectively form a cohesive whole (von Bertalanffy, 1974). According to Skyttner (1996), the primary objective of systems theory is to understand the organization as a complete system, rather than just focusing on its individual components.

The principles of systems theory have been applied across various fields. Practitioners such as physician Alexander Bogdanov, biologist Ludwig von Bertalanffy, linguist Béla H. Bánáthy, and sociologist Talcott Parsons have contributed to its development. In ecology, Howard T. Odum and Eugene Odum utilized systems theory, while Fritjof Capra applied it to organizational theory. Peter Senge used systems theory in management, and Richard A. Swanson incorporated it into human resource development. Educators like Debora Hammond and Alfonso Montuori have also employed its concepts.

By the 1970s, systems theory gained prominence among organizational researchers due to its ability to address the limitations of classical models, which often failed to account for complex organizational behaviors. Seminal works in organizational communication, such as those by Farace, Monge, & Russell (1977), Goldhaber (1974), Monge (1973), and Thayer (1968), highlighted the inadequacies of classical models and underscored the benefits of systems theory. Unlike classical models that emphasize

minimal interaction and autocratic structures, systems theory advocates for maximizing interaction and democratic governance (Scott, 1974).

The adoption of systems theory was further driven by the recognition of the complex and rapidly changing nature of organizational environments (Ashmos & Huber, 1987). Moving away from the machine metaphor, systems theory conceptualizes organizations as living organisms (Morgan, 1986). This theoretical shift laid the groundwork for important developments such as the open systems approach (Katz & Kahn, 1966). Due to its abstract nature, the contingency view emerged as a complementary perspective, focusing on specific relationships within and between organizational subsystems and their interactions with the environment to understand organizational adaptation (Lawrence & Lorsch, 1967).

In practical terms, systems theory emphasizes that for an organization to achieve its objectives, every unit must function effectively. This means that automating customs systems alone may not suffice to enhance revenue collection. While technologies such as cargo tracking systems, scanners, and customs valuation tools may improve efficiency and transparency, they represent only parts of the overall system. Therefore, even with automation, customs departments may still struggle to meet revenue targets if other influencing factors are not addressed. This study will use systems theory to examine the impact of an integrated customs management system on trade facilitation, considering the entire system rather than isolated components.

2.3.2 Technological Change Theory

The theory of technological change, as articulated by Everett M. Rogers, encompasses the entire process of innovation, invention, and diffusion of technology. This theory is particularly relevant to the adoption of Integrated Customs Management Systems

within customs administrations. Previously, the 'Linear Model of Innovation' was used to describe technological change, but this model has largely been replaced by a more comprehensive approach that includes innovation at every stage of research, production, dissemination, and use (Tidd et al., 1997). Generally, technological change modeling reflects a continuous improvement process, often depicted as a curve demonstrating decreasing costs over time (Coronado et al., 2018).

In the realm of customs systems management, technological advancements have significantly transformed how customs operations are conducted to enhance trade facilitation. A notable example of this evolution occurred in Kenya's customs department. In 2005, the Kenya Revenue Authority implemented the Simba 2005 system with technical assistance from the Senegalese government. This system was a key part of the modernization and reform efforts aimed at improving customs operations, which are crucial for handling exporters and importers and generating substantial revenue (Mbui, 2021). Simba 2005 was designed to streamline the clearance and forwarding of goods by enabling electronic submissions for import and export documentation and facilitating the easy lodging of traders' information within the system. The Simba 2005 system was eventually succeeded by the Integrated Customs Management System, which replaced it in 2016.

Further advancements were made in 2014 with the introduction of the Electronic Single Window System. This system marked a significant improvement by simplifying and expediting the documentation process for cargo clearance across Kenya's borders (Djanitey, 2018). The Single Window System represents a major technological shift aimed at supporting international trade by reducing delays and lowering costs associated with border clearance, while still ensuring necessary controls and the

collection of levies, charges, duties, and taxes on imports and exports. These technological innovations have been implemented to promote trade facilitation, reduce business costs, and enhance the efficiency of international trade processes, including import and export procedures and transit processes managed by customs and other relevant organizations.

2.3.3 Transaction Cost Theory

Transaction cost theory, as developed by Williamson (1985), posits that the costs associated with establishing and monitoring partnerships influence the choice of entry modes in business. According to this theory, if market-based solutions are available, firms will often prefer them due to the potential for benefiting from the economies of scale provided by the marketplace. However, McIvor (2005) notes that firms may incur higher costs in locating or negotiating market-based agreements due to challenges in anticipating all contingencies or due to information asymmetry, which can hinder obtaining fair prices.

The use of Radio Frequency Identification (RFID) technology in cargo monitoring has demonstrated significant value in improving transit management across global supply chains. RFID systems can reduce inventory costs by up to 70% while enhancing the quality of service provided (Raghu & Harrop, 2013).

McIvor (2005) further explains that transaction costs are pivotal in determining the organization of economic activities along a continuum of business administration modes. These costs arise from four main areas: search costs, contracting costs, monitoring costs, and enforcement costs. Consequently, Faems (2008) argues that transaction cost theory makes firms susceptible to opportunistic behavior from their exchange partners, especially when assessing partner performance is challenging. To

mitigate these risks, trust is proposed as a crucial alternative governance mechanism. Trust can reduce the need for complex, costly contracts and facilitate extensive information sharing between partners, which helps in mutual adjustment as needed.

Aubert (2004) suggests that transaction costs reflect friction in the market or the cost of utilizing the price mechanism. When the marginal cost of using the market exceeds the cost of managing transactions within a firm, it is more efficient for the firm to handle transactions internally. Integrating operational functions can enable firms to focus on their core value-creating activities, thereby enhancing effectiveness. Additionally, as cross-border business activities increase, transaction costs may decrease, reducing the need for investments in facilities, equipment, and workforce. Sauve and Zampetti (2010) highlight that optimizing transaction costs in regional trade facilitation depends on the involvement of appropriate participants. Addressing coordination and capacity issues is crucial, particularly when independent national governments address regional trade facilitation challenges separately (Arce & Sandler, 2002).

2.4 Empirical Literature Review

This section presents a discussion of empirical literature review

2.4.1 Cargo Clearance System and Trade Facilitation

In Croatia, Erceg (2019) argued that adoption of e - customs significantly altered the role of international forwarders and customs authorities. The NCTS was one of e-customs tools being implemented by Croatians when the country was making preparation to join European Union. Erceg found out that utilization of the NCTS assisted business people to reduce transit time from the Croatian border to products destination. The NCTS also shortened waiting time at the border and this created saving in transit time. It also saved money for preparing customs documentation processes at

the border, it facilitated enhanced, quicker and professional work-related procedure of transportation of cargo.

Luther (2021) conducted a study on the impact of the cargo clearance system on revenue collection at the Durban Container Terminal. Utilizing a survey research design, Luther sampled both operators and customs officers. The study revealed that while the cargo clearance system improved auditability, there was an increase in transfer costs due to the need to move containers to and from the clearance area. Luther also noted a need for installing additional clearance machines and equipment to enhance the system's efficiency.

In another study, Cirincione et al. (2018) explored the effects of cargo scanners on customs departments. Their descriptive research identified a significant challenge in achieving 100% maritime cargo container scanning. While the costs of scanning containers were manageable, the additional expense incurred when a container required both scanning and physical inspection led to increased overall costs. Furthermore, the indirect costs, such as delays that were difficult to quantify, proved to be discouraging for stakeholders involved in container scanning. UNCTAD (2018) notes that trade facilitation reforms can lead to increased trade flows, expanded market opportunities, and diversification of exports, particularly for developing countries. These reforms contribute to integrating countries into global value chains and promoting economic diversification.

Amosa (2020) conducted a study to assess the impact of cargo tracking technology on customs revenue collection performance in Kenya. Utilizing an explanatory research design, the study found that cargo tracking systems significantly and positively influenced customs revenue collection. Specifically, it was noted that effective

management of containerized cargo and motor vehicle transit helped in preventing dumping and increasing revenue from imports. These findings were consistent with an earlier study by Mugambi (2017), which reported that electronic cargo tracking at the Kenya-Uganda borders reduced cargo clearance time, minimized local market dumping, and lowered cargo monitoring costs for the customs department.

Kwalia (2020) examined the impact of adopting electronic customs processes on clearing and forwarding agents in Nairobi using a descriptive survey design. The study involved 350 out of 962 firms and found that embracing electronic customs processes greatly affected these firms. The adoption of IT systems with internet connectivity led to significant reductions in average lodgment time, clearance time, and lodgment costs. However, challenges such as insufficient technical skills, financial constraints, and system incompatibilities were noted as barriers to effective implementation (World Bank, 2021).

Serete (2019) investigated factors affecting containerized cargo clearance at the Kenya Port Authority (KPA) using a descriptive research design. The study targeted 200 respondents, with a stratified random sampling method selecting 25% of this population. The research revealed a strong positive relationship between factors such as documentation processes, handling equipment, transport infrastructure, and space capacity, and the efficiency of containerized cargo clearance at KPA. The implementation of a single window system was identified as a potential solution to address congestion issues at the port.

Omosa (2020) explored the effect of cargo tracking systems on customs revenue performance in Kenya. Correlation analysis indicated a positive and significant association between cargo tracking systems and customs revenue performance.

Regression analysis further supported these findings, showing a significant positive linear relationship with a p-value of 0.004, indicating that cargo tracking systems were effective in explaining variations in customs revenue performance in Kenya.

2.4.2 Duty Computation System and Trade Facilitation

In Malaysia, Azmi and Kamarulzaman (2020) observed that, despite the rapid adoption of computerized duty systems, the technology has faced reliability issues due to a high perception of risk among the public. This indicates that technological adoption in tax administration can be hindered by trust issues and perceived risks.

Nisar (2013) highlighted that in many developing countries, tax authorities struggle with tax compliance issues even after adopting computerized systems. This suggests that technology alone may not resolve compliance challenges without addressing underlying systemic issues.

In the Philippines, Alcedo and Cajala (2015) evaluated the computerization program of the Bureau of Customs (BOC), focusing on import and export transactions. The study, which employed a descriptive-survey method with a validated questionnaire, found that while the program's perceived benefits were largely achieved, its impact on reducing corruption was only moderate. The computerization of BOC was deemed effective overall, but import/export documentation was considered only fairly effective.

Ondogo (2020) studied the implementation of a Single Customs Territory (SCT) by East African Community countries, aiming to streamline cross-border trade by simplifying customs documentation, removing cumbersome procedures, and automating systems. The study utilized descriptive statistics and econometric methods to assess the SCT's impact on Tanzania’s exports from 2004 to 2018. The findings revealed that Tanzania's merchandise exports to other EAC countries remained low

under the SCT, indicating that the system's benefits might not have fully materialized.

In Gambia, the government invested in computerization infrastructure to enhance revenue collection and address issues such as fiscal corruption, fraud, and tax evasion (Jallow, 2016). Similarly, Gidisu (2012) found that automation served as a powerful monitoring tool for the Ghana Revenue Authority, highlighting its effectiveness in oversight and enforcement.

Kariuki (2019) emphasized the crucial role of ICT in revenue administration. The study noted that ICT facilitates accessible data management, reduces computation errors and processing times, and lowers overall costs. Additionally, it improves client service and voluntary tax compliance, which leads to increased revenue collections and less frequent taxpayer interactions with authority staff.

Duncan (2020) identified three key factors for the successful adoption of technology in enhancing tax compliance: A flexible IT structure, a competent IT skill base, and a strong customer orientation. Kamau (2014) investigated the impact of online technology on tax compliance among large taxpayers in Kenya. The study concluded that technology adoption positively influences compliance levels, emphasizing its role in improving tax administration effectiveness.

2.4.3 Customs Monitoring System and Trade Facilitation

In Romania, Vatuiu and Tarca (2021) reported that the introduction of a new e-customs electronic system has enhanced the monitoring of product improvement within the country. This system has bolstered the customs authorities' ability to oversee trade in excise cargo, leading to increased revenue for the excise department, a reduction in fraud incidents, and compliance with European Union standards for e-customs systems.

Bujak (2019) highlights that effective customs systems can include various technologies such as screening, electronic monitoring, border crossing weigh-in-motion, automatic equipment identification, and credential supervision. Mahlknecht and Madani (2007) emphasize that Electronic Cargo Tracking Systems (ECTS) are crucial for ensuring the security and safety of the supply chain from consolidation and packaging to final delivery. Despite their advantages, Miller notes that these systems might lack cost-effectiveness and flexibility in managing inter-modal supply chains.

Cargo tracking systems, which use real-time monitoring through e-seals on outbound trucks, have proven effective in border management, containerized cargo transit, and motor vehicle transit management (Freeman, 2017). According to ESCAP (2013), countries like China, Viet Nam, the Republic of Korea, and Thailand have implemented satellite positioning systems and electronic seals to monitor and secure the movement of goods, including dangerous items and passengers. In Shenzhen, Hong Kong, and Thailand, customs authorities use technologies such as GPS and RFID for monitoring goods in transit from customs zones to border crossings. Jordan first introduced such monitoring technology in 1997, though initial efforts were delayed by technological limitations (Alfitiani, 2021).

Kabiru (2020) identifies several challenges in implementing transit monitoring systems, including inadequate infrastructure, high implementation costs, lack of training, and insufficient understanding of requirements. However, these systems have significantly reduced the dumping of goods in the market by ensuring effective tracking from one border point to another.

The Regional Electronic Cargo Tracking System (RECTS), initiated by the Kenya Revenue Authority in collaboration with Uganda and Rwanda, aims to extend to all

East African Community (EAC) states and neighboring countries. This system facilitates real-time tracking of transit cargo from the port of Mombasa to its final destination via an online digital platform (KRA, 2018). By April 2018, the Transit Business Module was undergoing acceptance testing with various stakeholders, including KENTRADE, shipping agents, the Kenya Ports Authority, and container freight stations (Hollaway, 2008).

2.4.4 Compliance Cost as a Moderator

Djankov et al. (2019) found that reducing trade costs by improving trade facilitation can lead to significant increases in trade flows and economic welfare. The study emphasized the importance of streamlining customs procedures and reducing bureaucratic hurdles to lower trade costs effectively. Teklu and Negus (2021) highlight the widespread adoption of time release studies by various countries, driven by the aim of reducing business costs and boosting national economies in line with World Customs Organization guidelines.

In Ethiopia, the Ethiopian Revenue and Customs Authority (2010) reported exports of approximately 1,626.9 million tons and imports of about 7,051.5 million tons. Despite this substantial trade volume, the World Bank (2009) noted significant challenges in goods clearance, which hampers business operations and negatively impacts the national economy. Landlocked countries, like Ethiopia, often face high logistics and development costs, contributing to their lower performance.

Tran-Nam, Evans, and Walpole (2020) observed that tax compliance involves both social costs and taxpayer compliance costs. Administrative costs are incurred by the government during tax collection and recovery, while social costs include efficiency losses and administrative expenses. The total of these costs is referred to as the

operating costs of compliance. Stanford (2019) attributes rising compliance costs to technological changes and the complexity of tax systems. Tran-Nam et al. (2020) define net compliance costs as the difference between gross compliance costs and compliance benefits, which include tax deductibility, cash flow advantages, and managerial benefits.

The Economic Commission for Africa (2021) reported that many African countries still struggle with inadequate policy and regulatory environments, which impose high business costs (Beyene, 2022). Complex tax systems exacerbate these issues, making it costly and challenging for taxpayers to comply with regulations due to extensive record-keeping and the need for specialized information (Bird & Wallace, 2022). This complexity disproportionately affects small enterprises in developing countries, including Uganda, pushing them to operate outside the official reporting system (Kayaga, 2017). Increased labor costs due to stringent tax rules incentivize businesses to evade these costs by participating in the informal economy (Schneider & De Soto, 2019).

2.5 Summary of Previous Studies and Research Gaps

In Malaysia, Azmi and Kamarulzaman (2020) observed that although there has been swift adoption of computerized duty systems, the reliability of these systems remains problematic. This unreliability stems from a pervasive public perception of risk associated with the technology. Similarly, Nisar (2013) highlighted that tax authorities in developing nations continue to struggle with compliance issues despite the implementation of computerized systems. The study conducted in Malaysia underscores both a contextual and conceptual gap, reflecting broader challenges in adapting these systems to local conditions and expectations.

In the Philippines, Alcedo and Cajala (2015) evaluated the effectiveness of the Bureau of Customs' (BOC) current computerization program, focusing on import and export processes. They employed a descriptive-survey approach, using a validated questionnaire to collect data from customs brokers, shipping agents, freight forwarders, and Value-Added Service Providers (VASP). While this study provided valuable insights, it utilized a descriptive-survey design, which contrasts with the explanatory research design used in the current study. This difference points to a methodological gap, along with a contextual gap, as the study was specific to the Philippine context.

In Gambia, the government recognized the importance of investing in computerized infrastructure to enhance revenue collection systems. The aim was to develop more effective fiscal mechanisms and address issues related to fiscal corruption, fraud, tax evasion, and avoidance, which have led to significant revenue losses (Jallow, 2016). Conversely, Gidisu (2012) demonstrated that automation has proven to be a powerful tool for monitoring in the Ghana Revenue Authority. The focus of these studies on Gambia and Ghana highlights a contextual gap, as the findings are geographically specific.

Kwalia (2020) investigated the impact of adopting electronic customs processes by clearing and forwarding agents in Nairobi. The study employed a descriptive survey design, surveying 350 out of 962 Nairobi-based firms. The findings indicated that the adoption of electronic processes significantly affected these firms by necessitating IT systems with internet connectivity. The study reported substantial reductions in average lodgment time, clearance time, and lodgment costs. This research employed a descriptive design, revealing a methodological gap when compared to other research approaches.

Ondogo (2020) examined the implementation of a Single Customs Territory (SCT) among East African Community (EAC) countries, aimed at simplifying customs procedures and reducing costs and delays through document harmonization and system automation. The study utilized descriptive statistics and econometric methods to assess the impact on Tanzania's exports from 2004 to 2018. The findings revealed that Tanzania's merchandise exports to EAC countries remained low despite the SCT, highlighting a methodological gap due to the use of descriptive statistics and econometric estimation methods.

Luther (2021) conducted a study at Durban Container Terminal focusing on cargo clearance systems and revenue collection. Employing a survey research design, he gathered data from operators and customs officers. The study found that while the cargo clearance system improved auditability, there were increased transfer costs associated with moving containers to and from the clearance area. Luther recommended the installation of additional clearance machines and equipment. This research centered on revenue collection, creating a conceptual gap with the current study's focus on trade facilitation.

2.6 Conceptual Framework

A conceptual framework is a structure in diagrammatic form that is used to show the interaction between the variables (Bogdan & Biklen, 2013). It is used to represent how the variables of the study are to be measured or operationalized (Bell, Bryman & Harley, 2018). As indicated in Figure 2.1, the independent variables include cargo clearance system was measured by Containerized cargo clearance and documentation procedure. Duty computation system was measured by Flexible payments and Duty confirmation. Customs monitoring system was measured by Tracking device and Real

time monitoring. Dependent variable was trade facilitation measured by Tax paid and volume of goods traded. While the moderator was compliance cost which was measured by Demurrage charges and Cost of hiring agents.

Independent Variables

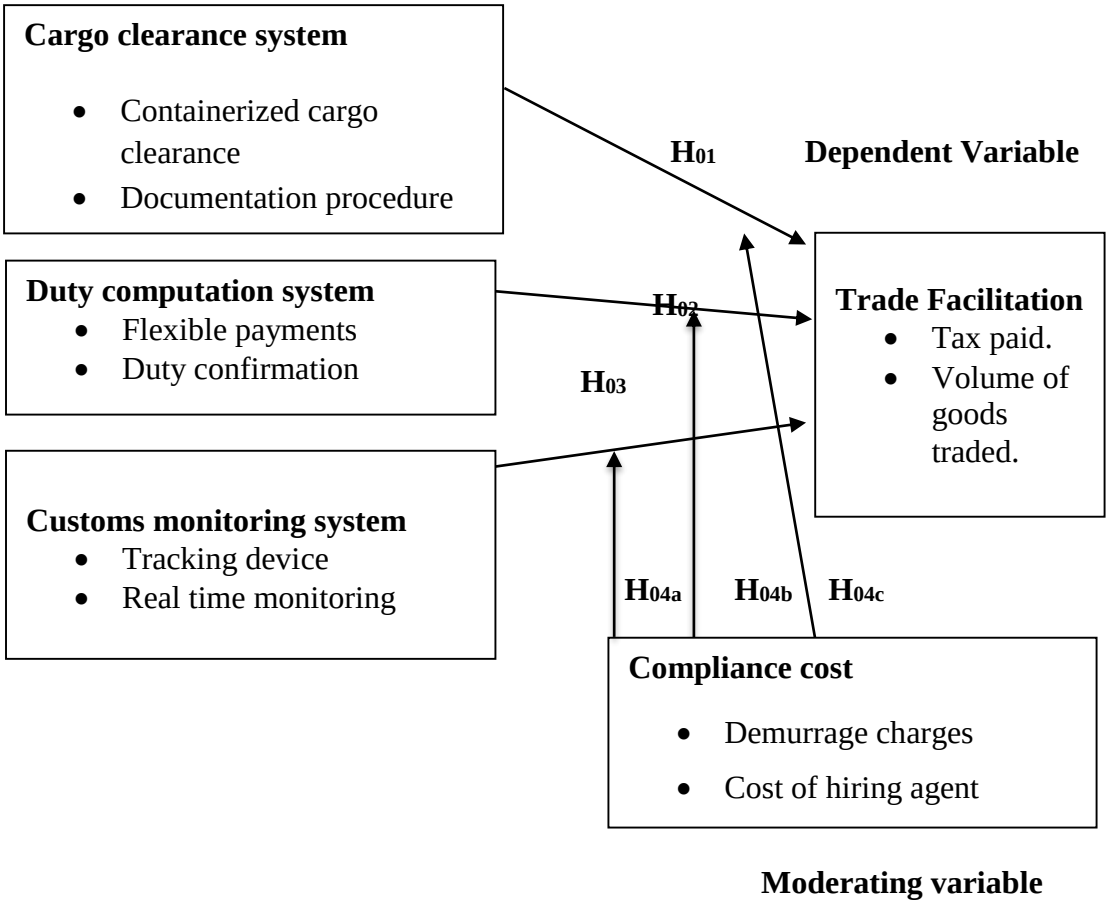

Figure 2.1: Conceptual Framework

Source: (Researcher, 2024)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines the research design and methodology, including several key sections. It starts with the research design and target population, followed by details on sampling size and procedures. The chapter then covers the research instruments, pilot testing, and their validity and reliability. It also describes the data collection and analysis procedures, concluding with ethical considerations. This structured approach ensures a comprehensive understanding of the research process and methods used.

3.2 Research Design

Research design refers to the systematic arrangement of conditions for data collection and analysis, aimed at achieving both relevance to the research objectives and efficiency in the procedure (Kothari, 2014). In this study, an explanatory research design was utilized, involving the collection of data through questionnaires. Explanatory research is characterized by hypotheses that define the nature and direction of relationships between variables. This design is particularly suited for the study as it facilitates the generalization of findings to a broader population (Schindler & Cooper, 2003).

3.3 Target Population

The target population, as defined by Borg and Gall (2009), represents the entire group of individuals or entities (whether real or theoretical) about whom the researcher aims to generalize. For this study, the focus was on key stakeholders directly engaged in trade facilitation and the release of goods in Kenya. The target population was 137 clearing and forwarding agents at Busia border, KRA, (2023). Busia border was chosen because Busia is a major entry and exit point for goods and services between Kenya

and Uganda. Borders often pose unique tax compliance challenges due to the high volume of trade, informal business activities, and smuggling. This used census survey, therefore no sampling required. Census data covers entire populations rather than samples, providing a complete picture of the population.

Table 3.1: Target Population

Category	Population	Percentage of Pop.
clearing and forwarding agents	137	100
	137	**100**

Source: KRA (2023)

3.4 Data Collection Instruments

In this research, a questionnaire was used as the primary instrument for data collection. According to Davies and Hughes (2015), a questionnaire is a research tool that comprises a series of questions designed to collect information from respondents. As outlined by Maxwell (2012), the researcher should clearly explain the methods used for gathering data. For this study, questionnaires were chosen due to their effectiveness in capturing detailed opinions from respondents regarding the research problem. The responses were measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

3.5 Data Collection Procedure

Kumar (2011) emphasizes that when choosing a data collection method, it is crucial to consider the socioeconomic and demographic characteristics of the study population. In this research, self-administered questionnaires were distributed to the sampled respondents. Each questionnaire included an introductory letter that introduced the researcher and outlined the study's objectives. To facilitate data collection, the researcher secured an introductory letter from KESRA and obtained research permits

from the National Commission for Science, Technology, and Innovation (NACOSTI). The questionnaires were administered using the drop-and-pick later method over a span of three weeks.

3.6 Pilot Testing

A pilot test, as described by Kombo and Tromp (2009), is a preliminary survey conducted before the main study to evaluate the effectiveness of the research instruments. This preliminary phase is crucial for assessing the reliability and validity of the questionnaire (Cooper & Schilder, 2011). Mugenda and Mugenda (2003) recommend using a small sample, typically around 10% of the total respondent pool, for the pilot study. The pilot test helps refine the research tools by identifying potential weaknesses and making necessary adjustments to enhance their reliability and clarity. In this study, the questionnaire was piloted with 13 clearing and forwarding agents from the Malaba border, selected for their similar characteristics to the target population. These respondents were not included in the final study sample to ensure that the pilot test did not influence the actual research results.

3.6.1 Reliability of Research Instruments

Reliability is enhanced by incorporating multiple similar items in a measure, testing a varied sample, and maintaining consistent testing procedures. To assess the reliability of the research instruments, internal consistency was evaluated using Cronbach’s Alpha. This statistical measure ranges from 0 to 1, with higher values indicating greater reliability. As noted by Mugenda (2008), a Cronbach's Alpha coefficient between 0.6 and 0.7 is generally considered acceptable, while a coefficient of 0.7 or above is deemed indicative of good reliability.

3.6.2 Validity of Research Instruments

Validity, as defined by Berg and Gall (1989), refers to the extent to which a test accurately measures the content it is intended to assess. To ensure that the data collection tools meet required standards and effectively gather the necessary data, they must be validated before the actual research takes place (Shuttle, 2009). Cooper and Schindler (2006) outline three primary approaches for testing validity: content, construct, and criterion-related validity.

In this study, content validity was utilized, which assesses how well the test items represent the broader domain or trait being measured. To establish content validity, the researcher outlined the overall content to be covered and then selected items that accurately reflected this content. Expertise was sought from tax specialists at Moi University and KESRA to review and validate the instrument's content. Additionally, factor analysis was employed to further assess and confirm the content validity of the measuring instrument.

3.7 Diagnostic Tests

To address research design challenges and ensure diagnostic accuracy, several key tests are conducted (Lijmer et al., 1999). Before analyzing the data, four critical diagnostic tests are performed: normality, linearity, homoscedasticity, and multicollinearity. These tests are essential for validating the accuracy and reliability of the findings.

3.7.1 Normality Test

The normality of the data was assessed using the Shapiro-Wilk test, which evaluates how closely the data follows a normal distribution. This test determines the degree of normality by examining the distribution of the data. A P-value greater than 0.05 indicates that the data is likely to be normally distributed. According to Garson (2012),

a normal distribution of the mean is typically assumed if the P-value meets this criterion.

3.7.2 Linearity Test

Linearity tests were conducted to ensure that the relationship between the independent and dependent variables is linear. This was assessed using a deviation from linearity metric. According to Csorgo (1985), the Ramsey RESET test is used to evaluate this assumption. If the p-value for the deviation from linearity is greater than 0.05, it indicates that the linearity assumption holds. Conversely, if the p-value is 0.05 or less, it suggests that the linearity assumption has been violated.

3.7.3 Multicollinearity Test

To determine the presence of multicollinearity, it is assessed using variance inflation factors (VIF). According to Collis and Hussey (2014), multicollinearity is considered problematic if the VIF is greater than 10 or if tolerance values are less than 0.1. In this study, VIF was calculated using Statistical Package for Social Sciences (SPSS). Predictor variables were retained in the model provided their VIF values fell within the acceptable range suggested, indicating that multicollinearity was not an issue.

3.7.4 Homoscedasticity test

Homoscedasticity refers to the consistency of the variance or spread of errors around the regression line. According to Lani (2011), in regression analysis, an error represents the deviation of a point from the regression line. The assumption of homoscedasticity implies that the spread of residuals or error terms should remain constant across the range of values. If this assumption is violated, it could lead to unreliable statistical results and biased coefficient estimates. In this study, the Breusch/Pagan test was

employed to assess homoscedasticity, with a p-value greater than 0.05 indicating that the assumption was not violated and the variance of errors was consistent.

3.8 Data Analysis and Presentation

Yin (2009) defines data analysis as the process of organizing and simplifying accumulated data, which includes editing, reducing the data to a manageable size, summarizing it, identifying patterns, and applying statistical techniques. In this study, the collected data underwent a thorough process of editing, cleaning, and coding to ensure completeness. Once cleaned, the data was analyzed using both descriptive and inferential statistical methods. Descriptive statistics, such as mean, standard deviation, and coefficient of variation (CV), were employed to summarize the data, while inferential statistics were used to test the hypotheses presented in the study. The inferential statistics comprises correlation analysis and multiple regression analysis. The findings of the study were presented inform of tables and charts.

The analytical model is denoted by the equation:

$$Y= \beta_0+\beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \epsilon$$

Equation (ii)

$$Y = \beta_0+ \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + M + \varepsilon$$

Equation (iii)

$$Y = \beta_0+ \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + M + M*X_1 + \varepsilon$$

Equation (iv)

$$Y = \beta_0+ \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + M + M*X_1 + M*X_2 + \varepsilon$$

Equation (v)

$$Y = \beta_0+ \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + M + M*X_1 + M*X_2 + M*X_3+ \varepsilon$$

β_1, $\beta_2$and β_3 are coefficients of the Independent Variables

In which:

Y=Trade Facilitation

X_1 = Cargo clearance system

X_2=Duty computation system

X_3=Customs monitoring system

M=Compliance cost as a moderator

M_1= Cargo clearance system * Compliance cost

M_2= Duty computation system * Compliance cost

M_3 = Customs monitoring system* Compliance cost

β_0=Constant

ϵ = error

3.9 Measurement of Variables

The section presents operationalization of the study variables.

The Independent variable was cargo clearance system which will be measured by containerized cargo clearance and documentation procedure based on a five point Likert scale validated by previous scholars Serete (2019). The independent variable was duty computation system which will be measured by flexible payments and duty confirmation based on a five point Likert scale validated by previous scholars Azmi and Kamarulzaman (2020. The independent variable was customs monitoring system which will be measured by tracking device and real time monitoring based on a five point Likert scale validated by previous scholars Bujak, (2019). The moderating variable was compliance cost which will be measured by demurrage charges and cost of hiring agent based on a five point Likert scale validated by previous scholars

Djankov et al. (2019). The dependent variable was trade facilitation which will be measured by tax paid and volume of goods traded based on a five point Likert scale validated by previous scholars KRA 2023.

Table 3.2: Measurement of Variables

Variable	Indicator/Measure	Authors	Data collection Instrument	Measurement Scale	Types of Analysis
Independent variables Cargo clearance system	Containerized cargo clearance documentation procedure	Serete (2019)	Questionnaire	5 Point Likert Scale	Regression Analysis Correlation Analysis
Duty computation system	Flexible payments Duty confirmation	Azmi and Kamarulzaman (2020)	Questionnaire	5 Point Likert Scale	Regression Analysis Correlation Analysis
Customs monitoring system	Tracking device Real time monitoring	Bujak, (2019)	Questionnaire	5 Point Likert Scale	Regression Analysis Correlation Analysis
Moderator Compliance cost	Demurrage charges Cost of hiring agent	Djankov et al. (2019)	Questionnaire	5 Point Likert Scale	Regression Analysis Correlation Analysis
Dependent Variable Trade Facilitation	Tax paid volume of goods traded	KRA 2023	Questionnaire	5 Point Likert Scale	Regression Analysis Correlation Analysis

(Source: Research 2024)

3.10 Ethical Considerations

According to Mugenda (2003), ensuring the protection of participants' rights and welfare is a fundamental ethical responsibility for all involved in research. For this study, ethical approval was secured from Moi University. Confidentiality was strictly maintained, with respondents' identities kept anonymous. Participants were thoroughly informed about the study's objectives and assured that their responses would be used solely for research purposes. Data collection was conducted without any form of

coercion or undue influence, allowing respondents to voluntarily participate and withdraw at any time without facing any negative repercussions.

CHAPTER FOUR

DATA PRESENTATION, INTERPRETATION AND ANALYSIS.

4.1 Introduction

This chapter involves the comprehensive analysis and interpretation of questionnaire data collected in relation to the objectives of study, which is moderating effect of compliance cost on relationship between integrated customs management system on trade facilitation at Busia border in Kenya.

4.2 Reliability Test

To assess the reliability of the research instruments, internal consistency was measured using Cronbach's Alpha. This coefficient ranges from 0 to 1, with higher values indicating greater reliability. As noted by Mugenda (2008), a Cronbach's Alpha value between 0.6 and 0.7 is generally considered acceptable, while a value of 0.7 or above is regarded as indicating good reliability. Trade facilitation had Cronbach's alpha of 0.923, cargo clearance system had Cronbach's alpha of 0.939, duty computation system had Cronbach's alpha of 0.949, customs monitoring system had Cronbach's alpha of 0.979, lastly compliance cost had Cronbach's alpha of 0.986. The alphas value >0.7 indicating that the responses are highly reliable.

Table 4.1: Reliability Tests

Variable	Cronbach's Alpha	No of Items
Trade Facilitation	0.923	6
Cargo Clearance System	0.939	6
Duty Computation System	0.949	3
Customs Monitoring System	0.979	5
Compliance Cost	0.986	5

(Source: Research 2024)

4.3 Response Rate

The response rate in research indicates the degree of participation and the dependability of the gathered data. A higher response rate enhances the study's accuracy and real-world applicability. Out of 137 respondents targeted, 114 questionnaires were correctly filled and returned indicating 83% response rate. A response rate of 83% achieved in this study is deemed highly satisfactory for drawing conclusions. According to Bailey (2000), a response rate of 50% is considered adequate, while a rate exceeding 70% is classified as very good. Therefore, the 83% response rate in this study is notably robust. Although a 100% response rate would be ideal, it was not reached due to work-related challenges faced by the respondents. The questionnaire was self-administered within a limited timeframe, constrained by the permissions granted for data collection. Figure 4.1 presents summary of respondent details

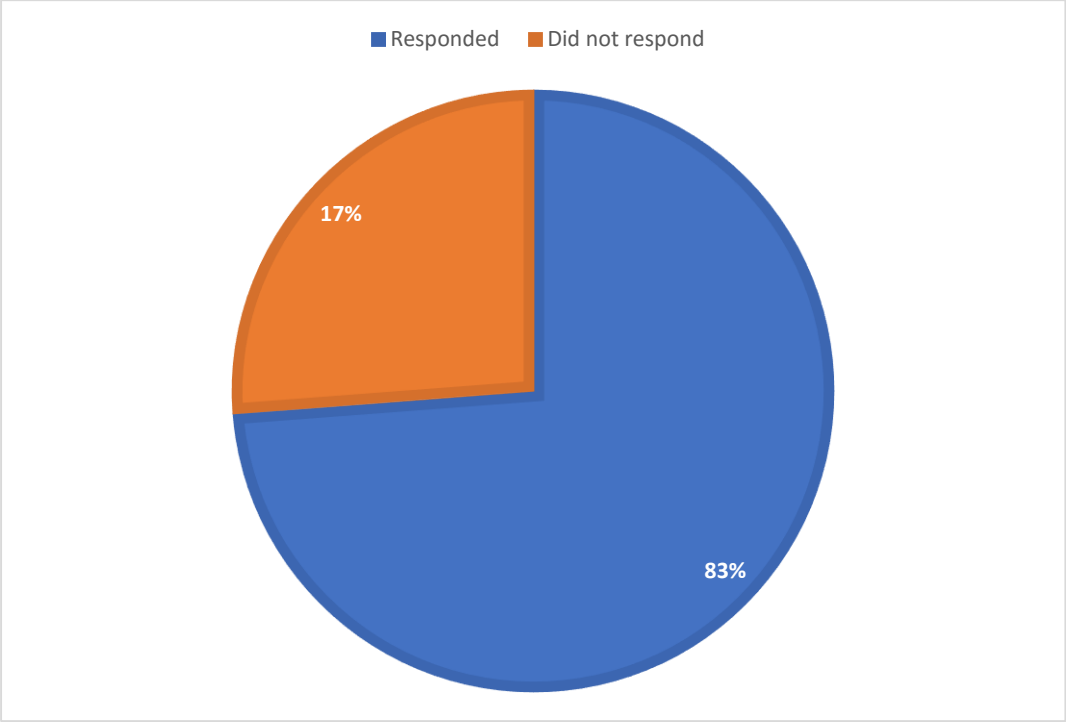

Figure 4.1: Response rate

Source: (Research data 2024)+

4.4 Demographics Analysis

Demographics analysis was conducted to determine

Table 4.2: Demographics Analysis

		Count	Percent %
Gender	Female	53	46.5%
	Male	61	53.5%
Age	26 to 35	16	14.0%
	36 to 45	33	28.9%
	46 to 55	26	22.8%
	Above 55	25	21.9%
	Below 25	14	12.3%
Education	Degree level	47	41.2%
	Diploma level	16	14.0%
	others	27	23.7%
	Secondary Certificate	24	21.1%

(Source: Research 2024)

The demographic analysis presented in Table 4.2 reveals the distribution of participants across various categories. The gender distribution indicates that 53.5% of the respondents are male while 46.5% are female. In terms of age, the largest group falls within the 36 to 45 years range, accounting for 28.9% of the sample. This is followed by participants aged 46 to 55 years at 22.8% those above 55 years at 21.9%. Participants aged 26 to 35 years at 14.0% and those below 25 years at 12.3%. Regarding education levels, 41.2% of the participants hold a degree, 23.7% have other qualifications, 21.1% possess a secondary certificate, and 14.0% have a diploma.

4.5 Descriptive Statistics

The findings of the study were derived using a Likert scale from the questionnaires, where respondents indicated their level of agreement or disagreement with various

statements. Descriptive statistics were then applied to analyze each independent variable or objective, providing a detailed overview of the data collected.

4.5.1 Descriptive Statistics for Cargo Clearance System

Table 4.3 indicates items regarding the cargo clearance system.

Table 4.3: Descriptive statistics cargo clearance system

	N	Mean	Std. Deviation	Skewness	Kurtosis
Cargo clearance System is a complex system that is not easy to use	114	3.89	1.028	-.612	-.329
Cargo clearance System gives accurate reports		4.04	.959	-.623	-.653
The system is reliable and allows for consistent reporting of data without significant glitches		4.00	.941	-.584	-.317
Cargo clearance System is time consuming		3.77	.950	-.407	-.423
We have specific Customs documentation procedures and regulations for cargo		4.05	.911	-.893	.831
The queues for clearance have reduced		4.01	.936	-.743	.340
Aggregate Mean		3.96			

(Source: Research 2024)

The item "Cargo clearance System is a complex system that is not easy to use" received a mean score of 3.89 (SD = 1.028), indicating a general tendency towards agreement, albeit with notable variability in responses. The skewness value of -0.612 suggests a slight negative skew, implying that more respondents found the system complex than simple. The kurtosis of -0.329 indicates a relatively flat distribution, suggesting moderate variability. For the statement "Cargo clearance System gives accurate

reports," the mean score was 4.04 (SD = 0.959), reflecting a general agreement among respondents that the system provides accurate reports. The skewness of -0.623 shows a slight negative skew, indicating that more respondents rated the accuracy positively. The kurtosis value of -0.653 implies a flatter than normal distribution, suggesting a diverse range of responses.

The system is reliable and allows for consistent reporting of data without significant glitches as rated with a mean of 4.00 (SD = 0.941), indicating agreement that the system is reliable and allows for consistent reporting without significant glitches. The skewness of -0.584 indicates a slight negative skew, with more respondents agreeing on the system's reliability. The kurtosis of -0.317 shows a slightly flatter distribution, indicating moderate variability in perceptions of reliability.

The perception that the "Cargo clearance System is time-consuming" received a mean score of 3.77 (SD = 0.950), suggesting that respondents tend to agree that the system is somewhat time-consuming. The skewness value of -0.407 indicates a slight negative skew, showing that more respondents view the system as time-consuming. The kurtosis of -0.423 suggests a relatively flat distribution, implying moderate variability in responses. Respondents showed a strong agreement with the statement "We have specific Customs documentation procedures and regulations for cargo," which had a mean score of 4.05 (SD = 0.911). The skewness of -0.893 indicates a pronounced negative skew, suggesting that many respondents strongly agree with the statement. The kurtosis value of 0.831 shows a distribution with heavier tails, suggesting some extreme responses.

Finally, the statement "The queues for clearance have reduced" received a mean score of 4.01 (SD = 0.936), indicating agreement that the queues have indeed reduced. The

skewness value of -0.743 reflects a negative skew, indicating more respondents agree with the reduction in queues. The kurtosis of 0.340 indicates a distribution slightly more peaked than normal, suggesting a concentration of responses around the mean. Overall, the aggregate mean score across all items was 3.96, showing a general agreement on the positive aspects of the cargo clearance system, despite some variability in specific areas.

4.5.2 Descriptive Statistics for Duty Computation System

Descriptive statistics for the duty computation system was summarized on table 4.4

Table 4.4: Descriptive Statistics Duty Computation System

	N	Mean	Std. Deviation	Skewness	Kurtosis
We can make more clearances on products due to use of duty computation system resulting to more taxes to the KRA.	114	2.99	.939	-.611	-.461
The owners of the goods can pay their duties at the comfort of their homes/offices electronically.		4.75	.887	-.636	-.272
Confirmation of duties paid is confirmed instantly due to the use of duty computation system.		4.24	1.042	-.709	-.763
Aggregate Mean		3.99			

(Source: Research 2024)

We can make more clearances on products due to use of duty computation system resulting to more taxes to the KRA: The mean response for this statement was 2.99 (SD = 0.939), indicating that respondents generally agreed that the duty computation system

results into more taxes. The skewness of -0.611 suggests a slight leftward skew, meaning more respondents rated it higher on the difficulty scale. The kurtosis of -0.461 indicates a relatively flat distribution compared to a normal distribution, showing moderate variability in responses.

The owners of the goods can pay their duties at the comfort of their homes/offices electronically: This statement had a mean of 4.75 (SD = 0.887), showing that participants agreed that the duties can be paid at the comfort of their homes (Likert scale: Agree). The skewness value of -0.636 implies a slight skew to the left, suggesting a tendency towards higher ratings of accuracy. The kurtosis of -0.272 suggests a distribution close to normal, indicating consistent perceptions about the system's accuracy.

Confirmation of duties paid is confirmed instantly due to the use of duty computation system: The mean score for this item was 4.24 (SD = 1.042), indicating that respondents get payment confirmation instantly. The skewness of -0.709 points to a more pronounced leftward skew, showing a trend towards higher agreement. The kurtosis of -0.763 signifies a somewhat flat distribution, indicating variability in how reliability is perceived by different respondents.

4.5.3 Descriptive Statistics for Customs Monitoring System

Descriptive statistics for the customs monitoring system was summarized on table 4.5.

Table 4.5: Descriptive Statistics Customs Monitoring System

	N	Mean	Std. Deviation	Skewness	Kurtosis
Use of customs monitoring system leads to a more efficient and individual container traceability	114	4.03	1.008	-.686	-.675
Customs monitoring system allows real time monitoring of the status of product and goods movements		4.05	1.029	-.801	-.532
Real time remote containers tracking and monitoring help to prevent losing track of container and goods		3.85	1.024	-.601	-.717
Use of customs monitoring system has led to reduction in deterioration theft, diversion and counterfeiting		3.88	1.040	-.614	-.761
The tampered carrier can be inspected away from the destination port to prevent potential negative impact and potential destruction (when high jacked by terrorists		3.82	1.001	-.537	-.718
Aggregate Mean		3.93			

(Source: Research 2024)

For Use of customs monitoring system leads to a more efficient and individual container traceability (M = 4.03, SD = 1.008, Skewness = -0.686, Kurtosis = -0.675): Respondents generally agree that the use of the customs monitoring system enhances container traceability (M = 4.03). The standard deviation (SD = 1.008) indicates

moderate variability in responses. The negative skewness (-0.686) suggests that more respondents rated this statement highly, while the negative kurtosis (-0.675) indicates a relatively flat distribution.

For Customs monitoring system allows real-time monitoring of the status of product and goods movements (M = 4.05, SD = 1.029, Skewness = -0.801, Kurtosis = -0.532): There is strong agreement on the effectiveness of real-time monitoring (M = 4.05), with moderate variability (SD = 1.029). The distribution is negatively skewed (-0.801), showing a tendency towards higher agreement, and the kurtosis (-0.532) indicates a somewhat flat distribution.

For Real-time remote containers tracking and monitoring help to prevent losing track of container and goods (M = 3.85, SD = 1.024, Skewness = -0.601, Kurtosis = -0.717): Respondents generally agree (M = 3.85) that tracking and monitoring help prevent loss, with moderate response variability (SD = 1.024). The negative skewness (-0.601) and negative kurtosis (-0.717) suggest a distribution with more high ratings and a flat shape.

For use of customs monitoring system has led to reduction in deterioration, theft, diversion, and counterfeiting (M = 3.88, SD = 1.040, Skewness = -0.614, Kurtosis = -0.761): There is agreement (M = 3.88) on the reduction of negative outcomes due to the system, with a standard deviation (SD = 1.040) showing moderate variability. The negative skewness (-0.614) suggests more high ratings, while the kurtosis (-0.761) shows a flatter distribution.

For the tampered carrier can be inspected away from the destination port to prevent potential negative impact and potential destruction (when hijacked by terrorists) (M = 3.82, SD = 1.001, Skewness = -0.537, Kurtosis = -0.718): Respondents agree (M = 3.82) on the benefit of inspecting tampered carriers, with moderate variability (SD =

1.001). The distribution is slightly negatively skewed (-0.537) and has a flat shape (Kurtosis = -0.718). Aggregate Mean: The overall mean rating for these items is 3.93, indicating a general agreement that the customs monitoring system is beneficial across various dimensions.

4.5.4 Descriptive Statistics for Compliance Cost

Descriptive statistics for the compliance cost was summarized on table 4.6.

Table 4.6: Descriptive Statistics Compliance Cost

	N	Mean	Std. Deviation	Skewness	Kurtosis
I incur demurrage charges	114	3.99	1.052	-.726	-.506
There is Time lost in tax calculations		4.10	1.064	-.744	-.566
Actual tax payable affects trade facilitation		4.09	1.063	-.781	-.510
I incur Cost of hiring professionals		3.79	1.059	-.560	-.734
Hiring staff to do tax calculations and record keeping is costly		4.13	1.067	-.792	-.513
Aggregate Mean		4.02			

(Source: Research 2024)

I incur demurrage charges: The mean score for this item was 3.99, with a standard deviation of 1.052. The skewness was -0.726, indicating a moderate negative skew, suggesting that responses were slightly skewed towards higher agreement levels. The kurtosis was -0.506, indicating a distribution that is slightly flatter than a normal distribution. There is Time lost in tax calculations. This item had a mean score of 4.10 and a standard deviation of 1.064. The skewness was -0.744, showing a moderate

negative skew, meaning that responses leaned towards higher agreement. The kurtosis of -0.566 suggests a relatively flat distribution.

For Actual tax payable affects trade facilitation: The mean score was 4.09 with a standard deviation of 1.063. The skewness of -0.781 indicates a moderate negative skew, implying that respondents tended to agree more with the statement. The kurtosis was -0.510, signifying a distribution that is somewhat flatter than normal. I incur Cost of hiring professionals: This item had a mean score of 3.79 and a standard deviation of 1.059. The skewness was -0.560, showing a slight negative skew, indicating a mild tendency towards agreement. The kurtosis was -0.734, suggesting a flatter distribution compared to a normal distribution.

Hiring staff to do tax calculations and record keeping is costly: The mean score was 4.13 with a standard deviation of 1.067. The skewness was -0.792, indicating a moderate negative skew, with more responses in agreement with the statement. The kurtosis was -0.513, indicating a distribution that is slightly flatter than normal. Overall, the aggregate mean for these items was 4.01, suggesting that, on average, respondents tend to agree that various compliance costs affect trade facilitation.

4.5.5 Descriptive Statistics for Trade Facilitation

Descriptive statistics for the trade facilitation was summarized on table 4.7.

Table 4.7: Descriptive Statistics Trade Facilitation

	N	Mean	Std. Deviation	Skewness	Kurtosis
Volumes of cargo traded across the border have increased	114	3.59	1.009	-.825	.088
KRA has offered an enabling environment for tax filing		3.98	1.004	-.818	.105
Companies file returns on time and as required by law		4.12	.973	-.839	.312
Lodging and processing of Customs declaration have been made easier and transparent		3.96	.959	-.930	.586
Lodgment and processing of the Imports declaration form has improved significantly.		4.28	.922	-.795	.550
Time taken to declare goods to Customs has reduced significantly		4.05	.891	-.945	1.128
Aggregate Mean		3.99			

(Source: Research 2024)

For the item "Volumes of cargo traded across the border have increased," the mean score is 3.59, indicating that respondents generally agree with this statement. The standard deviation of 1.009 suggests a moderate level of variability in responses. The skewness is -.825, indicating a leftward (negative) skew, and the kurtosis is .088, suggesting a distribution close to normal.

The statement "KRA has offered an enabling environment for tax filing" has a mean score of 3.98, showing that respondents agree. The standard deviation is 1.004, which

implies moderate variability in responses. The skewness of -.818 indicates a leftward skew, while the kurtosis of .105 shows a distribution close to normal. For "Companies file returns on time and as required by law," the mean score is 4.12, indicating agreement among respondents. The standard deviation is .973, suggesting moderate variability. The skewness is -.839, showing a leftward skew, and the kurtosis is .312, indicating a slightly peaked distribution.

The statement "Lodging and processing of Customs declaration have been made easier and transparent" has a mean score of 3.96, reflecting general agreement. The standard deviation of .959 suggests moderate variability. The skewness is -.930, indicating a leftward skew, and the kurtosis of .586 suggests a more peaked distribution. For "Lodgment and processing of the Imports declaration form has improved significantly," the mean score is 4.28, indicating agreement. The standard deviation is .922, showing moderate variability. The skewness is -.795, indicating a leftward skew, and the kurtosis is .550, suggesting a more peaked distribution. Lastly, the item "Time taken to declare goods to Customs has reduced significantly" has a mean score of 4.05, indicating agreement among respondents. The standard deviation is .891, implying moderate variability. The skewness is -.945, showing a leftward skew, and the kurtosis of 1.128 indicates a more peaked distribution. Overall, the aggregate mean score for these items is 3.99, suggesting that respondents generally agree that trade facilitation measures have been effective.

4.6 Factor Analysis

Factor analysis is a useful technique for examining data to identify patterns, validating hypotheses, or simplifying a large number of variables into a more manageable set. It acts as a data reduction tool by eliminating redundancy or duplication among correlated

variables and representing these correlated variables with a smaller number of derived variables (Mayer, 2006).

4.6.1 KMO and Bartlett's Tests

The KMO and Bartlett's tests were conducted in order to determine the suitability of factor analysis.

Table 4.8: KMO& Bartlett's test

	Trade Facilitation	**Cargo Clearance System**	**Duty Computation System**	**Customs Monitoring System**	**Compliance Cost**
KMO	0.780	0.839	0.717	0.831	0.886
Bartlett's test for sphericity (sig)	0.000	0.000	0.000	0.000	0.000

(Source: Research 2024)

The results from Table 4.8, which includes the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity, provide valuable insights into the suitability of the variables for factor analysis. For Trade Facilitation, the KMO value is 0.780, which is considered good as it is above the 0.7 threshold generally deemed acceptable for factor analysis. This indicates that the partial correlations among the variables are relatively low, suggesting that factor analysis is appropriate for this variable. Bartlett's test for sphericity yields a p-value of 0.000, which is highly significant. This result supports the suitability of Trade Facilitation for factor analysis, as it confirms that the correlation matrix is not an identity matrix and thus is factorable. Cargo Clearance System has a KMO value of 0.839, which is excellent and well above the acceptable threshold. This high KMO value suggests that the variable is highly suitable for factor analysis, indicating that the correlations among the variables are

strong enough to justify the analysis. The Bartlett's test p-value of 0.000 reinforces this conclusion, showing that the data is appropriate for factor analysis due to the significant correlations present.

The Duty Computation System shows a KMO value of 0.717, which is still acceptable but on the lower end of the scale. This suggests that while factor analysis is feasible, the correlations among variables might not be as strong as those in variables with higher KMO values. Bartlett's test, with a p-value of 0.000, indicates that the correlation matrix for Duty Computation System is significantly different from an identity matrix, confirming its appropriateness for factor analysis.

For the Customs Monitoring System, the KMO value is 0.831, which is also high and indicates that the variable is suitable for factor analysis. This value suggests strong inter-correlations among the variables, making factor analysis a valid technique. Bartlett's test p-value of 0.000 further supports this, affirming that the correlations are significant and not due to chance. Lastly, Compliance Cost has the highest KMO value of 0.886, which is very good and suggests that the variable is highly appropriate for factor analysis. The high KMO value indicates that the correlations among the variables are substantial. With Bartlett's test p-value of 0.000, the suitability of Compliance Cost for factor analysis is confirmed, as the test shows significant correlations that justify the factor analysis.

4.6.2 Convergent Validity test

Convergence validity evaluates if items that are theoretically intended to measure the same construct actually do so. Based on the subsequent TF = trade facilitation, CCS = cargo clearance system, DCS = duty computation system, CMS = customs monitoring

system, CC = Compliance cost the threshold for acceptable convergent validity is typically considered to be correlations above 0.70.

Table 4.9: Convergence Validity

		TF1	TF2	TF3	TF4	TF5	TF6
	TF1	1.000	.996	.947	.202	.847	.897
	TF2	.996	1.000	.960	.203	.851	.891
	TF3	.947	.960	1.000	.189	.878	.908
	TF4	.202	.203	.189	1.000	.170	.164
	TF5	.847	.851	.878	.170	1.000	.915
	TF6	.897	.891	.908	.164	.915	1.000
		CCS1	CCS2	CCS3	CCS4	CCS5	CCS6
	CCS1	1.000	.570	.704	.707	.753	.783
	CCS2	.570	1.000	.500	.640	.525	.621
	CCS3	.704	.500	1.000	.742	.713	.704
	CCS4	.707	.640	.742	1.000	.628	.659
	CCS5	.753	.525	.713	.628	1.000	.934
	CCS6	.783	.621	.704	.659	.934	1.000
		DCS1	DCS2	DCS3			
Correlation	DCS1	1.000	.701	.590			
	DCS2	.701	1.000	.650			
	DCS3	.590	.650	1.000			
		CMS1	CMS2	CMS3	CMS4	CMS5	
	CMS1	1.000	.775	.647	.619	.610	
	CMS2	.775	1.000	.696	.684	.688	
	CMS3	.647	.696	1.000	.971	.958	
	CMS4	.619	.684	.971	1.000	.947	
	CMS5	.610	.688	.958	.947	1.000	
		CC1	CC2	CC3	CC4	CC5	
	CC1	1.000	.831	.847	.873	.852	
	CC2	.831	1.000	.977	.860	.973	
	CC3	.847	.977	1.000	.878	.988	
	CC4	.873	.860	.878	1.000	.883	
	CC5	.852	.973	.988	.883	1.000	

(Source: Research 2024)

Table 4.9 shows that for the Trade Facilitation (TF) construct, correlations among items TF1 through TF6 ranged from 0.202 to 0.996. Notably, TF1 and TF2 showed a very high correlation of 0.996, and other pairs like TF3 and TF6 also demonstrated strong

correlations (0.908). However, correlations involving TF4 were notably lower, with values ranging from 0.164 to 0.202, indicating potential issues with its alignment with the TF construct. Given these issues, TF4 was excluded from further analysis to maintain the integrity and clarity of the Trade Facilitation construct. By removing TF4, the study ensures that only items with high loadings, which consistently reflect the intended construct, contribute to the mean score calculations for Trade Facilitation. This step improves the internal consistency and construct validity of the Trade Facilitation variable, enhancing the reliability of the study's measurements and ensuring that the derived conclusions more accurately reflect the intended theoretical constructs.

In the Cargo Clearance System (CCS) construct, item correlations varied between 0.500 and 0.934. Items CCS1 and CCS6 exhibited strong convergent validity with a correlation of 0.783, while the correlation between CCS1 and CCS2 was notably lower at 0.570. Despite this, most correlations exceeded the 0.70 threshold, suggesting generally acceptable convergent validity for the CCS construct.

The Duty Computation System (DCS) showed moderate correlations ranging from 0.590 to 0.701 among its items (DCS1, DCS2, DCS3). These values are close to the 0.70 threshold, indicating that while there is some degree of convergent validity, it may not be as strong as desired. For the Customs Monitoring System (CMS), correlations ranged from 0.610 to 0.971. Particularly high correlations were observed between CMS3 and CMS4 (0.971) and between CMS3 and CMS5 (0.958). These high values suggest robust convergent validity for the CMS construct.

Finally, the Compliance Cost (CC) construct displayed exceptionally high correlations among its items, ranging from 0.831 to 0.988. The correlation between CC2 and CC3 was the highest at 0.977, indicating excellent convergent validity for this construct.

4.6.3 Factor Loadings

Khosla (2006) suggests that dimensionality algorithms aim to provide a clearer and more precise depiction of multi-variate data by removing redundant elements. Selecting appropriate inputs for classification and regression helps to streamline the data.

Table 4.10: Principal Component Factor Analysis

	Trade Facilitation	Cargo Clearance System	Duty Computation System	Customs Monitoring System	Compliance Cost
TF1	.974				
TF2	.976				
TF3	.974				
TF4	.242				
TF5	.930				
TF6	.955				
CCS1		.883			
CCS2		.736			
CCS3		.851			
CCS4		.848			
CCS5		.894			
CCS6		.920			
DCS1			.874		
DCS2			.900		
DCS3			.850		
CMS1				.797	
CMS2				.845	
CMS3				.958	
CMS4				.948	
CMS5				.944	
CC1					.918
CC2					.970
CC3					.981
CC4					.937
CC5					.982

(Source: Research 2024)

Each factor is constructed based on the loadings of the observed variables on the principal components as per table 4.10. The Trade Facilitation factor is characterized

by high loadings on variables TF1, TF2, TF3, TF5, and TF6, with values ranging from 0.930 to 0.976. This indicates that these variables share a common underlying dimension related to trade facilitation processes. Specifically:TF1 (0.974), TF2 (0.976), TF3 (0.974), and TF6 (0.955) all have very high loadings, suggesting they are strongly associated with trade facilitation measures. TF4 (0.242) has a substantially lower loading, indicating it does not contribute significantly to this factor and might be unrelated to the dimension of Trade Facilitation. These variables were likely constructed to assess various aspects of trade facilitation, including procedural efficiency, logistics support, and infrastructure effectiveness.

The Cargo Clearance System factor includes variables CCS1, CCS2, CCS3, CCS4, CCS5, and CCS6, with loadings ranging from 0.736 to 0.920. This factor represents the effectiveness and efficiency of cargo clearance processes. Specifically: CCS1 (0.883), CCS3 (0.851), CCS4 (0.848), CCS5 (0.894), and CCS6 (0.920) have high loadings, indicating a strong relationship with cargo clearance efficiency. CCS2 (0.736) has a somewhat lower loading but still contributes to the Cargo Clearance System factor. These variables are likely designed to measure various components of cargo clearance, such as processing times, procedural simplicity, and overall system performance.

The Duty Computation System factor is represented by variables DCS1, DCS2, and DCS3, with loadings ranging from 0.850 to 0.900. This indicates that these variables are associated with the effectiveness of duty computation mechanisms. Specifically: DCS1 (0.874), DCS2 (0.900), and DCS3 (0.850) demonstrate high loadings, reflecting their strong association with duty computation accuracy and efficiency. These variables were likely constructed to assess the accuracy, reliability, and efficiency of duty computation processes.

The Customs Monitoring System factor includes variables CMS1, CMS2, CMS3, CMS4, and CMS5, with loadings ranging from 0.797 to 0.958. This factor pertains to the effectiveness of customs monitoring systems. Specifically: CMS3 (0.958), CMS4 (0.948), and CMS5 (0.944) have the highest loadings, indicating a strong relationship with customs monitoring effectiveness. CMS1 (0.797) and CMS2 (0.845) also contribute to this factor but with slightly lower loadings. These variables were likely constructed to measure the various aspects of customs monitoring, including surveillance, compliance checking, and enforcement effectiveness.

The Compliance Cost factor is represented by variables CC1, CC2, CC3, CC4, and CC5, with loadings ranging from 0.918 to 0.982. This factor measures the costs associated with compliance. Specifically: CC5 (0.982), CC3 (0.981), and CC2 (0.970) have the highest loadings, indicating a strong relationship with compliance costs. CC1 (0.918) and CC4 (0.937) also show high loadings, reflecting their significant role in assessing compliance-related expenses. These variables were likely designed to evaluate different dimensions of compliance costs, such as administrative expenses, financial burdens, and resource allocation.

A cutoff point in a Principal Component Factor Analysis typically refers to the minimum loading value that determines whether an item (variable) significantly contributes to a factor. For this analysis, we should assume a common threshold of 0.7. Loewen (2015). The Trade Facilitation factor is constructed using items TF1, TF2, TF3, TF5, and TF6, all of which have loadings above the cutoff point of 0.7. Item TF4, with a loading of 0.242, does not significantly contribute to this factor. The Cargo Clearance System factor is constructed using items CCS1, CCS2, CCS3, CCS4, CCS5, and CCS6. All items have loadings above the cutoff of 0.7, meaning they all significantly contribute to this factor. The Customs Monitoring System factor is constructed using

items CMS1, CMS2, CMS3, CMS4, and CMS5. All items have loadings above the cutoff of 0.7, showing that they contribute significantly to this factor. The Compliance Cost factor is constructed using items CC1, CC2, CC3, CC4, and CC5. All items have loadings above the cutoff of 0.7, meaning they significantly contribute to this factor.

4.6.4 Data transformation

In the process of transforming items into variables for a principal component analysis, each item with a factor loading above a specified cutoff, in this case, 0.6, is retained within its respective component grouping. Factor loadings indicate the correlation between each item and the underlying latent variable (factor). Higher factor loadings (above the cutoff) imply a strong association with the corresponding factor, justifying the inclusion of that item in the variable computation for each factor.

To compute the mean of the responses for each variable (e.g., "Trade Facilitation," "Cargo Clearance System"), only the items that meet the factor loading criterion of ≥ 0.6 are included. The formula for calculating the mean response score for each factor is expressed as follows

$$\text{Mean}_{\text{Factor}} = \frac{\sum_{i=1}^{n} X_i}{n}$$

where:

- $\text{Mean}_{\text{Factor}}$ is the average score for the factor (e.g., "Trade Facilitation" or "Cargo Clearance System").
- X_i represents the response value for each item i associated with the factor, and n is the total number of items with factor loadings above 0.6 within that factor.

Applying this to each component, the items retained and subsequently averaged for each variable are as follows:

Trade Facilitation: Includes items TF1, TF2, TF3, TF5, and TF6, with all loadings above 0.6. Thus, the mean for Trade Facilitation (Mean $_{TF}$) is calculated by averaging the responses for TF1, TF2, TF3, TF5, and TF6.

Cargo Clearance System: Comprises items CCS1, CCS2, CCS3, CCS4, CCS5, and CCS6, all meeting the factor loading criterion. The mean for Cargo Clearance System (Mean $_{CCS}$) is the average of these items' responses.

Duty Computation System: Includes items DCS1, DCS2, and DCS3, each with factor loadings above 0.6, so the mean for Duty Computation System (Mean $_{DCS}$) is derived from these responses. Customs Monitoring System: Consists of items CMS1, CMS2, CMS3, CMS4, and CMS5, which all surpass the loading cutoff. The mean for Customs Monitoring System (Mean $_{CMS}$) is calculated by averaging these item responses.

Compliance Cost: Includes items CC1, CC2, CC3, CC4, and CC5, all with factor loadings above 0.6. Thus, the mean for Compliance Cost (Mean $_{CC}$) is the average of these responses.

4.7 Statistical Assumptions

Statistical Diagnostic tests for normality, linearity, heteroscedasticity, and multicollinearity.

4.7.1 Test for Normality

The Shapiro-Wilk test was used to assess the normality of the data distribution. This test evaluates whether the data follows a normal distribution, with the assumption that if the P-value is greater than 0.05, the data is normally distributed. Specifically, if the test statistic is not significant, it indicates that the variable's distribution is not significantly different from a normal distribution, according to Garson (2012).

Table 4.11: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**Df**	**Sig.**	**Statistic**	**df**	**Sig.**
Cargo Clearance System	.174	114	.062	.846	114	.075
Duty Computation System	.235	114	.054	.824	114	.066
Customs Monitoring System	.199	114	.781	.844	114	.081
Compliance Cost	.260	114	.665	.755	114	.066

a. Lilliefors Significance Correction

(Source: Research 2024)

Table 4.11 found that cargo clearance system has p-value of 0.075>0.05, duty computation system has a p-value of 0.066>0.05. Customs monitoring system has a p-value of 0.081>0.05. Lastly compliance costs have a p-value of 0.066>0.05. This implies that variable's distribution is not significantly different from normal.

4.7.2 Homoscedasticity Test

The homoscedasticity test examines whether the error terms in a regression model maintain a consistent variance across all levels of the independent variables. It assesses the assumption that the spread of residuals remains uniform, regardless of the values of the predictors. Garson, (2012).

Table 4.12: Homoscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.277766	Prob. F (4,109)	0.8918
Obs*R-squared	1.150303	Prob. Chi-Square (4)	0.8862
Scaled explained SS	1.373620	Prob. Chi-Square (4)	0.8488

(Source: Research 2024)

Table 4.12 shows that the p-value 0.8918>0.05 which implies that there is constant variance across all level of the independent variables.

4.7.3 Linearity Test

The assumption for linearity was measured through a deviation from linearity metric. Csorgo (1985) elaborated that Ramsey RESET test's p value of deviation from linearity >0.05 the assumption of linearity is not violated, if the p value is <=0.05 the assumption for linearity has been violated.

Table 4.13: Ramsey RESET Test: Squares of Fitted Values

	Value	**Df**	**Probability**
t-statistic	1.591028	108	0.1145
F-statistic	2.531370	(1, 108)	0.1145
Likelihood ratio	2.641169	1	0.1041

(Source: Research 2024)

Table 4.13 shows a F statistic of 2.531370 p-value =0.1145>0.05, which implied that the relationship between the predictor variable and the dependent variable was linear.

4.7.4 Multicollinearity Test

Multicollinearity issues are indicated if the variance inflation factor (VIF) exceeds 10 and tolerance values are below 0.1, as suggested by Collis and Hussey (2014). To detect multicollinearity, the variance inflation factor was calculated.

Table 4.14: Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Cargo Clearance System	0.004	16.277	1.576
Duty Computation System	0.004	18.337	1.595
Customs Monitoring System	0.004	17.899	1.609
Compliance Cost	0.002	4.7487	1.259

(Source: Research 2024)

Table 4.14 shows the centred VIF values for each of the independent variables and the moderator, cargo clearance system showed VIF of 1.576<10, duty computation showed a VIF of 1.595<10, customs monitoring system showed a VIF of 1.609<10, and lastly compliance cost had a VIF of 1.259<10. The VIFs for the variables show that there is low levels of correlation between the variable thus the assumption of multicollinearity was not violated.

4.8 Correlation Analysis

Pearson's correlation coefficients were examined to measure the strength of the relationship between independent variables. A value closer to 1 indicates a stronger correlation between the two variables.

Table 4.15: Correlation Analysis

		TFC	CCS	DCS	CMS	CPC
Trade Facilitation	r	1				
	Sig.					
Cargo Clearance System	r	0.597	1			
	Sig.	0.000**				
Duty Computation System	r	0.505	0.216	1		
	Sig.	0.003**	0.000**			
Customs Monitoring System	r	0.573	0.113	0.456	1	
	Sig.	0.002**	0.001**	0.000**		
Compliance Cost	r	-0.779	-0.246	-0.396	0.421	1
	Sig.	0.000**	0.000**	0.002**	0.000**	
	N	114				

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

(Source: Research 2024)

Table 4.15 shows that cargo clearance system has a positive and significant correlation to trade facilitation at 59.7% p-value =0.000<0.05. This suggests that improvements in the cargo clearance process, such as faster processing times and reduced bureaucratic hurdles, are significantly associated with enhanced trade facilitation. Further the matrix showed that duty computation system has a positive and significant correlation to trade facilitation at 50.5% p-value =0.003<0.05. This indicates a moderately strong relationship where accurate and transparent duty computation contributes to better trade facilitation.

Customs monitoring system has a positive and significant correlation to trade facilitation at 57.3% p-value =0.002<0.05. This suggests that robust customs monitoring, which includes tracking and inspection processes, is crucial for facilitating trade. Lastly compliance costs has a significantly negative correlation to trade facilitation at -77.9% p-value =0.000<0.05. This strong negative correlation indicates that higher compliance costs are associated with lower levels of trade facilitation.

4.9 Regression Analysis

Regression analysis to determine the direct effect of integrated customs management system on trade facilitation.

4.9.1 Model Summary

The model summary was used to determine the correlation and variation caused on trade facilitation.

Table 4.16: Model Summary Without Moderation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.659	0.434	0.418	0.931776

a. Predictors: (Constant), customs monitoring system, cargo clearance system, duty computation system

The model summary from Table 4.16 reveals that the cargo clearance system, duty computation system and customs monitoring system, collectively have a strong and significant impact on trade facilitation at 65.9%, explaining 43.4% of its variability. The remaining 56.6 of the variability was explained by factors not captured in the model, the adjusted R Square 41.8% indicates that this relationship remains robust after accounting for the number of predictors.

4.9.2 Analysis of Variance

The ANOVA was employed to analyze whether the model significantly explains the variability caused on trade facilitation by the predictor variables.

Table 4.17: ANOVA Without Moderation

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	73.129	3	24.376	28.082	0.000
	Residual	95.503	110	.868		
	Total	168.632	113			

a. Dependent Variable: trade facilitation
b. Predictors: (Constant), customs monitoring system, cargo clearance system, duty computation system

Table 4.17 shows that the regression model is significant in explain the variability caused on trade facilitation by cargo clearance system, duty computation system and customs monitoring system. F-statistic =28.082 p-value =0.000<0.05.

4.9.3 Regression Coefficient Analysis

The regression coefficient analysis was summarized through a regression equation as follows;

$Y= 0.633+0.264X_1 + 0.185X_2 + 0.347X_3$

Table 4.18: Standardized Coefficients without Moderator

Model		Standardized Coeff β	Std. Error	Unstandardized Coeff β	t	Sig.
1	(Constant)	0.633	0.310		2.042	0.040
	cargo clearance system	0.264	0.094	0.279	2.809	0.003
	duty computation system	0.185	0.091	0.194	2.033	0.040
	customs monitoring system	0.347	0.094	0.369	3.691	0.000

(Source: Research 2024)

Table 4.18 showed that a unit change in cargo clearance system caused a significant increase of 0.264 in trade facilitation. Further investigation showed that a significant

and increase of 0.185 on trade facilitation was caused by unit changes in duty computation systems. Lastly a unit change in customs monitoring system caused a significant increase of 0.347 in trade facilitation.

4.10 Hierarchical Regression Analysis

The hierarchical regression analysis was used to determine the moderating effect of compliance cost on relationship between cargo clearance system, duty computation system and customs monitoring system and trade facilitation at Busia border in Kenya.

4.10.1 Model Summary with Moderator

The model summary as conducted to investigate the correlation and variation caused on trade facilitation, by cargo clearance system, duty computation system and customs monitoring system, and compliance costs.

Table 4.19: Model Summary with Moderator

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.659	0.434	0.418	0.931776	.434	28.082	3	110	.000
2	0.852	0.726	0.715	0.651745	.292	115.834	1	109	.000
3	0.854	0.729	0.716	0.650687	.003	2.355	1	108	.047
4	0.857	0.734	0.718	0.649116	.004	3.523	1	107	.020
5	0.856	0.733	0.715	0.652154	.000	2.005	1	106	.041

e. Predictors: (Constant), customs monitoring system, cargo clearance system, duty computation system, compliance cost, ccs_cc, dcs_cc, cms_cc

(Source: Research 2024)

4.20 showed that there was a model 1 showed that the reveals that the cargo clearance system, duty computation system and customs monitoring system, collectively have a strong and significant impact on trade facilitation at 65.9%, explaining approximately 43.4% of its variability. Model 5 showed that there was a strong positive correlation after moderating through compliance cost, at 85.6%, collectively the predicators accounted for 73.3% variable on trade facilitation, the remaining 26.7% was caused by factors not captured in the model.

4.10.2 Analysis of Variance with Moderation

The ANOVA model was summarized in table 4.20.

Table 4.20: ANOVA with Moderation

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	73.129	3	24.376	28.077	0.000
	Residual	95.503	110	0.868		
	Total	168.632	113			
2	Regression	122.411	4	30.603	72.168	0.000
	Residual	46.221	109	0.424		
	Total	168.632	113			
3	Regression	122.986	5	24.597	58.198	0.000
	Residual	45.646	108	0.423		
	Total	168.632	113			
4	Regression	123.563	6	20.594	48.892	0.000
	Residual	45.069	107	0.421		
	Total	168.632	113			
5	Regression	123.563	7	17.652	41.516	0.000
	Residual	45.069	106	0.425		
	Total	168.632	113			

a. Dependent Variable: trade facilitation
f. Predictors: (Constant), customs monitoring system, cargo clearance system, duty computation system, compliance cost, ccs_cc, dcs_cc, cms_cc
(Source: Research 2024)

The ANOVA table 4.20 showed that the overall hierarchical model was significant in explaining the variation caused on trade facilitation. The F-statistic =41.516, and p-value =0.000<0.05.

4.10.3 Hierarchical Regression Coefficient Analysis

According to Baron and Kenny (1986), the hierarchical model process for moderation involves three distinct steps: First, establish whether there is a relationship between the independent variables (cargo clearance system, duty computation system, and customs monitoring system) and the dependent variable (trade facilitation) without considering the moderating variable. Next, include the moderator (compliance cost) in the regression model and test whether it has a significant effect on the customs duty compliance. Then, create interaction terms by multiplying each independent variable with the moderator (cargo clearance system * compliance cost, duty computation system * compliance cost, and customs monitoring system * compliance cost). Test the effects of these interaction terms by regressing each one hierarchically, from the first to the last, and check for significant effects. Finally, conclude by testing the regression model with all the interaction terms included to determine the significance of these terms. If the p-values are less than 0.05, it indicates a significant moderating effect of compliance cost on the relationship between the independent variables and trade facilitation.

The regression models were
Equation (i)

$$Y= 0.633+0.279X_1 + 0.194X_2 + 0.369X_3$$

Equation (ii)

$$Y = 3.116+ 0.171X_1 + 0.128X_2 + 0.170X_3 – 0.606M$$

Equation (iii)

$$Y = 3.062+ 0.161X_1 + 0.138X_2 + 0.182X_3 – 0.617M – 0.062M*X_1$$

Equation (iv)

$$Y = 3.018+ 0.177X_1 + 0.137X_2 + 0.176X_3 – 0.618M – 0.008M*X_1 – 0.083M*X_2$$

Equation (v)

$Y = 3.016 + 0.179X_1 + 0.137X_2 + 0.176X_3 - 0.618M - 0.006M*X_1 - 0.081M*X_2 - 0.005M*X_3$

Table 4.21: Regression Coefficients Analysis

Model		standardized Coefficients		Unstandardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.633	0.310		2.042	0.040
	cargo clearance system	0.264	0.094	0.279	2.809	0.003
	duty computation system	0.185	0.091	0.194	2.033	0.040
	customs monitoring system	0.347	0.094	0.369	3.691	0.000
2	(Constant)	3.116	0.335		9.301	0.000
	cargo clearance system	0.171	0.067	0.181	2.552	0.007
	duty computation system	0.128	0.057	0.134	2.246	0.045
	customs monitoring system	0.170	0.068	0.181	2.500	0.007
	compliance cost	-0.606	0.053	-0.576	-11.434	0.000
3	(Constant)	3.062	0.337		9.086	0.000
	cargo clearance system	0.161	0.067	0.171	2.403	0.012
	duty computation system	0.138	0.067	0.144	2.060	0.033
	customs monitoring system	0.182	0.069	0.193	2.638	0.005
	compliance cost	-0.617	0.054	-0.586	-11.426	0.000
	CCS*CC	-0.062	0.024	-0.075	-2.583	0.040
4	(Constant)	3.018	0.338		8.929	0.000
	cargo clearance system	0.177	0.068	0.188	2.603	0.007
	duty computation system	0.137	0.067	0.144	2.045	0.033
	customs monitoring system	0.176	0.069	0.188	2.551	0.008
	compliance cost	-0.618	0.054	-0.587	-11.444	0.000
	CCS*CC	-0.008	0.003	-0.010	-2.667	0.006
	DCS*CC	-0.083	0.041	-0.097	-2.024	0.042
5	(Constant)	3.016	0.340		8.871	0.000
	cargo clearance system	0.179	0.070	0.189	2.557	0.008
	duty computation system	0.137	0.067	0.144	2.045	0.034
	customs monitoring system	0.176	0.069	0.187	2.551	0.008
	compliance cost	-0.618	0.055	-0.587	-11.236	0.000
	CCS*CC	-0.006	0.001	-0.007	-6.000	0.000
	DCS*CC	-0.081	0.023	-0.095	-3.522	0.004
	CMS*CC	-0.005	0.001	-0.006	-5.000	0.000

a. Dependent Variable: trade facilitation

Table 4.22 showed that a unit change in cargo clearance system caused a significant increase of 0.179 in trade facilitation. Further investigation showed that a significant and increase of 0.137 on trade facilitation was caused by unit changes in duty computation systems. A unit change in customs monitoring system caused a significant increase of 0.176 in trade facilitation. Further investigation showed that a unit change in compliance cost caused a significant decrease of -0.618 in trade facilitation. The study further found that a unit change in the interaction between cargo clearance system and compliance cost caused a significant decrease of -0.006 in trade facilitation. The study further showed that a unit change in the interaction between duty computation systems and compliance cost caused a significant decrease of -0.081 in trade facilitation. Lastly, the study showed that a unit change in the interaction between customs monitoring system and compliance cost caused a significant decrease of -0.005 in trade facilitation.

4.11 Hypotheses Tests

The summary of the hypothesis's tests was summarized on table 4.22.

Table 4.22: Summary of Hypotheses Testing

Hypotheses	P-value	Verdict
H_{01} Cargo clearance system has no significant effect on trade facilitation at Busia border, Kenya	0.008	**Reject**
H_{02} Duty computation system has no significant effect on trade facilitation at Busia border, Kenya	0.034	**Reject**
H_{03} Customs monitoring system has no significant effect on trade facilitation at Busia border, Kenya	0.008	**Reject**
H_{04a} Compliance cost has no significant moderating effect on the relationship between cargo clearance system and trade facilitation at Busia border, Kenya	0.000	**Reject**
H_{04b} Compliance cost has no significant moderating effect on the relationship between duty computation system and trade facilitation at Busia border, Kenya	0.004	**Reject**
H_{04c} Compliance cost has no significant moderating effect on the relationship between customs monitoring system and trade facilitation at Busia border, Kenya	0.000	**Reject**

(Source: Research 2024)

Table 4.22 showed that in regards to the first null hypothesis, cargo clearance system has no significant effect on trade facilitation at Busia border, Kenya. The study found that cargo clearance system has a significant effect on trade facilitation at Busia border, Kenya. p-value =0.008<0.05. The null hypothesis was rejected.

The second null hypothesis was that duty computation system has no significant effect on trade facilitation at Busia border, Kenya. The study found that duty computation system has a significant effect on trade facilitation at Busia border, Kenya. p-value =0.034<0.05. The null hypothesis was rejected.

The third null hypothesis was that customs monitoring system has no significant effect on trade facilitation at Busia border, Kenya. The study found that customs monitoring system has a significant effect on trade facilitation at Busia border, Kenya. p-value =0.034<0.05. The null hypothesis was rejected.

The fourth hypotheses were that compliance cost has no significant moderating effect on the relationship between cargo clearance system and trade facilitation at Busia border, Kenya. The study found that compliance cost moderates the relationship between cargo clearance system and trade facilitation. p-value =0.000<0.05. The null hypothesis was rejected.

The hypothesis that compliance cost has no significant moderating effect on the relationship between duty computation system and trade facilitation at Busia border, Kenya. The study found that compliance cost moderates the relationship between duty computation system and trade facilitation. p-value =0.004<0.05. The null hypothesis was rejected. Lastly for the hypothesis that compliance cost has no significant moderating effect on the relationship between customs monitoring system and trade facilitation at Busia border, Kenya. The study found that compliance cost moderates the relationship between customs monitoring system and trade facilitation. p-value =0.000<0.05. The null hypothesis was rejected.

4.12 Moderating Effects Analysis

Interaction Between Cargo Clearance System and Compliance Costs

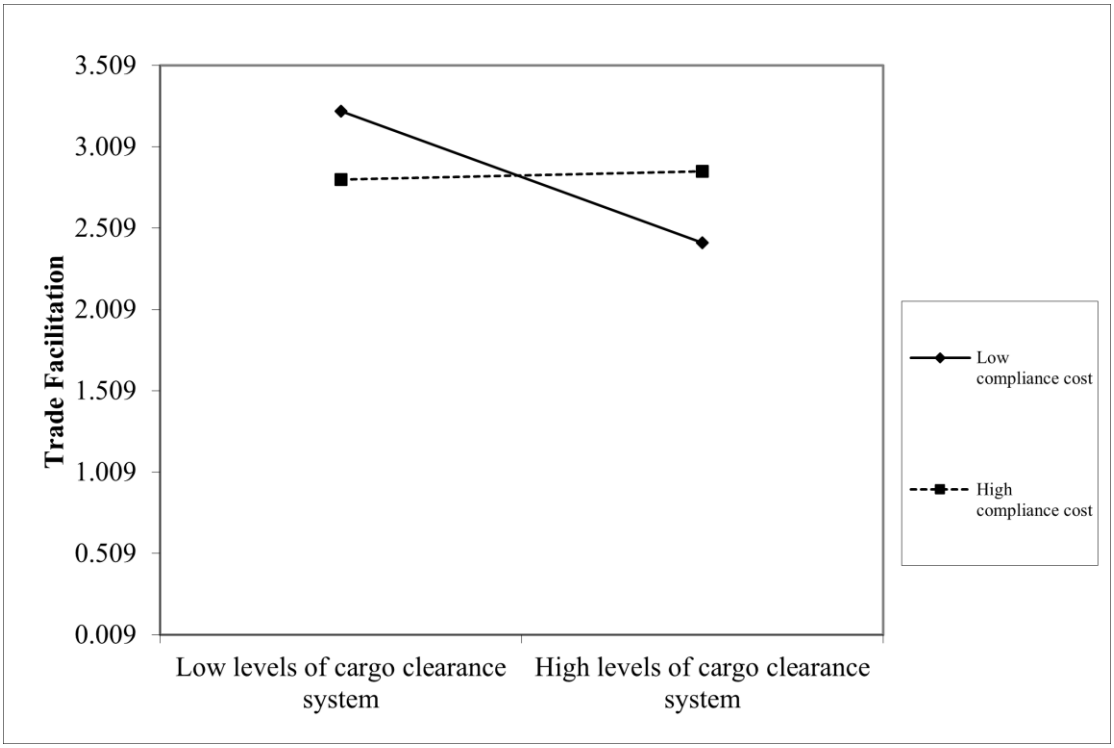

Figure 4.2: MODI Graph Cargo Clearance System and Compliance Costs

Source Author: 2024

As shown on figure 4.2 while the cargo clearance system at the Busia border has the potential to significantly enhance trade facilitation, the associated compliance costs must be carefully managed to ensure that these benefits are fully realized. Reducing compliance costs could amplify the positive effects of the cargo clearance system, thereby promoting more efficient and cost-effective trade processes.

Interaction Between Duty Computation System and Compliance Costs

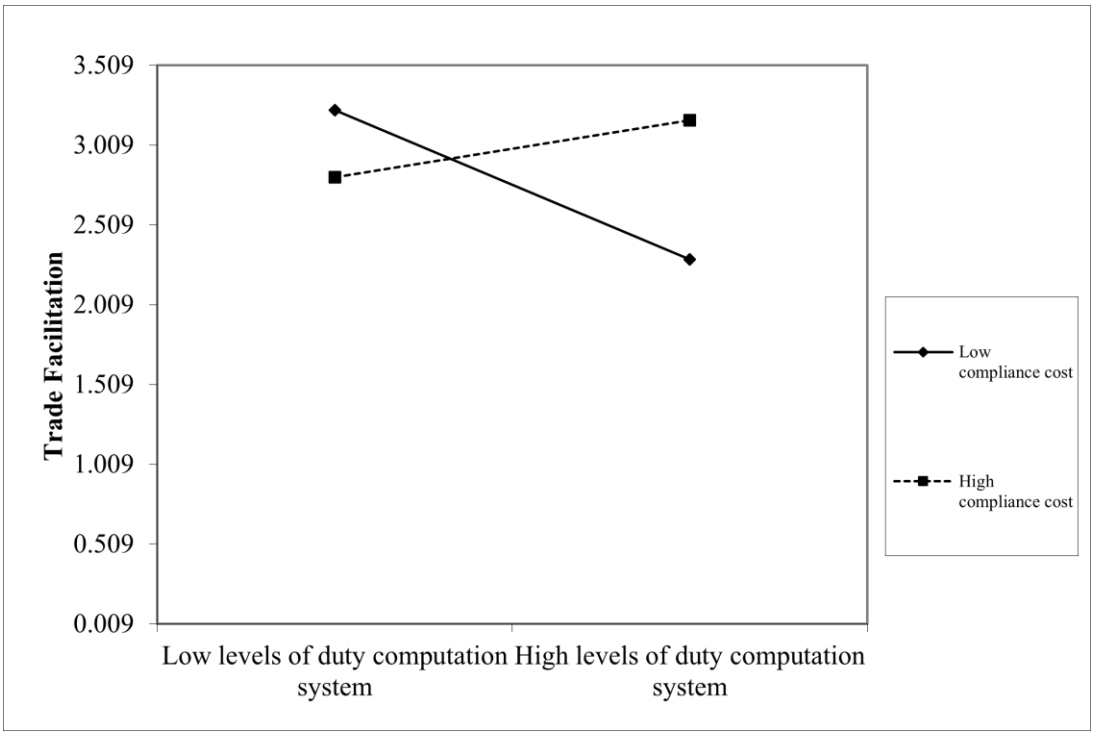

Figure 4.3: MODI Graph Duty Computation System and Compliance Costs

Source Author: 2024

Figure 4.3 showed that when compliance costs are low, the duty computation system tends to have a more positive impact on trade facilitation. This is because lower compliance costs reduce the burden on traders, allowing them to benefit more from the efficiencies introduced by the duty computation system.

Interaction Between Customs Monitoring System and Compliance Costs

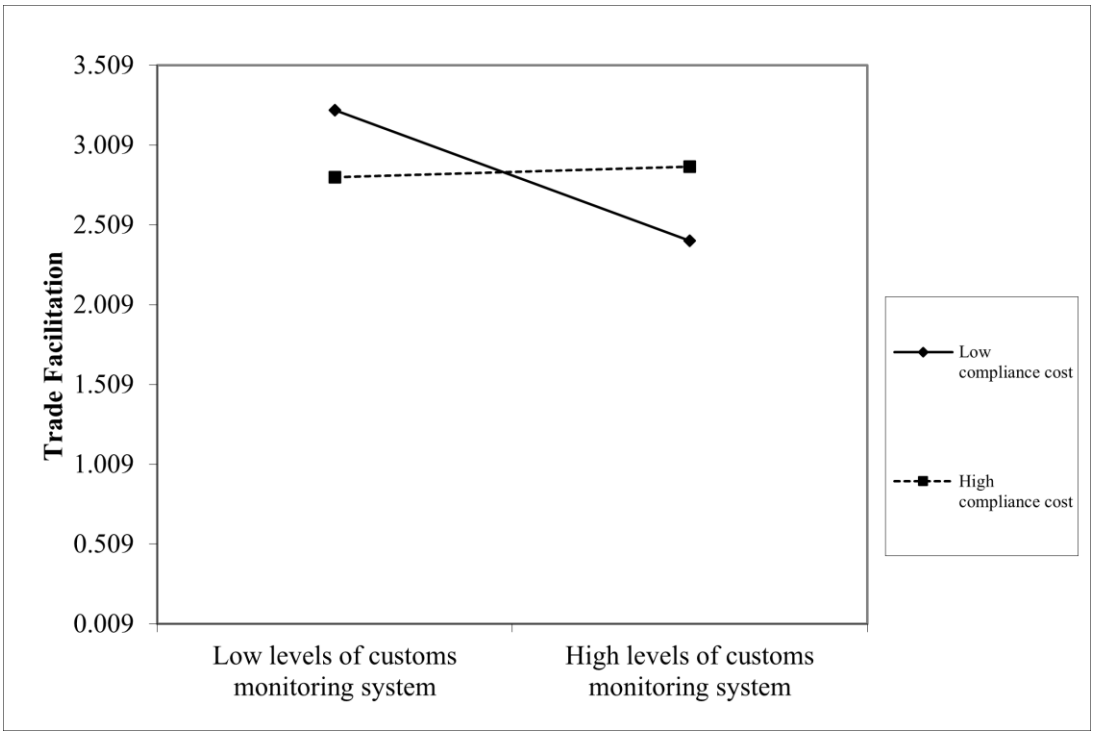

Figure 4.4: MODI Graph Customs Monitoring System and Compliance Costs

Source Author: 2024

Figure 4.4 showed that when compliance costs are low, the positive effects of an efficient customs monitoring system on trade facilitation are enhanced. This is because lower compliance costs reduce the financial burden on traders, allowing them to benefit more from streamlined and efficient customs processes.

4.13 Discussion of Findings

4.13.1 Cargo Clearance System and Trade Facilitation

The first objective was to determine the effect of cargo clearance system on trade facilitation in Busia border, Kenya. The study through the coefficient analysis found that cargo clearance system has a positive and significant effect on trade facilitation. $\beta = 0.179$, $p=0.008<0.05$. The study concludes that improvements in the cargo clearance

system are positively and significantly associated with better trade facilitation, with a notable strength of correlation and a quantifiable positive impact on trade processes.

The study aligns with the findings of Luther (2021), who investigated the cargo clearance system and revenue collection at Durban Container Terminal. Luther used a survey research design involving operators and customs officers. His findings indicated that the cargo clearance system improved auditability, though it led to increased transfer costs due to the need to move containers to and from the clearance area. He suggested that installing additional clearance machines and equipment could address these issues. Similarly, this study agrees with Cirincione et al. (2018), who explored the impact of cargo scanners on customs operations. Their descriptive research highlighted challenges in achieving 100% maritime cargo container scanning. They discovered that while the costs of scanning were manageable, adding physical inspections significantly raised overall costs, thus creating a barrier to full implementation.

4.13.2 Duty Computation System and Trade Facilitation

The second objective was to determine the effect of duty computation system on trade facilitation in Busia border, Kenya. The study through the coefficient analysis found that duty computation system has a positive and significant effect on trade facilitation. $\beta = 0.137$, $p=0.034<0.05$. The study concludes that improvements in the duty computation system are positively and significantly associated with better trade facilitation, with a notable strength of correlation and a quantifiable positive impact on trade processes.

The study aligns with the observations of Azmi and Kamarulzaman (2020), who found that despite Malaysia's swift adoption of computerized duty systems, the reliability of these systems remains compromised due to the public's high perception of risk. This reflects a broader trend observed by Nisar (2013) in developing countries, where tax

authorities continue to face substantial challenges in tax compliance despite the implementation of computerized systems. Additionally, the findings resonate with Kariuki's (2019) research, which emphasized the critical role of ICT in revenue administration. Kariuki noted that ICT enhances revenue management by providing accessible historical and current data, reducing computation errors, cutting down data processing times, and lowering overall costs.

4.13.3 Customs Monitoring System and Trade Facilitation

The third objective was to determine the effect of customs monitoring system on trade facilitation in Busia border, Kenya. The study through the coefficient analysis found that customs monitoring system has a positive and significant effect on trade facilitation. $\beta = 0.176$, $p=0.008<0.05$. This reinforces the conclusion that enhancements in the customs monitoring system are likely to have a meaningful and positive impact on trade facilitation.

The study concurred with a study according to ESCAP (2013), China and Viet Nam installed satellite positioning systems device on vehicles transporting dangerous goods and passengers and made it a mandatory measure. Monitoring and securing the movement of containers in China, the Republic of Korea and Thailand is done using electronic seals. The study also aligns with Bujak (2019), who asserts that the systems in question may encompass various components such as screening, electronic monitoring, border crossing weigh-in motion, automatic equipment identification, and credentials supervision. In addition, Mahlknecht and Madani (2007) highlight the significance of the Electronic Cargo Tracking System (ECTS) in ensuring the security and safety of all members in the end supply chain.

4.13.4 Moderating Effect of Compliance Cost and Relationship Between Integrated Customs Management System and Trade Facilitation

The fourth objective of study was to establish the moderating effect of compliance cost on relationship between cargo clearance system, duty computation system, customs monitoring system on trade facilitation at Busia border, Kenya. The study found that compliance cost negatively affects trade facilitation $\beta = -0.618$, $p=0.000<0.05$. The study finds that higher compliance costs are strongly associated with poorer trade facilitation, and this negative impact is both substantial and statistically significant. The study concurred with Djankov et al. (2019) who found that reducing trade costs by improving trade facilitation can lead to significant increases in trade flows and economic welfare. The study emphasized the importance of streamlining customs procedures and reducing bureaucratic hurdles to lower trade costs effectively.

The study also found that compliance cost significantly moderates the effects of cargo clearance system on trade facilitation $\beta = -0.006$, $p=0.000<0.05$. Suggests that higher compliance costs weaken the positive effect of the cargo clearance system on trade facilitation. The study further found that compliance cost moderates the effects of duty computation system on trade facilitation $\beta = -0.081$, $p=0.004<0.05$. Suggests that higher compliance costs weaken the positive effect of the duty computation system on trade facilitation.

Lastly the study further found that compliance cost moderates the effects of customs monitoring system on trade facilitation $\beta = -0.005$, $p=0.000<0.05$. This implies that higher compliance costs weaken the positive effect of the customs monitoring system on trade facilitation. The study agreed that (Beyene, 2022) complicated tax systems make it difficult and expensive for some taxpayers to comply with policies and

procedures owing to the costs associated with record keeping and the need for specialized information to comply with complex tax laws.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section provides a summary of the investigative findings, draws conclusions related to the research objectives, and offers recommendations. Additionally, it presents suggestions for future research.

5.2 Summary of Findings

5.2.1 Cargo Clearance System and Trade Facilitation

The study aimed to determine the effect of the cargo clearance system on trade facilitation at the Busia border, Kenya. It was found that there is a positive and significant correlation between the cargo clearance system and trade facilitation. Improvements in the cargo clearance system are associated with better trade facilitation, indicating a strong relationship and a measurable positive impact on trade processes. The study also through the coefficient analysis found that cargo clearance system has a positive and significant effect on trade facilitation. $\beta = 0.179$, $p=0.008<0.05$.

5.2.2 Duty Computation System and Trade Facilitation

The second objective was to assess the effect of the duty computation system on trade facilitation. The study revealed a positive and significant correlation between the duty computation system and trade facilitation. Enhancements in the duty computation system are linked to improvements in trade facilitation, demonstrating a substantial relationship and a quantifiable positive impact on trade processes. The study also through the coefficient analysis found that duty computation system has a positive and significant effect on trade facilitation. $\beta = 0.137$, $p=0.034<0.05$.

5.2.3 Customs Monitoring System and Trade Facilitation

The third objective focused on the effect of the customs monitoring system on trade facilitation. The findings indicated a positive and significant correlation between the customs monitoring system and trade facilitation. Better implementation of customs monitoring systems is associated with enhanced trade facilitation, highlighting a strong relationship and a notable positive impact on trade processes. The study also through the coefficient analysis found that customs monitoring system has a positive and significant effect on trade facilitation. $\beta = 0.176$, $p=0.008<0.05$.

5.2.4 Compliance Cost and Trade Facilitation

The final objective was to examine the moderating effect of compliance costs on the relationship between the cargo clearance system, duty computation system, customs monitoring system, and trade facilitation. The study found that compliance costs have a negative and significant correlation with trade facilitation. Higher compliance costs are strongly associated with poorer trade facilitation. Furthermore, compliance costs were found to weaken the positive effects of the cargo clearance system, duty computation system, and customs monitoring system on trade facilitation, indicating that reducing compliance costs could enhance the positive impacts of these systems on trade processes.

The study also found that compliance cost significantly moderates the effects of cargo clearance system on trade facilitation $\beta = -0.006$, $p=0.000<0.05$. The study further found that compliance cost moderates the effects of duty computation system on trade facilitation $\beta = -0.081$, $p=0.004<0.05$. Lastly the study further found that compliance cost moderates the effects of customs monitoring system on trade facilitation $\beta = -0.005$, $p=0.000<0.05$.

5.3 Conclusion

The study’s main objective was to establish the moderating effect of compliance cost on relationship between integrated customs management system and trade facilitation at Busia border in Kenya.

The study's findings conclusively demonstrate that the cargo clearance system at the Busia border has a positive and significant impact on trade facilitation. The study found a positive and significant impact of the cargo clearance system on trade facilitation, which is consistent with the findings of Erceg (2019) and Kwalia (2020). Erceg observed that e-customs, including the NCTS, reduced transit and waiting times, supporting smoother cross-border trade in Croatia. Similarly, Kwalia highlighted the role of electronic customs in Nairobi, which improved clearance times and reduced associated costs. These findings reinforce the study's conclusion that optimizing cargo clearance can enhance trade facilitation. However, Luther (2021) introduced a nuanced view, indicating increased transfer costs due to container movements, suggesting that while clearance efficiency is important, cost considerations in clearance operations should not be overlooked. Specifically, improvements in the cargo clearance system are strongly associated with enhanced trade facilitation. This suggests that optimizing cargo clearance processes can substantially improve the efficiency and effectiveness of trade activities. Therefore, stakeholders should prioritize enhancing the cargo clearance system to leverage its positive effects on trade facilitation.

The research highlights that the duty computation system plays a crucial role in facilitating trade at the Busia border. This indicates that refining the duty computation system can lead to substantial improvements in trade facilitation. The study’s finding that the duty computation system is pivotal in facilitating trade aligns with prior literature on the impact of computerized systems. For example, Azmi and

Kamarulzaman (2020) noted that computerized duty systems in Malaysia faced adoption barriers due to trust and risk perceptions. This reinforces the current study's recommendation to optimize duty computation, suggesting that alongside system efficiency, managing user trust and addressing perceived risks may be crucial. Ondogo's (2020) insights on the Single Customs Territory further support this conclusion, as it underscored the need for efficient duty computation systems in East Africa to streamline cross-border trade. To maximize the benefits of trade facilitation, it is recommended that efforts focus on optimizing duty computation processes to ensure a more efficient trade environment.

The study revealed that the customs monitoring system has a significant and positive effect on trade facilitation. This underscores the importance of effective customs monitoring in enhancing trade facilitation. Enhanced customs monitoring systems contributes to more streamlined and efficient trade processes. Consequently, investing in and upgrading customs monitoring systems is essential for achieving significant improvements in trade facilitation at the Busia border. This result is supported by findings from Vatuiu and Tarca (2021), who reported that e-customs systems in Romania improved customs oversight and reduced fraud. Freeman (2017) and ESCAP (2013) also highlighted the positive impact of real-time cargo monitoring and e-seals on efficient transit management. These studies support the study's emphasis on investing in and upgrading customs monitoring systems to improve efficiency. However, Kabiru (2020) pointed out challenges such as high costs and inadequate infrastructure, which the study does not address directly. Addressing these barriers could further strengthen the effectiveness of customs monitoring systems.

The findings concerning compliance costs reveal a negative and significant correlation with trade facilitation. This indicated that increasing compliance costs adversely affects

trade facilitation. Moreover, compliance costs were found to moderate and weaken the positive impacts of the cargo clearance system, duty computation system, and customs monitoring system on trade facilitation. The conclusion was consistent with, consistent with Djankov et al. (2019), who emphasized the need to lower trade costs to enhance economic welfare. Similar to Stanford (2019) and Tran-Nam et al. (2020), the study suggests that high compliance costs undermine the benefits of customs systems. Furthermore, Beyene (2022) and Bird & Wallace (2022) described complex tax systems as barriers to compliance, particularly for small businesses in developing economies, an insight that the study supports in its call for policymakers to reduce compliance costs to optimize trade facilitation mechanisms. Therefore, it is crucial for policymakers and trade stakeholders to address and reduce compliance costs to mitigate their negative effects and enhance the overall effectiveness of trade facilitation mechanisms. Reducing compliance costs can help optimize the benefits of cargo clearance, duty computation, and customs monitoring systems, ultimately improving trade facilitation outcomes.

This study provides a significant contribution to knowledge by offering empirical insights into the relationship between customs systems and trade facilitation at a key border point in Kenya, specifically the Busia border. The study contributes to the understanding of how improvements in cargo clearance, duty computation, and customs monitoring systems can positively affect trade facilitation. Through statistical analysis, the research demonstrates that each of these systems has a measurable, positive, and significant effect on trade facilitation, as shown by positive beta coefficients and p-values below the 0.05 significance level. By establishing these relationships quantitatively, the study fills a gap in literature regarding the role of specific customs processes in trade efficiency, particularly in the East African context, where empirical

data on this topic is limited. Furthermore, the study adds to the field by exploring compliance costs as a moderating factor, revealing that high compliance costs negatively impact trade facilitation and diminish the positive effects of the other systems on trade. This insight into compliance costs underscores the need for policymakers to consider not only system improvements but also strategies to lower compliance costs to optimize trade facilitation fully. The findings of this study provide a foundation for further research on trade facilitation in developing regions and inform policy recommendations aimed at enhancing cross-border trade efficiency through targeted customs reforms.

5.4 Recommendations

5.4.1 Policy Implications for Government

The study's findings offer important implications for policymakers aiming to enhance trade facilitation at key border points like Busia. The positive impact of the cargo clearance, duty computation, and customs monitoring systems on trade facilitation suggests that the government should prioritize investment in these systems to further streamline cross-border trade. Strengthening these systems could be achieved through policies promoting technological upgrades, integration, and training initiatives. Given the negative moderating effect of compliance costs on trade facilitation, the government should consider policy interventions to reduce these costs, such as simplifying regulatory requirements and reducing paperwork. Lowering compliance costs will allow customs systems to operate more effectively, maximizing the positive impacts on trade facilitation and encouraging more efficient regional trade.

5.4.2 Practical Implications

The study's findings indicated practical strategies for key stakeholders, including customs management, the Kenya Revenue Authority (KRA), and taxpayers.

Management at customs should continue enhancing the cargo clearance, duty computation, and customs monitoring systems, as improvements in these areas have a direct and positive effect on trade facilitation. For KRA, a focus on simplifying duty computation processes and improving digital systems for cargo and customs monitoring could assist to facilitate smoother, faster trade processes. Moreover, the KRA could benefit from implementing training programs to increase familiarity with digital systems and automation, thus reducing processing time. Taxpayers, especially importers and exporters, should advocate for and utilize efficient digital tools that streamline the compliance process and minimize costs, aligning with the study's findings that lower compliance costs can improve trade outcomes.

5.4.3 Theoretical Implications

The study's findings align closely with the propositions of System Theory and Transaction Cost Theory. System Theory, which emphasizes the interconnectedness and optimization of systems to achieve efficiency, is supported by the study's results showing that integrated and efficient cargo clearance, duty computation, and customs monitoring systems enhance trade facilitation. Additionally, Transaction Cost Theory, which highlights the importance of minimizing transaction-related costs to improve trade outcomes, is directly relevant to the study's findings regarding the negative moderating effect of compliance costs. The observation that high compliance costs diminish the positive impact of customs systems on trade facilitation is consistent with Transaction Cost Theory's emphasis on cost reduction. While Technological Change Theory underlines the role of technology in driving improvements, the most robust theoretical alignment of the study's main findings is with Transaction Cost Theory, as it specifically explains the moderating effect of compliance costs on trade facilitation at the Busia border.

5.5 Suggestions for Future research

A future study should be conducted on the effects of perceived benefit on trade facilitation.

By examining the impact of regulatory complexity on trade outcomes, researchers can provide insights into how various levels of administrative requirements influence clearance times, costs, and trade flows. This research could be particularly valuable in determining the most impactful regulatory reforms for facilitating trade at busy borders. Future research could focus on how customs workforce capacity impact trade facilitation. Customs personnel play a central role in managing border processes, and their knowledge, training, and capacity to handle high volumes of cargo can directly influence trade facilitation.

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APPENDICES

Appendix I: Introduction Letter

20th February 2024,

Stanley Kamau

P.O. Box 5218-00100

Nairobi.

Dear Sir/Madam,

RE: DATA COLLECTION

I am a student pursuing Masters in Tax and Customs Administration at Moi University which is conducting a joint Master's Programme with Kenya School of Revenue Administration. I am carrying out a research study on. **MODERATING EFFECT OF COMPLIANCE COST ON RELATIONSHIP BETWEEN INTEGRATED CUSTOMS MANAGEMENT SYSTEM AND TRADE FACILITATION AT BUSIA BORDER IN KENYA.** You have been selected as a participant in this study and your co-operation will be highly appreciated. Attached herein is a documentary guide, you are requested to give your honest opinion about the research study. The information will be used for the purpose of this research only and shall be accorded all the confidentiality.

Thank you.

Appendix II: Questionnaire

This questionnaire is designed to collect information on **MODERATING EFFECT OF COMPLIANCE COST ON RELATIONSHIP BETWEEN INTEGRATED CUSTOMS MANAGEMENT SYSTEM ON TRADE FACILITATION AT BUSIA BORDER IN KENYA** Kindly answer the following questions honestly and accurately as possible. The information given will be treated with a lot of confidentiality. Please do not write your name anywhere on this questionnaire.

Section A: Demographic Information

1. Gender

Female [ ]

Male [ ]

2. Indicate where you fall among the following age brackets (years)

Below 25 [ ]

26-35 [ ]

36-45 [ ]

46-55 [ ]

Above 55 [ ]

3. Level of education

Primary [ ]

Secondary Certificate [ ]

Diploma level [ ]

Degree level [ ]

Others [ ]

CARGO CLEARANCE SYSTEM

Using the following scale, state your opinion by ticking on the space

On a scale of 1-5 where 1=strongly disagree, 2= disagree, 3= Neutral, 4= agree and 5=strongly agree

	5	**4**	**3**	**2**	**1**
Cargo clearance system is a complex system that is not easy to use					
Cargo clearance system gives accurate reports					
The system is reliable and allows for consistent reporting of data without significant glitches					
Cargo clearance system is time consuming					
We have specific Customs documentation procedures and regulations for cargo					
The queues for clearance have reduced					

DUTY COMPUTATION SYSTEM

Using the following scale, state your opinion by ticking on the space

On a scale of 1-5 where 1=strongly disagree, 2= disagree, 3= Neutral, 4= agree and 5=strongly agree

	5	**4**	**3**	**2**	**1**
We can make more clearances on products due to use of duty computation system resulting to more taxes to the KRA					
The owners of the goods can pay their duties at the comfort of their homes/offices electronically					
Confirmation of duties paid is confirmed instantly due to the use of duty computation system					

CUSTOMS MONITORING SYSTEM

Using the following scale, state your opinion by ticking on the space

On a scale of 1-5 where 1=strongly disagree, 2= disagree, 3= Neutral, 4= agree and 5=strongly agree

	5	**4**	**3**	**2**	**1**
Use of customs monitoring system leads to a more efficient and individual container traceability					
Customs monitoring system allows real time monitoring of the status of product and goods movements					
Real time remote containers tracking and monitoring help to prevent losing track of container and goods					
Use of customs monitoring system has led to reduction in deterioration theft, diversion and counterfeiting					
The tampered carrier can be inspected away from the destination port to prevent potential negative impact and potential destruction (when high jacked by terrorists					

TRADE FACILITATION

Using the following scale, state your opinion by ticking on the space

On a scale of 1-5 where 1=strongly disagree, 2= disagree, 3= Neutral, 4= agree and 5=strongly agree

	5	**4**	**3**	**2**	**1**
Volumes of cargo traded across the border have increased					
KRA has offered an enabling environment for tax filing					
Companies file returns on time and as required by law					
Lodging and processing of Customs declaration have been made easier and transparent					
Lodgment and processing of the Imports declaration form has improved significantly.					
Time taken to declare goods to Customs has reduced significantly					

MODERATOR

COMPLIANCE COST

Using the following scale, state your opinion by ticking on the space

On a scale of 1-5 where 1=strongly disagree, 2= disagree, 3= Neutral, 4= agree and 5=strongly agree

	5	**4**	**3**	**2**	**1**
I incur demurrage charges					
There is Time lost in tax calculations					
Actual tax payable affects trade facilitation					
I incur Cost of hiring professionals					
Hiring staff to do tax calculations and record keeping is costly					

Appendix III: KESRA Letter

KENYA REVENUE AUTHORITY

ISO 9001:2015 CERTIFIED

PUBLIC

KENYA SCHOOL OF REVENUE ADMINISTRATION

REF: KESRA/NBI/036

29th July 2024

TO: WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: REQUEST FOR ASSISTANCE TO STANLEY KAMAU NDABARU OF REGISTRATION NO.: KESRA105/0029/2023 UNDERTAKING MASTERS AT KESRA

This is to confirm that the above named is a student at Kenya School of Revenue Administration (KESRA) Nairobi Campus pursuing Masters in Tax and Customs Administration.

The named student is undertaking Research on TOPIC: **"Moderating effect of compliance cost on relationship between integrated customs management system and trade facilitation at Busia border in Kenya."**

The purpose of this letter is to request for your kind facilitation in enabling the student progress in his research project by allowing access to any relevant information and/or conduct interviews, which are relevant to the project.

Your support to the student in this regard will be highly appreciated.

Thank you.

SCHOOL OF REVENUE ADMINISTRATION
DEAN OF STUDIES
29 JUL 2024
ACADEMIC AFFAIRS DIVISION

Damacrine Masira
Manager Academic Research,
KESRA

Tulipe Ushuru, Tujitegemee!

Appendix IV: NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **834206**

Date of Issue: **12/August/2024**

RESEARCH LICENSE

This is to Certify that Mr.. STANLEY KAMAU of Kenya School of Revenue Administration, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Busia on the topic: MODERATING EFFECT OF COMPLIANCE COST ON RELATIONSHIP BETWEEN INTEGRATED CUSTOMS MANAGEMENT SYSTEM AND TRADE FACILITATION AT BUSIA BORDER IN KENYA. for the period ending : 12/August/2025.

License No: **NACOSTI/P/24/38737**

834206

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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

See overleaf for conditions

Appendix V: Plagiarism Awareness Certificate

SR685

ISO 9001:2019 Certified Institution

THESIS WRITING COURSE

PLAGIARISM AWARENESS CERTIFICATE

This certificate is awarded to

STANLEY KAMAU

KESRA 105/0029/2022

In recognition for passing the University's plagiarism

Awareness test for Thesis **entitled: MODERATING EFFECT OF COMPLIANCE COST ON RELATIONSHIP BETWEEN INTEGRATED CUSTOMS MANAGEMENT SYSTEM AND TRADE FACILITATION AT BUSIA BORDER IN KENYA** similarity index of 9% and striving to maintain academic integrity.

Word count:21082

Awarded by

Prof. Anne Syomwene Kisilu
CERM-ESA Project Leader Date: 17/09//2024