EAST AFRICAN CUSTOMS UNION AND ECONOMIC GROWTH IN UGANDA

BY

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DECLARATION

I, Amongin Anita Emuron, affirm that this work is original and has not been submitted for any other degree award to any other University before.

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APPROVAL

This research report has been submitted for examination with the approval of the following University Supervisor;

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DEDICATION

This research report is sincerely dedicated to my parents, whose love, guidance, and unwavering support have given my life profound meaning and purpose.

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I wish to express my heartfelt gratitude to the Almighty God for the gift of life, wisdom, and unwavering support throughout this journey. His guidance has been my constant source of strength, enabling me to overcome challenges and remain steadfast in pursuing my goals.

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LIST OF ABBREVIATIONS

BOU	Bank of Uganda
CGE	Computable General Equilibrium
EABC	East African Business Council
EAC	East African Community
EACCU	East Africa Community Customs Union
EPRC	Economic Policy Research Centre
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
NTBs	Non-Tariff Barriers
TFP	Total Factor Productivity
UNECA	United Nations Economic Commission for Africa

ABSTRACT

This study empirically investigates the effect of the East African Community (EAC) Customs Union on Uganda's economic growth, guided by the Gravity Model of Trade and the Solow Growth Model. Using annual time-series data from 1994 to 2024, the analysis employed a two-stage approach. First, a Vector Error Correction Model (VECM) was used to examine the long-run and short-run effect of the Customs Union on Uganda's trade performance. Second, a separate VECM estimated the relationship between intra-EAC trade and Uganda's economic growth. Key variables included logged trade volume, real GDP figures for Uganda and its partners, and a dummy variable for the post-2005 Customs Union period. The models were validated through Johansen cointegration tests, which confirmed stable long-run relationships, and robust diagnostic checks for serial correlation, heteroskedasticity, and normality.

The findings reveal a critical paradox: while intra-EAC trade has a positive and statistically significant long-run effect on Uganda's economic growth, the EAC Customs Union policy itself shows no significant independent impact on driving that trade. This indicates that Uganda's trade growth is more attributable to the general economic expansion of the region than to the tariff liberalization of the Customs Union, with structural constraints like a narrow export base and persistent non-tariff barriers muting the policy's effect. Consequently, the study concludes that the benefits of regional integration are not automatic. It recommends that Ugandan policymakers move beyond tariff liberalization to urgently implement targeted measures including the elimination of non-tariff barriers, investment in trade infrastructure, and support for export diversification to fully harness the growth potential of intra-EAC trade.

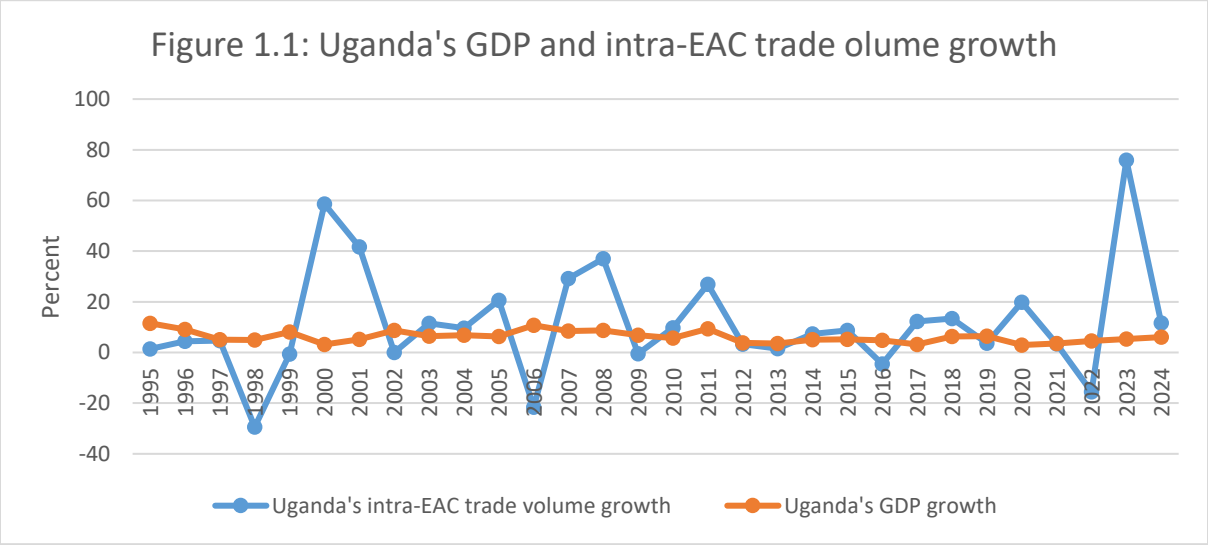
CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Regional integration has long been viewed as a pathway for enhancing trade, investment, and economic growth, particularly in developing countries (Shengnan, 2022). Uganda's economic journey provides a critical context for this, as its recovery from the instability of the 1970s and 80s was marked by structural adjustment and liberalization reforms in the 1990s (Reinikka & Svensson, 2001). This era of liberalization culminated in the launch of the East African Community (EAC) Customs Union in 2005, the first stage of a deeper integration framework designed to remove internal tariffs, establish a common external tariff, and harmonize trade policies among partner states (EAC, 2005). Theoretically, such unions are expected to generate welfare gains through trade creation and economies of scale, though they also carry risks of trade diversion (Viner, 1950; Balassa, 1961). For a landlocked nation like Uganda, this promised enhanced market access, reduced transaction costs, and a stronger position in regional value chains (Collier, 2007; UNECA, 2017).

In the years following the Customs Union's inception, Uganda's economy experienced notable growth, often exceeding 6 percent in the mid-2000s, partly coinciding with these regional integration efforts (World Bank, 2019).



Source: World Development Indicators (2025)

Empirical evidence from this period confirms a significant expansion in intra-EAC trade flows (Musila & Sigué, 2016). However, other studies revealed that while Uganda benefited from cheaper imports of intermediate and capital goods, its export base remained narrow and dominated by primary commodities such as coffee and tea, leading to a persistent trade deficit with more industrialized partners like Kenya (Shinyekwa and Mawejje, 2013; Silas, 2015). Furthermore, the anticipated growth benefits were constrained by persistent non-tariff barriers, infrastructural bottlenecks, and political and logistical disruptions at border points, which continued to undermine competitiveness despite the formal tariff-free regime (UNECA, 2017).

Thus, while the EAC Customs Union represented a significant milestone in Uganda's trade policy, its contribution to sustained and transformative economic growth remains an open empirical question. The country's economic performance has been volatile, reflecting vulnerabilities to external shocks and structural challenges (African Development Bank, 2022), highlighting the critical need to move beyond observing trade volumes to rigorously determine the Customs Union's net causal effect on Uganda's long-term economic growth trajectory.

1.2 Problem statement

The establishment of the East African Community (EAC) Customs Union in 2005 was a pivotal moment for regional integration, founded on the promise of fostering stable and sustained economic growth for member states like Uganda through enhanced market access, trade creation, and investment inflows (EAC, 2005). However, this promise appears unfulfilled when scrutinized against Uganda's actual economic trajectory. As illustrated in Figure 1.1, Uganda's GDP growth has been characterized by profound volatility over the past three decades, with sharp peaks and troughs persisting both before and, crucially, after the implementation of the Customs Union.

Figure 1.1 reveals a critical anomaly: while Uganda's intra-EAC trade volume growth has shown its own volatility, there is no clear, stable correlation with GDP growth following 2005. For instance, periods of high trade growth do not consistently translate into sustained GDP growth, and significant GDP contractions occur despite positive trade growth. This disconnect highlights a fundamental problem. The theoretical benefits of the Customs Union have been potentially undermined by Uganda's persistent structural constraints including its dependence on primary commodity exports, infrastructural bottlenecks, and the prevalence of non-tariff barriers within the

EAC (Mugano, 2015; World Bank, 2023). Consequently, a critical gap exists in understanding the pathway from Customs Union membership to tangible economic growth in Uganda. This study therefore empirically investigated this relationship to determine whether the Customs Union has acted as a genuine catalyst for stable economic expansion or merely a framework within which Uganda's pre-existing vulnerabilities continue to dictate volatile outcomes.

1.3 Objectives of the Study

The main objective of the study was to investigate the effect of the East African Community (EAC) Customs Union on Uganda's economic growth. Specifically, the study;

1. Examined the effect of the East African Community Customs Union on Uganda's trade performance with its regional partners.
2. Determined the effect of intra-EAC trade on Uganda's economic growth.

1.4 Hypotheses

This study was guided by the following hypotheses;

1. The East African Community Customs Union has no significant effect on Uganda's trade performance.
2. Intra-EAC trade has no significant effect on economic growth in Uganda.

1.5 Scope of the study

This research is rigorously focused on assessing the impact of the EAC Customs Union exclusively within the context of Uganda. The analysis covers the period from 1994 to 2024, a timeframe strategically selected to provide a robust comparative basis. It encapsulates eleven years of the pre-Customs Union era (1994-2004) and nineteen years of its operationalization (2005-2024), allowing for a clear examination of structural breaks and long-term trends.

The study's scope is delineated by two primary analytical foci: first, the direct effect of the Customs Union on Uganda's trade volumes with EAC member states; and second, the subsequent transmission mechanism from this intra-regional trade to Uganda's Gross Domestic Product (GDP) growth. The analysis relies exclusively on Ugandan national data from sources such as the Uganda Bureau of Statistics (UBOS) and the World Bank to ensure all findings are directly pertinent to

Ugandan economic policy and outcomes. While the GDP of partner states is considered as an explanatory variable in modelling trade flows, the unit of analysis and the ultimate subject of all conclusions remains Uganda.

1.6 Significance of the study

From a policy perspective, this study provided evidence-based insights into whether Uganda has realized meaningful growth benefits from its participation in the East African Community (EAC) Customs Union since 2005. Such findings are crucial for guiding government strategies on regional integration, trade negotiations, and the implementation of Uganda's Vision 2040, which emphasizes harnessing regional markets for economic transformation. Academically, the study contributes to the body of literature on regional integration and economic growth by offering an empirical analysis specific to Uganda, thereby filling gaps where most existing studies have focused on the EAC as a bloc or on larger economies within the region. Furthermore, the findings may benefit stakeholders such as policymakers, trade practitioners, private sector actors, and development partners by clarifying the opportunities and constraints Uganda faces under the Customs Union. Ultimately, the study's significance lies in its potential to inform strategies for strengthening Uganda's competitiveness, diversifying exports, and ensuring inclusive and sustainable growth within the EAC framework.

1.7 Organization of the research paper

This research report is structured as follows: Chapter Two provides a comprehensive literature review, followed by Chapter Three, which outlines the study methodology. In Chapter Four, the findings of the study are presented, and finally, Chapter Five concludes with remarks and policy recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section presents a review of both theoretical and empirical literature on economic unions and their impact on economic growth, with attention to experiences from both developed and developing countries. By examining these perspectives, the discussion provides a contextual foundation for the subsequent analysis. The insights gained informed the specification of the analytical model and guide the selection of relevant variables for the empirical estimation.

2.2 Theoretical review

This study is anchored in two complementary theoretical frameworks: the Gravity Model of Trade, which predicts the trade effects of regional integration, and the Solow Growth Model, which explains how these trade effects translate into economic growth. The integration of these models provides a holistic lens to analyze the impact of the EAC Customs Union on Uganda.

2.2.1 The gravity model of trade and regional integration

The Gravity Model of trade offers a robust theoretical foundation for anticipating the initial impact of the EAC Customs Union. Analogous to Newton's law of universal gravitation, the model posits that the volume of trade between two countries is a function of their economic size and the distance between them (Tinbergen, 1962). The basic model is expressed as:

$$T_{ij} = A\frac{Y_i^{\alpha}.Y_j^{\beta}}{D_{ij}^{\theta}}$$

Where:

- T_{ij} is the trade flow from country i (Uganda) to country j (an EAC partner).
- Y_i and Y_j are the national incomes (GDPs) of the two countries, representing economic mass.
- D_{ij} is the geographical distance, a proxy for transport costs.
- A is a constant term.
- α, β, θ are parameters to be estimated.

The establishment of a Customs Union directly impacts this equation by introducing a policy variable that reduces "trade costs." Anderson & van Wincoop (2003) advanced the model by incorporating multilateral resistance terms, emphasizing that trade depends on relative trade costs. The model can be extended to include a variable for trade agreements:

$$T_{ij} = A\frac{\left(Y_i^{\alpha}.Y_j^{\beta}\right)}{D_{ij}^{\theta}.(C_{ij}^{\delta})}$$

Here, C_{ij} represents all trade cost factors, including tariffs. The EAC Customs Union, by eliminating tariff barriers and streamlining procedures, acts as a negative shock to C_{ij}. As δ is typically positive, a decrease in C_{ij} leads to a direct increase in predicted trade flows (T_{ij}). For Uganda, a landlocked economy, this theoretical reduction in trade costs with larger partners like Kenya and Tanzania is critical. It predicts enhanced market access, which is the primary channel through which the Customs Union is expected to stimulate initial economic activity.

2.2.2 The Solow Growth Model: from trade to long-run growth

While the Gravity Model explains the trade creation effect, the Solow Growth Model (Solow, 1956) provides the framework for understanding how this trade translates into long-term economic growth. The model starts with a production function:

$$Y = A.F(K, L)$$

Where Y is output, K is capital, L is labor, and A represents Total Factor Productivity (TFP). Assuming a Cobb-Douglas form, this becomes:

$$Y = A.K^{\alpha}L^{1-\alpha}$$

The model's core is the capital accumulation equation:

$$\dot{k} - s.f(k) - (n + \delta)k$$

Where $\dot{k}$ is the change in capital per effective worker, s is the savings rate, $f(k)$ is output per effective worker, n is the population growth rate, and δ is the depreciation rate.

The Customs Union can influence Uganda's growth path through this model in two key ways:

Capital Accumulation (s): Increased export revenues and foreign direct investment (FDI) attracted by the larger regional market can boost the domestic savings and investment rate (s), leading to a higher steady-state level of capital per worker (k^*) and thus a higher level of output.

Productivity (A): By facilitating the import of advanced machinery, technology, and higher-quality intermediate inputs from partner states, the Customs Union can directly enhance Total Factor Productivity (A).

However, a key limitation of the basic Solow model is its treatment of technology (A) as exogenous. This implies that the benefits of integration are automatic and that Uganda would passively converge to the technological level of its more advanced partners, which is often not the case in reality.

The limitation of the exogenous Solow model highlights the necessity of incorporating insights from Endogenous Growth Theory (Romer, 1990). This theory posits that technological progress is driven by intentional investments within the economy, such as in human capital and research. The Customs Union can be a powerful conduit for knowledge spillovers, but for Uganda to absorb these spillovers, it requires a strong absorptive capacity, a function of its human capital and institutional quality (Nelson & Phelps, 1966).

This synthesis creates the complete theoretical pathway for Uganda: The Gravity Model predicts that the EAC Customs Union will reduce C_{ij}, leading to an increase in trade flows (T_{ij}) while the Solow Model shows how this increased trade can boost the savings rate (s) and productivity (A), leading to a higher steady-state output, and the Endogenous Growth Theory clarifies that the sustained increase in the growth rate of A is not automatic. It is contingent on Uganda's absorptive capacity.

Therefore, the ultimate impact of the Customs Union on Uganda's economic growth is theoretically conditional. It depends not only on the trade-creating effect of the union itself but also on Uganda's complementary domestic policies that enhance its human capital and institutions, enabling it to transform increased trade into sustained, endogenous growth.

2.3 Empirical literature

This section reviews empirical studies related to the two core relationships under investigation: the effect of the EAC Customs Union on trade, and the subsequent effect of that trade on economic growth. The review synthesizes key findings and methodologies to situate the current study within the existing body of knowledge.

2.3.1 Effect of the East African Community Customs Union on Uganda's trade performance

Empirical evidence on the impact of the EAC Customs Union on Uganda's trade presents a nuanced picture of initial gains constrained by persistent structural and policy-related challenges.

Early ex-post assessments following the Union's establishment in 2005 reported positive outcomes. The East African Community Secretariat (EAC, 2006) documented a significant surge in intra-regional trade, a finding supported by academic research. Kabango and Mulinga (2015), analyzing the first decade, confirmed a substantial increase in Uganda's export volumes to partner states, attributing this growth directly to tariff elimination which enhanced the price competitiveness of Ugandan commodities like maize and beans.

However, this optimistic view is tempered by studies highlighting asymmetric trade benefits. Research by the Bank of Uganda (BOU, 2013) and later by Kuteesa & Tumuhe (2019) consistently identified a persistent and growing trade deficit for Uganda with Kenya. This imbalance is empirically linked to structural differences: Kenya's more diversified manufacturing base allows it to export high-value processed goods, while Uganda remains reliant on primary product exports. This suggests the Customs Union may have initially reinforced, rather than reduced, existing economic asymmetries.

Gravity model estimations have been widely used to quantify these effects. Musila and Sigué (2016) found a statistically significant positive effect of the EAC on trade flows, but disaggregated results often showed a smaller coefficient for Uganda compared to Kenya. This points to varying levels of trade responsiveness among members. Furthermore, studies like Sawere and Cuyvers (2018) and Mugisha et al. (2020) empirically demonstrated that Non-Tariff Barriers (NTBs) such as roadblocks, cumbersome border procedures, and standards-related issues severely erode the

benefits of tariff elimination, particularly for landlocked countries and perishable agricultural exports from Uganda.

Consequently, the literature has shifted towards analyzing the composition and quality of Uganda's trade. Studies by the Economic Policy Research Centre (EPRC, 2018) and Joughin (2020) show that despite increased volume, Uganda's export basket remains narrow and concentrated in low-value-added primary commodities. This lack of diversification is identified as a key constraint to maximizing the benefits of regional integration, underscoring the need for complementary domestic industrial policies.

2.3.2 Effect of intra-EAC trade on economic growth

The literature on the link between intra-EAC trade and economic growth also confirms a positive relationship but emphasizes the critical role of mediating factors.

Panel data studies across the EAC generally affirm this connection. Musila and Sigué (2016), using a gravity-augmented growth model, found that intra-EAC trade had a positive impact on member states' economic growth, citing benefits from larger markets and increased competition. However, they noted the effect was muted by infrastructural deficits and NTBs.

This introduces the concept of conditional effects. Research by Mafuso et al. (2021) used threshold regression models to show that the positive growth impact of intra-EAC trade becomes significant only after a certain level of institutional quality and infrastructural development is achieved. This finding is crucial as it explains varied growth outcomes and implies that trade liberalization is a necessary but not sufficient condition for growth.

Another critical channel explored is technology transfer. Focusing on Uganda, Bbaale and Mutenyo (2018) provided evidence that imports of capital and intermediate goods from Kenya were associated with higher Total Factor Productivity (TFP) in Ugandan firms. However, their study crucially highlighted that these spillovers are contingent on the host country's absorptive capacity, proxied by human capital, indicating that the growth returns from trade are higher in economies with a skilled workforce.

Table 2.1: Synthesis of empirical literature on the EAC customs union, trade, and growth

Theme	Key Findings	Identified Limitations and Context
Trade Creation	- Significant increase in intra-EAC trade volumes post-2005 (EAC, 2006; Kabango & Mulinga, 2015).	- Benefits are asymmetric; Uganda runs a persistent deficit (BOU, 2013; Kuteesa & Tumuhe, 2019).
	- Gravity models confirm a positive effect (Musila & Sigué, 2016).	- Uganda's trade responsiveness is lower than Kenya's.
Constraining Factors	- Non-Tariff Barriers (NTBs) significantly impede trade, negating tariff gains (Sawere & Cuyvers, 2018; Mugisha et al., 2020).	- Highlights a gap between de jure and de facto integration.
	- Uganda's exports remain undiversified and concentrated in primary commodities (EPRC, 2018; Joughin, 2020).	- Points to a lack of structural transformation in Uganda.
Trade-Growth Nexus	- A positive relationship exists between intra-EAC trade and economic growth (Musila & Sigué, 2016).	- The growth effect is conditional on institutional quality and infrastructure (Mafuso et al., 2021).
	- Trade facilitates technology transfer (Bbaale & Mutenyo, 2018).	- Spillovers depend on local absorptive capacity (human capital).

2.4 Research gap

While the existing literature provides valuable insights, it leaves several critical gaps that this study seeks to address, with a specific focus on Uganda's unique experience.

First, there is a notable scarcity of comprehensive, Uganda-centric analyses. Many studies, such as Buigut (2012), employ panel data across all EAC members, which risks obscuring country-specific effects and may average out outcomes that are particularly adverse or beneficial for Uganda. This study focused exclusively on Uganda to provide a detailed examination of its unique economic dynamics within the bloc.

Second, and most critically, there is a methodological gap in directly linking the Customs Union to economic growth through a clear transmission mechanism. Previous research, including early work by Okello (2008), often examined the trade effect on the growth effect in isolation, and relied on aggregated data that does not explicitly model the pathway from policy shock (Customs Union) to trade change to growth outcome. This study explicitly modelled this two-stage process, first analyzing the Customs Union's impact on trade performance, and then investigating the effect of this resultant intra-EAC trade on Uganda's economic growth, thereby providing a more complete causal narrative. In addition, it utilizes data up to 2024, capturing the longer-term, mature effects of the policy, including periods of significant global economic volatility, which allows for a more robust assessment of its sustained impact on Uganda's economy. By focusing specifically on Uganda, modeling the direct transmission mechanism, and employing recent data, this research aimed to fill these identified gaps and offered targeted insights for Ugandan policy.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter describes the research methodology that was used to achieve the stated objectives. It explains the sources of data, its coverage, and the number of data points for the study. It also outlines the modelling process and the tests that was undertaken to examine the effect of EAC customs union on Uganda's economic growth.

3.2 Research Design

This research was purely a time series study, examining how EAC customs union on Uganda's economic growth over a period spanning from 1994 to 2024. This approach enabled an in-depth analysis of long-term patterns and fluctuations in Uganda's economic growth in response to changes in EAC customs union.

3.3 Theoretical framework

This study was based on the theories of gravity model and the Solow growth models to address the objectives of the study. To estimate the effect of East African Community Customs Union on trade in Uganda, the study used the gravity model. The gravity model states that the volume of trade are estimated as an increasing function of the national incomes of trading partners and a decreasing function of the distance between them (Ng'ang'a, 2006).

Its origin goes back to the law of universal gravitation in physics which was developed by Newton (1687). The law of universal gravitation describes the gravitational force between two masses in relation to the distance that lies between these two masses (Newton, 1687). The Newton's gravity model theory states that the flow of people, ideas or commodities between two locations is positively related to their size and negatively related to the square of distance (Gosh and Yamarik, 2004).

$$trade_{ij} = A\frac{(GDP_i GDP_j)^{b_1}}{(distance_{ij})^{b_2}} \quad (3.1)$$

Where $trade_{ij}$ is the bilateral trade flows between country i and j, GDP_i and GDP_j are Gross Domestic Products (GDP) for country i and j respectively, $distance_{ij}$ measures the bilateral

distance between the two countries and A is a constant of proportionality. Based on the Newton's Law of gravity, the equation predicts that the volume of trade between two economies should increase with their size (proxied by real GDP) and decrease with transaction costs measured by the bilateral distance (Gosh and Yamarik, 2004).

The Solow growth model theoretical foundation was used to analyze the effect of Uganda's intra-EAC trade on its economic growth. The model concludes that output is a function of labor, capital and knowledge. The model also assumed that an economy always work itself to a steady state where each variable in the model grows at a constant rate and it follows the properties of the Cobb-Douglas production function (Romer, 2006) as shown in equation 3.2.

$$Y = f(K, L) \tag{3.2}$$

Where Y is the output, K & L is the level of capital, and Labour force respectively. The model also assumes that countries that are below their steady state level of the GDP per-capita should grow faster and countries that are above the steady state level of GDP should grow slower so as to approach the steady state (Feenstra, 2001).

3.4 Empirical model

This study adopted and extended the model by Mjema et al. (2012) in double log form and included other variables that affect bilateral trade flows to determine and analyze trade effects in Uganda from the creation of the EAC Customs Union. The stochastic form of the equation as shown in 3.3 was used to address objective one of the study.

$$lnTD_{ij} = \beta_0 + \beta_1 lnY_U + \beta_2 lnY_K + \beta_3 lnY_B + \beta_4 lnY_T + \beta_5 lnY_R + \beta_6 lnEAC_{ij} + \varepsilon_{ij} \tag{3.3}$$

Where TD_{ij} is the volume of trade between Uganda and the EAC member states, Y_U, is the GDP for Uganda, Y_K, Y_B, Y_T & Y_R are the GDPs for Kenya, Uganda, Burundi, Tanzania and Rwanda respectively. An EAC dummy variable is introduced to capture the two periods before and after the formation of the custom union. EAC_{ij} variable took the value zero when the period is the year 1994 to 2004; period before the custom union and one when the year is 2005 to 2024; the period after which the custom union came into effect, the ε_{ij} represent the error term. The dummy

variables are usually introduced to take into account other factors that affect bilateral trade, to avoid perfect collinearity and also to capture the time fixed effect (Buigut, 2012).

To answer the second objective, the study used the model developed by Seetenah (2008) and focused on only the volume of trade with EAC countries and the dummy variable for the formation of the EACCU in its log-log form as follows:

$$lnY_t = \alpha_0 + \alpha_1 lnTRADE + \alpha_2 lnEAC + \epsilon_i \quad (3.4)$$

Where Y_t is the GDP growth rate at time t for Uganda, α_0 is the constant term, α_1, and α_2 represent the elasticity of output relative to volume of trade and dummy of EAC customs union, $TRADE$ represents volume of trade to EAC member states and the ϵ_i represent the error term.

Equation (3.3) and (3.4) were estimated using estimated using ordinary least squares and Vector Error Correction Model respectively.

3.5 Measurement of variables

Table 3.1 presents the variables used in the study, along with their definitions and sources.

Table 3.1: Definition of Variables and their Expected Signs

Variables	Description and Measurement	Expected Sign
$TRADE$	This is the total value of imports and exports within Kenya to the member countries in the custom union measured by the reported values in US dollars.	+
Y_i	Y_i is the annual gross domestic product for Uganda and Y_j is the individual gross domestic product of the other EAC member countries at a given time measured in country statistical data in US dollars.	+
EAC	This is a dummy variable which takes the value of one if the period is between 2005 and 2024 and zero when the period is between 1994 and 2004.	$\pm$

3.6 Data sources

This study used annual secondary data covering a period of 31 years that is 1994 to 2024. Data was collected from World Development Indicators and the Bank of Uganda.

3.7 Data processing/ analysis techniques

The data for this study was processed and analyzed using EViews 9.2 software.

3.7.1 Descriptive statistics and correlation analysis

The initial analysis involved generating descriptive statistics for the variables, including measures such as the mean, standard deviation, minimum, and maximum values. These statistics provided insights into the central tendency and dispersion of the data, laying a foundation for deeper analysis. In addition, a correlation matrix was constructed to examine the relationships among variables and to detect potential multicollinearity, which could have undermined the robustness of regression results if correlations were excessively high.

3.7.2 Stationarity test using Augmented Dickey Fuller test

In theory, a vector Z_t is said to be integrated of order d ($Z_t \sim I(d)$) if variables in Z_t can be differenced d times to induce Stationarity. To determine the series, order of integration and the degree of differencing required to induce stationarity, the Augmented Dickey Fuller (ADF) unit root test was employed (Dickey & Fuller, 1979). The ADF specification was of the form:

$$\Delta Z_t = C_0 + C_1 t + \gamma Z_{t-1} + \sum_{i=1}^{\rho} \delta_i + \varepsilon_t \qquad (3.5)$$

Where, C_0 is the intercept term, C_1 and γ are coefficients of time trend and level of lagged dependent variable respectively, Δ is the first difference operator and ε_t are white noise residuals. ρ is the lag- length introduced to account for autocorrelation, which was chosen using the minimum of the information criteria. The null hypothesis is that there is a unit root. The null hypothesis is rejected if the absolute value of ADF test statistic exceeds the critical values at 5%.

3.3.4 Co-integration Test

Due to the non-stationarity of many time series data, the study used Johansen and Juselius (1990) maximum likelihood's procedure to examine the existence of possible long run relationships among the variables in the model. The technique developed by Johansen and Juselius (1990) is widely believed that variables hypothesized to have some theoretical economic relationship should not diverge from each other in the long run. Although such variables may drift apart in the short run, they converge towards equilibrium in the long run. In this study, Johansen and Juselius (1990) maximum likelihood's procedure was adopted to determine whether the variables are integrated

of the same order as the dependent variable. This method enabled the researcher to determine the number of cointegrating vectors among variables in consideration. The Johansen and Juselius (1990) maximum likelihood's equation is of the form;

$$\Delta Y_t = \sum_{i=1}^{p-1} \Pi_i \Delta Y_{t-i} + \Pi Y_{t-p} + \varepsilon_t \qquad (3.6)$$

Where: p = optimal lag length

$\Pi_i = -\left[I - \sum_{j=1}^{j=i} A_j \right]$ is the trace statistics

$\Pi = -\left[I - \sum_{i=1}^{i=p} A_i \right]$ is the Eigen value statistics

ε_t = is serially uncorrelated error term

Δ = is the first difference operator

Y = vector of regressors

Equation (3.6) is the fundamental equation in testing for cointegration. It contains information on both the short-run and long run adjustments to changes in Y_t via the estimation of Π_i and Π matrices. The key feature in equation (3.6) is the rank of Π matrix which is equal to the number of independent cointegrating equations. If the rank of Π matrix is null, then equation 3.6 is the VAR in first differences and there is no cointegrating vector; but if r (Π) is K, then the matrix has full rank and the vector is stationary with K cointegrating vectors.

3.3.5 Vector Error Correction Model (VECM)

After establishing that all variables were integrated of order one and confirming the presence of a long-run equilibrium relationship through co-integration testing, a Vector Error Correction Model (VECM) was estimated to examine the dynamic interactions among the variables. The VECM framework was appropriate because it links short-run adjustments to long-run equilibrium by incorporating an error correction term, which captures the speed at which deviations from the long-run relationship are corrected. As noted by Asari (2011), when co-integration exists, changes in the dependent variable are driven not only by contemporaneous movements in the explanatory

variables but also by the extent of disequilibrium indicated by the error correction term. Gujarati (2004) further emphasizes that when two or more variables are co-integrated, their relationship can be effectively modelled using an Error Correction Model (ECM), which ensures that short-run dynamics are consistent with the long-run equilibrium.

Given the model:

$$Y_t = \alpha_0 + \alpha_1 X_t + \gamma_t \quad (3.16)$$

Then ECM can be expressed as:

$$\Delta Y_t = \beta_0 + \beta_1 \Delta X_t + \beta_2 ECM_{t-1} + \epsilon_t \quad (3.17)$$

Where:

Δ denotes the first difference operator; Y and X are first difference variables; β_0 is the intercept; $\beta_1$is the short run coefficient; β_2 is the coefficient of the error correction term; ϵ_t is a random (white noise) error term; ΔY_t is the first difference of the dependent variable; ΔX_t is the first difference of the independent variables; ECM_{t-1} is the error correction term.

The expression ECM_{t-1} is the one period lagged residual of the model. It is also known as the equilibrium error term of one period lag or the error correction term that guides the variables (Y and X) to restore back to equilibrium. In other words ECM_{t-1}corrects the disequilibrium.

The coefficient (β_2) of the error term (ECM_{t-1}) is the rate at which the systems previous period's disequilibrium is corrected. When β_2 is significant and contains a negative sign, it means that there exists a long run equilibrium relationship among the variables.

3.3.6 Residual and stability diagnostic tests

3.3.6.1 Residual diagnostics

To evaluate the goodness of fit and overall reliability of the estimated model, a number of diagnostic tests were conducted to ensure that the results accurately reflected the underlying data-generating process. These procedures included the Jarque-Bera test, which was used to assess whether the residuals followed a normal distribution - a key assumption for valid statistical inference. The Breusch–Godfrey Lagrange Multiplier (LM) test was employed to detect the

presence of serial correlation in the residuals, which, if unaddressed, could bias standard errors and compromise the validity of hypothesis tests. Additionally, the Breusch–Pagan LM test was applied to examine heteroscedasticity, ensuring that the variance of the residuals remained constant across observations. Collectively, these diagnostic checks strengthened the credibility of the model by confirming that the underlying assumptions of the regression framework were not violated.

3.3.6.2 Stability diagnostics

The study employed a structural break analysis using the Chow Breakpoint Test to determine whether the establishment of the EAC Customs Union in 2005 introduced a statistically significant shift in Uganda's economic growth trajectory. This test was particularly appropriate given the policy's potential to alter key macroeconomic relationships by reducing trade barriers, enhancing market integration, and influencing trade-driven growth mechanisms.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

This chapter presents and discusses the empirical results of the study in line with its two main objectives: (i) to examine the effect of the East African Community (EAC) Customs Union on Uganda's trade performance, and (ii) to determine the effect of intra-EAC trade on Uganda's economic growth. The chapter begins with the presentation of descriptive statistics, correlation analysis, and stationarity test results to provide an overview of the data characteristics. Both models were examined through the Vector Error Correction Model (VECM) to capture both the short-run and long-run dynamics of the relationship.

4.1 Objective one: Effect of the East African Community (EAC) Customs Union on Uganda's trade performance

To address the first objective of examining the effect of the East African Community (EAC) Customs Union on Uganda's trade performance, descriptive statistics, correlation analysis, lag length criteria, stationarity tests, cointegration test, and regression analysis together with stability and residual diagnostic tests were conducted, as presented in the subsequent sections.

4.1.1 Descriptive statistics

The descriptive statistics in Table 4.1 provide initial insights into Uganda's trade performance with its East African Community (EAC) partners and how this performance evolved around the establishment of the EAC Customs Union in 2005. The mean value of logged trade volume (LTRADE = 20.508) indicates a generally high and steadily increasing level of intra-EAC trade, consistent with the expectation that regional integration stimulates cross-border trade by lowering tariff and non-tariff barriers (Balassa, 1961; Frankel & Romer, 1999). The narrow dispersion in trade volume (Std. Dev. = 0.873) suggests stable trade flows over the study period, implying that Uganda's trade with EAC partners followed a predictable pattern and may have been structurally influenced by long-term integration commitments and geographical proximity, as suggested by the Gravity Model (Tinbergen, 1962; Anderson & van Wincoop, 2003).

Table 4.1: Descriptive statistics

	LTRADE	LTOTAL_EAC_GDP	EAC
Mean	20.508	25.487	0.645
Median	20.590	25.478	1.000
Maximum	22.068	26.234	1.000
Minimum	19.067	24.780	0.000
Std. Dev.	0.873	0.457	0.486
Skewness	-0.092	0.038	-0.607
Kurtosis	1.888	1.661	1.368
Jarque-Bera	1.642	2.322	5.342
Probability	0.440	0.313	0.069
Observations	31	31	31

Note: *LTRADE denotes logged Uganda's trade volume with East African Countries (Kenya, Tanzania, Burundi and Rwanda); LTOTAL_EAC_GDP denotes logged total East African Countries (Uganda, Kenya, Tanzania, Burundi and Rwanda); EAC denotes 2005 East African Customs Union dummy*

The descriptive patterns also reveal important dynamics regarding the economic mass of the EAC region. The mean of the logged total EAC GDP (L TOTAL_EAC_GDP = 25.487) shows that Uganda traded within a significantly large and growing regional economic bloc. The low skewness (0.038) and low standard deviation (0.457) for this variable indicate relatively stable economic performance across the partner states during the period. This aligns with theoretical predictions that trade volumes rise as the economic size of trading partners expands, owing to the increased availability of markets and complementary goods (Krugman, 1980; Helpman & Krugman, 1985). Given that GDP serves as a proxy for economic mass in the Gravity Model, the observed steady increase suggests that Uganda benefited from expanding demand and production capacity within the EAC, which would be expected to enhance trade performance even before controlling for policy changes such as the Customs Union.

The dummy variable representing the EAC Customs Union (EAC = 1 for post-2005; mean = 0.645) indicates that approximately 64.5% of the sample period falls under the post-Union era, enabling a meaningful comparison of pre- and post-integration trade outcomes. The shift from the minimum value (0) to the maximum value (1) captures the structural change brought by the Union, which theoretically reduces trade costs and promotes trade creation (Viner, 1950; Schiff & Winters, 2003). Although the Jarque–Bera statistics for all variables indicate approximate normality (p-values > 0.05, except the dummy), the presence of mild skewness in the EAC dummy is expected

given its binary nature. Overall, these descriptive findings support the hypothesis that the EAC Customs Union created favourable conditions for enhanced trade performance, as reflected in the relatively high trade volumes, stable GDP growth among partner states, and the structural shift introduced by regional integration. These patterns justify further econometric analysis to quantify the actual effect of the Customs Union on Uganda's trade within the bloc.

4.1.2 Correlation analysis

The correlation matrix in Table 4.2 shows moderately high positive associations between Uganda's trade volume (LTRADE) and the explanatory variables. Specifically, LTRADE is strongly correlated with LTOTAL_EAC_GDP (r = 0.955), which is theoretically consistent with the Gravity Model of trade, where the economic size of trading partners positively influences bilateral trade (Tinbergen, 1962; Anderson & van Wincoop, 2003). The correlation between LTRADE and the EAC Customs Union dummy (r = 0.656) further indicates that trade volumes increased during the post-Customs Union period, reflecting the expected trade-creating effects of regional integration (Viner, 1950; Schiff & Winters, 2003). Although LTOTAL_EAC_GDP and the EAC dummy also exhibit a high correlation (0.759), such associations are typical in time-series studies where economic size grows over time alongside policy changes. Importantly, correlation alone does not confirm problematic multicollinearity; it simply highlights economic relationships that align with theoretical expectations.

Table 4.2: Correlation matrix

	LTRADE	LTOTAL_EAC_GDP	EAC
LTRADE	1.000	0.955	0.656
LTOTAL_EAC_GDP	0.955	1.000	0.759
EAC	0.656	0.759	1.000

To formally assess multicollinearity, the Variance Inflation Factor (VIF) results in Table 4.3 provide a more reliable diagnostic. Both LTOTAL_EAC_GDP and the EAC dummy have centered VIF values of 3.37, which fall well below the commonly accepted thresholds of 5 or 10 for detecting harmful multicollinearity (Gujarati, 2004; Wooldridge, 2016). This indicates that although the variables are correlated, they do not inflate the variances of the coefficient estimates to a level that threatens statistical validity. Therefore, multicollinearity is not a concern in this model, and the explanatory variables can be retained without adjustment. The results confirm that

the estimated effects of the EAC Customs Union and total EAC GDP on Uganda's trade performance are statistically reliable and not distorted by multicollinearity.

Table 4.3: Variance Inflation Factor

Variable	Coefficient Variance	Centered VIF
LTOTAL_EAC_GDP	0.017	3.370
EAC	0.015	3.370
C	10.525	NA

4.1.3 Optimal Lag length determination

The choice of the lag length was determined on the minimum number of lags that met the crucial assumption of time independence of residuals, based on the Langrage Multiplier test (Maddala, 1992). The optimal lag length ρ was determined using the Akaike Information Criterion (AIC), Hannan and Quinn Information Criteria (HQ) and Schwartz Bayesian Information Criterion (SC). Table 4.4 presents the optimal lag length using AIC, HQIC and SBIC.

Table 4.4: Lags to estimate

Lag	AIC	SC	HQ
0	0.862	1.003	0.906
1	-6.859*	-6.293*	-6.682*
2	-6.839	-5.849	-6.529

* indicates lag order selected by the criterion (each test at 5% level)
AIC: Akaike information criterion SBIC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

From Table 4.4, the maximum lag length is 1 and the Schwarz information criterion in absolute terms was 6.29 and was used as basis for the selection of the optimal lag length. This was chosen due to the fact that the Schwarz information criterion was less than both the Akaike information criterion and Hannan-Quinn information criteria which were 6.859 and 6.682 in absolute terms respectively.

4.1.4 Stationarity test

The Augmented Dickey-Fuller (ADF) stationarity test results presented in Table 4.3 indicate that the variables exhibit mixed orders of integration, implying that some series are stationary at level while others become stationary after differencing.

Table 4.5: Stationarity test using Augmented Dickey-Fuller test

	ADF stat	5% critical value	Order of integration	ADF stat	5% critical value	Order of integration
LTRADE	-3.372	-3.568	I(1)	-5.378	-3.581	I(0)
LTOTAL_EAC_RGDP	-1.945	-3.568	I(1)	-4.302	-3.574	I(0)
EAC	-1.625	-3.568	I(1)	-5.353	-3.574	I(0)

Note: *H_0 is rejected if the absolute value of the ADF test statistic exceeds the critical values at 5%.*

The Augmented Dickey–Fuller (ADF) results in Table 4.5 indicate that all variables - Uganda's trade volume (LTRADE), total EAC real GDP (LTOTAL_EAC_RGDP), and the EAC Customs Union dummy are non-stationary at levels, as their test statistics do not exceed the 5% critical values. This implies the presence of a unit root, which is common in macroeconomic time-series data that grow over time. However, after first differencing, all variables become stationary at the 5% significance level, confirming that they are integrated of order one, I(1). The transformation from non-stationarity at levels to stationarity after differencing validates that the series follow a similar order of integration, a necessary condition for cointegration testing. These findings ensure that any regression involving the level variables does not produce spurious results arising from non-stationary time series (Gujarati, 2004; Wooldridge, 2016).

4.1.5 Testing for co-integration

The Johansen cointegration test results in Table 4.6 reveal the existence of one cointegrating equation, as the trace statistic for the "None" hypothesis (44.014) exceeds the 5% critical value (29.797), with a p-value of 0.001. This indicates that a stable long-run equilibrium relationship exists among Uganda's trade volume, total EAC GDP, and the EAC Customs Union dummy. The absence of additional cointegrating vectors suggests that while the variables are jointly influenced by one long-run forcing relationship, short-run adjustments may still differ across variables. The presence of cointegration implies that despite short-term fluctuations, the variables move together over time towards a common long-run path consistent with economic integration theory, which posits that trade volumes and regional GDP evolve jointly as integration deepens (Viner, 1950; Frankel & Rose, 1998).

Table 4.6: Johansen Unrestricted Cointegration Rank Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.697	44.014	29.797	0.001
At most 1	0.299	10.620	15.495	0.236
At most 2	0.024	0.671	3.841	0.413
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

Given that all variables are integrated of order one and cointegrated, the VECM is the most appropriate modeling framework for this study. The VECM is specifically designed for situations where variables share a long-run equilibrium but may exhibit short-run deviations that require correction. The existence of a significant cointegrating vector justifies an error-correction representation, where short-run dynamics are linked to long-term steady-state conditions through the error correction term (Engle & Granger, 1987). This allows the model to capture both immediate responses in trade performance following changes in regional GDP or the implementation of the EAC Customs Union, as well as the gradual adjustment back to long-run equilibrium whenever shocks occur.

Moreover, the VECM framework provides a superior analytical approach for addressing the study's first objective of examining the effect of the EAC Customs Union on Uganda's trade performance since it enables the identification of both short-run causal relationships and long-run structural adjustments that arise from economic integration. Unlike standard VAR models, which ignore long-run relationships, the VECM preserves these equilibrium conditions, ensuring more accurate and theoretically consistent results. Therefore, the adoption of VECM is methodologically sound and aligns with established econometric practice for analyzing trade and integration dynamics in time-series settings.

4.1.6 Stability test

The results of the Chow Breakpoint Test presented in Table 4.7 provide strong statistical evidence of a structural break in 2005, the year the East African Community (EAC) Customs Union was launched. The F-statistic of 6.164 is highly significant, with a corresponding p-value of 0.0002, well below the 5% threshold, indicating that the model parameters before and after 2005 differ significantly. Similarly, both the Log Likelihood Ratio and Wald Statistics yield p-values of 0.0001, reinforcing the conclusion that the introduction of the Customs Union marked a major shift in Uganda's trade dynamics. These results collectively suggest that the policy intervention that is the establishment of the EAC Customs Union had a statistically significant effect on the behavior of the variables in the model. Therefore, the structural break test confirms that 2005 represents a meaningful turning point in Uganda's trade performance, justifying its treatment as a critical policy dummy variable in the study.

Table 4.7: Chow Breakpoint Test: 2005

F-statistic	6.164	Prob. F(3,25)	0.0002
Log likelihood ratio	23.864	Prob. Chi-Square(3)	0.0001
Wald Statistic	24.655	Prob. Chi-Square(3)	0.0001

4.1.7 Regression results

The long-run cointegration equation shows that total EAC GDP has a strong and negative influence on Uganda's trade performance (coefficient = –1.819, significant at 1%), suggesting that increases in the economic size of partner states are associated with a widening trade imbalance for Uganda. This result aligns with the Gravity Model of Trade, which posits that trade between two economies increases with economic size but not necessarily symmetrically (Tinbergen, 1962; Anderson & van Wincoop, 2003). Larger and more industrialized partners such as Kenya and Tanzania may supply manufactured and value-added goods to Uganda at a scale and quality that Uganda cannot reciprocate, reinforcing structural asymmetries predicted in the extended model where differences in production capacity shape trade outcomes. The absence of a statistically significant long-run effect of the EAC dummy ($p > 0.1$) implies that while the Customs Union reduced formal trade barriers, tariff elimination alone did not fundamentally alter Uganda's trade structure. This finding is consistent with Musila & Sigué (2016) and Kabango & Mulinga (2015), who observe that

Uganda's trade response to regional integration is limited by its narrow export base and heavy reliance on low-value primary commodities.

Table 4.8: Effect of the East African Community (EAC) Customs Union on Uganda's trade performance

Cointegrating Eq:	**CointEq1**
LTRADE(-1)	1.000
LTOTAL_EAC_GDP(-1)	-1.819*** (-0.128) [-14.164]
EAC(-1)	0.017 (-0.120) [0.144]
C	25.843
Error Correction:	**D(LTRADE)**
CointEq1	-0.727*** (-0.212) [-3.433]
D(LTRADE(-1))	0.379* (-0.196) [1.938]
D(LTOTAL_EAC_GDP(-1))	4.220* (-2.164) [1.950]
D(EAC(-1))	-0.302* (-0.161) [-1.874]
C	-0.134 (-0.113) [-1.183]

*Note: Standard errors in ( ) & t-statistics in [ ]; ***, ** & * denote significance at 1%, 5% and 10%*

The short-run VECM results reveal dynamic adjustments consistent with both the Solow Growth Model and endogenous growth perspectives. The negative and statistically significant error-correction coefficient (–0.727, $p < 0.01$) indicates that deviations from the long-run equilibrium are corrected at a relatively fast speed of adjustment, meaning that Uganda's trade flows gradually respond to macroeconomic shifts within the EAC. The positive short-run effects of past changes in both Uganda's trade (D(LTRADE(–1))) and total EAC GDP (D(LTOTAL_EAC_GDP(–1))) suggest that short-term fluctuations in regional economic activity are associated with temporary improvements in Uganda's trade performance. This supports the Solow model's prediction that increased external demand and market size can enhance capital accumulation through export earnings (Solow, 1956). However, the weak long-run effect of the Customs Union dummy and the modest short-run coefficients highlight the importance of endogenous mechanisms such as technology transfer, firm learning, and human capital building in sustaining growth from trade. As Romer (1990) and Nelson & Phelps (1966) argue, countries with limited absorptive capacity derive fewer dynamic productivity gains from integration, a pattern consistent with Uganda's experience.

The VECM findings must be interpreted in the context of persistent structural constraints that limit Uganda's ability to benefit fully from the EAC Customs Union. Empirically, Uganda continues to

face higher logistics costs due to its landlocked geography, congested transport corridors, and weak storage and cold-chain systems, all of which increase the price of exporting agricultural products (BOU, 2013; EPRC, 2018). Non-Tariff Barriers (NTBs) including roadblocks, cumbersome customs documentation, variable product standards, and occasional border closures erode the expected gains from tariff elimination. Studies by Sawere & Cuyvers (2018) and Mugisha et al. (2020) confirm that NTBs disproportionately affect Ugandan exporters, especially small-scale agricultural producers dealing in perishable goods. Institutional weaknesses such as slow certification processes, limited trade facilitation capacity, and inconsistent enforcement of EAC protocols further restrict Uganda's ability to penetrate regional markets. These factors help explain why the EAC dummy shows no significant long-run effect in the VECM despite theoretical expectations from the Gravity Model that integration should increase trade volumes.

The overall VECM results align with broader empirical evidence showing that Uganda's trade response to regional integration is positive but constrained. While intra-EAC trade has grown since 2005, studies consistently show that the benefits are uneven across member states (EAC, 2006; Kuteesa & Tumuhe, 2019). Kenya, with a more advanced manufacturing sector, captures greater gains, while Uganda remains structurally dependent on low-value exports, limiting its capacity to leverage the Customs Union for long-term growth. The weak long-run impact of the EAC dummy in the VECM echoes findings by Mafuso et al. (2021) that trade liberalization enhances growth only when supported by adequate institutional quality, infrastructure, and production capabilities. The significant adjustment dynamics in the model indicate that Uganda responds to regional economic signals, yet its structural limitations impede the translation of trade integration into persistent long-run gains. Thus, the results are theoretically coherent, the Customs Union reduced formal barriers, but without improvements in productivity, logistics, and institutional efficiency, Uganda's trade performance remains below its potential.

4.1.7.1 Residual diagnostics

The LM test results (LM-Stat = 12.774; p = 0.1731) in Table 4.9 indicate that the null hypothesis of no serial correlation in the residuals cannot be rejected at conventional significance levels. This implies that the VECM residuals are independently distributed over time and do not exhibit autocorrelation problems. The absence of serial correlation is essential for the reliability of the estimated parameters because it confirms that the model appropriately captures the dynamic

structure of the data and that there are no omitted lagged effects influencing the results. Overall, the LM statistic suggests that the model's lag structure is sufficient and that the short-run dynamics are correctly specified.

Table 4.9: VEC Residual Serial Correlation LM Tests

Lags	LM-Stat	Prob
1	12.774	0.1731

The results of the VEC residual normality tests in Table 4.10 further confirm the adequacy of the model. All individual Jarque-Bera statistics show high p-values (0.916, 0.703, and 0.197), and the joint statistic also yields a p-value of 0.388. These results indicate that the null hypothesis of multivariate normality of residuals cannot be rejected. Normality of residuals is particularly important in the context of VECM because it ensures the validity of likelihood-based inference, including the Johansen cointegration tests and t-statistics for parameter estimates. The fact that all components satisfy the normality requirement suggests that the disturbances behave in accordance with the assumptions of the model, enhancing the robustness and interpretability of the estimated long-run and short-run coefficients.

Table 4.10: VEC Residual Normality Tests

Component	**Jarque-Bera**	**Prob***
1	0.037	0.916
2	0.706	0.703
3	3.252	0.197
Joint	2.320	0.388

The heteroskedasticity test in Table 4.11 also supports the reliability of the VECM estimates. The joint Chi-square statistic of 34.733 with 42 degrees of freedom yields a p-value of 0.7793, indicating that the null hypothesis of homoscedastic residuals cannot be rejected. This means that the error terms exhibit constant variance over time and do not suffer from heteroskedastic distortions. Homoskedasticity reinforces the efficiency of model estimates and ensures that standard errors, hypothesis tests, and confidence intervals are not biased.

Table 4.11: Table 4.11: VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)

Chi-sq	df	Prob.
34.73301	42	0.7793

Together with the results of the serial correlation and normality tests, the heteroskedasticity test confirms that the VECM is well-specified, the underlying assumptions are satisfied, and the estimated relationships can be interpreted with confidence.

4.2 Objective Two: Effect of intra-EAC trade on Uganda's economic growth

To address the second objective of examining the effect of intra-EAC trade on Uganda's economic growth, descriptive statistics, correlation analysis, lag length criteria, stationarity tests, cointegration, and regression analysis together with both stability and residual diagnostics were conducted, as presented in the subsequent sections.

4.2.1 Descriptive statistics

The descriptive statistics in Table 4.12 provide important preliminary insights into the relationship between intra-EAC trade and economic growth in Uganda. Uganda's GDP growth rate (LGDPGR) exhibits moderate stability, with a mean of 1.742 and a relatively low standard deviation of 0.375, suggesting limited volatility during the study period. This stability is consistent with empirical literature indicating that East African economies experienced relatively steady growth following the early 2000s due to macroeconomic reforms and improved regional integration efforts (World Bank, 2018; UNECA, 2020). The trade variable (LTRADE) shows a mean of 20.508 with a wider dispersion (standard deviation = 0.873), implying more fluctuations in Uganda's trade volumes within the EAC. This variability reflects both changes in regional economic activity and periodic disruptions such as non-tariff barriers and border closures, which have been documented as structural challenges to intra-EAC trade (Odhiambo, 2021; EAC Secretariat, 2019). The Customs Union dummy (EAC) has a mean of 0.645, signifying that approximately 65% of the observations lie in the post-2005 period, reinforcing the importance of examining whether the Customs Union regime altered the trade–growth relationship.

Table 4.12: Descriptive statistics

	LGDPGR	LTRADE	EAC
Mean	1.742	20.508	0.645
Median	1.729	20.590	1.000
Maximum	2.444	22.068	1.000
Minimum	1.082	19.067	0.000
Std. Dev.	0.375	0.873	0.486
Skewness	0.014	-0.092	-0.607
Kurtosis	2.123	1.888	1.368
Jarque-Bera	0.994	1.642	5.342
Probability	0.608	0.440	0.069
Observations	31	31	31

Note: *LGDPGR denotes logged GDP growth rate; LTRADE denotes logged Uganda's trade volume with East African Countries (Kenya, Tanzania, Burundi and Rwanda) [data in US dollars]; & EAC denotes 2005 East African Customs Union dummy*

The distributional properties of the variables also provide insight into the suitability of the dataset for further econometric analysis. The skewness and kurtosis values for GDP growth (LGDPGR) and trade (LTRADE) lie within acceptable ranges, and the Jarque–Bera probabilities (0.608 and 0.440 respectively) indicate that both variables are normally distributed, supporting the validity of subsequent regression-based inference (Gujarati & Porter, 2009). Although the EAC dummy variable shows mild skewness (-0.607) and a borderline normality test (p = 0.069), this is expected for a binary policy variable and does not pose statistical concerns. Overall, the descriptive statistics suggest that intra-EAC trade expanded significantly during the post-Customs Union period, and GDP growth remained relatively stable aligning with studies that argue regional integration enhances market access, lowers trade costs, and supports macroeconomic performance (Balassa, 2013; Musonda, 2014). These preliminary trends justify deeper empirical investigation of how trade flows within the EAC may have influenced Uganda's economic growth trajectory over time.

4.2.2 Pairwise Correlation

The correlation matrix in Table 4.13 reveals moderate associations among the variables, but none are strong enough to indicate problematic multicollinearity. GDP growth (LGDPGR) is negatively correlated with both intra-EAC trade (LTRADE) at –0.494 and the EAC dummy at –0.246. These moderate negative correlations suggest that higher trade volumes or the post–Customs Union period do not mechanically move in the same direction as short-run GDP growth, consistent with

empirical literature showing that the growth effects of regional integration often materialize slowly due to structural rigidities, supply constraints, and adjustment costs (Mafuso et al., 2021; Bbaale & Mutenyo, 2018). The correlation between LTRADE and the EAC dummy is 0.656, which reflects the expected rise in trade volumes after the 2005 establishment of the Customs Union. Although this correlation is relatively high, it remains below the commonly accepted threshold of 0.80, indicating that the relationship does not compromise model stability. Overall, the correlation patterns suggest meaningful economic relationships without posing risks to the reliability of the subsequent regression estimates.

Table 4.13: Correlation matrix

	LGDPGR	LTRADE	EAC
LGDPGR	1.000	-0.494	-0.246
LTRADE	-0.494	1.000	0.656
EAC	-0.246	0.656	1.000

The Variance Inflation Factor (VIF) results provide further confirmation that multicollinearity is not a concern in the analysis. Both LTRADE and the EAC dummy have a centered VIF of 3.347, well below the widely accepted thresholds of 5 or 10 used in econometric literature to flag harmful multicollinearity (Gujarati & Porter, 2009; Wooldridge, 2016). These VIF values indicate that although the two variables are moderately correlated as expected in a post-integration context, their collinearity does not inflate standard errors sufficiently to distort coefficient estimates or weaken statistical inference. The stability of the VIF results ensures that each variable retains distinct explanatory power in estimating the effect of intra-EAC trade on Uganda's economic growth. Therefore, both the correlation matrix and the VIF diagnostics collectively rule out the presence of problematic multicollinearity, supporting the suitability of the variables for inclusion in the regression and VECM models.

Table 4.14: Variance Inflation Factor

Variable	Coefficient Variance	Centered VIF
LTRADE	0.015	3.347
EAC	0.049	3.347
C	5.857	NA

4.2.3 Optimal Lag length determination

The choice of the lag length was determined on the minimum number of lags that met the crucial assumption of time independence of residuals, based on the Langrage Multiplier test (Maddala, 1992). The optimal lag length ρ was determined using the Akaike Information Criterion (AIC), Hannan and Quinn Information Criteria (HQ) and Schwartz Bayesian Information Criterion (SC). Table 4.15 presents the optimal lag length using AIC, HQIC and SBIC.

Table 4.15: Optimal Lag length determination

Lag	AIC	SC	HQ
0	3.324	3.466	3.368
1	-0.024*	0.542*	0.153*
2	0.223	1.213	0.533

From Table 4.15, the maximum lag length is 1 and the Akaike information criterion in absolute terms was 0.024 and was used as basis for the selection of the optimal lag length. This was chosen due to the fact that the Akaike information criterion was less than both the Schwarz information criterion and Hannan-Quinn information criteria which were 0.542 and 0.152 in absolute terms respectively.

4.2.4 Stationarity test

The Augmented Dickey–Fuller (ADF) test results indicate that all the variables that is GDP growth (LGDPGR), intra-EAC trade (LTRADE), and the EAC Customs Union dummy (EAC) are non-stationary at levels but become stationary after first differencing, implying that they are integrated of order one, I(1). For instance, LGDPGR has an ADF statistic of -2.838 at level, which does not exceed the 5% critical value of –3.603, but after differencing, the ADF statistic strengthens to -7.754, surpassing the 5% threshold of -3.581, confirming stationarity. Similar patterns are observed for LTRADE and EAC. The presence of I(1) variables is typical in macroeconomic time series, especially for trade and growth indicators, which tend to evolve over time rather than fluctuate around a constant mean (Wooldridge, 2016; Greene, 2018). This consistent order of integration among the variables is a necessary precondition for examining long-run equilibrium relationships through cointegration analysis.

Table 4.16: Stationarity test using Augmented Dickey-Fuller test

Variables	Augmented Dickey-Fuller test in level			Augmented Dickey-Fuller test in first difference		
	ADF stat	5% critical value	Order of integration	ADF stat	5% critical value	Order of integration
LGDPGR	-2.838	-3.603	I(1)	-7.754	-3.581	I(0)
LTRADE	-2.059	-3.548	I(1)	-6.493	-3.558	I(0)
EAC	-1.153	-3.548	I(1)	-5.336	-3.553	I(0)

Note: *H_0 is rejected if the absolute value of the ADF test statistic exceeds the critical values at 5%.*

4.2.5 Testing for co-integration

The Johansen cointegration test further reveals that the three variables share one statistically significant long-run cointegrating relationship, as indicated by a trace statistic of 21.861 that exceeds the 5% critical value of 21.132 (p = 0.039). This confirms that although the variables are individually non-stationary, they move together over time and converge to a stable long-run equilibrium path, a key theoretical expectation when analyzing how trade influences economic growth within the framework of regional integration (Engle & Granger, 1987; Johansen, 1991). Given that all variables are I(1) and cointegrated, the Vector Error Correction Model (VECM) becomes the most appropriate modelling approach. VECM not only captures the short-run dynamics between intra-EAC trade and economic growth but also incorporates the error-correction term that measures how quickly deviations from the long-run equilibrium are corrected. This dual capacity of modelling short-run adjustments while maintaining long-run equilibrium consistency makes VECM superior to VAR in levels or differences, which would either ignore cointegration or risk model misspecification. Thus, the cointegration evidence fully justifies the use of the VECM for estimating Uganda's growth response to intra-EAC trade.

Table 4.17: Johansen Unrestricted Cointegration Rank Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.542	21.861	21.132	0.039
At most 1	0.177	5.440	14.265	0.686
At most 2	0.006	0.163	3.841	0.686
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

4.2.6 Stability test

The Johansen cointegration test in Table 4.18 further reveals that the three variables share one statistically significant long-run cointegrating relationship, as indicated by a trace statistic of 21.861 that exceeds the 5% critical value of 21.132 ($p = 0.039$). This confirms that although the variables are individually non-stationary, they move together over time and converge to a stable long-run equilibrium path, a key theoretical expectation when analyzing how trade influences economic growth within the framework of regional integration (Engle & Granger, 1987; Johansen, 1991). Given that all variables are I(1) and cointegrated, the Vector Error Correction Model (VECM) becomes the most appropriate modelling approach. VECM not only captures the short-run dynamics between intra-EAC trade and economic growth but also incorporates the error-correction term that measures how quickly deviations from the long-run equilibrium are corrected. This dual capacity of modelling short-run adjustments while maintaining long-run equilibrium consistency makes VECM superior to VAR in levels or differences, which would either ignore cointegration or risk model misspecification. Thus, the cointegration evidence fully justifies the use of the VECM for estimating Uganda's growth response to intra-EAC trade.

Table 4.18: Chow Breakpoint Test: 2005

F-statistic	6.655	Prob. F(3,25)	0.0003
Log likelihood ratio	19.373	Prob. Chi-Square(3)	0.0002
Wald Statistic	19.963	Prob. Chi-Square(3)	0.0002

4.2.7 Vector Error Correction model results

The VECM long-run equation in Table 4.19 shows that intra-EAC trade (LTRADE) has a positive and statistically significant long-run effect on Uganda's economic growth, with a coefficient of 0.458 ($t = 3.658$). This finding is consistent with the Gravity Model of Trade, which predicts that reductions in trade costs such as the removal of tariffs under the EAC Customs Union expand trade flows, particularly for geographically proximate economies with strong economic ties (Tinbergen, 1962; Anderson & van Wincoop, 2003). The positive coefficient suggests that increased trade with partner states such as Kenya and Tanzania has expanded Uganda's market access and stimulated export-led activity, reinforcing the trade-creation effects theorized in the gravity literature. Likewise, within the Solow Growth Model framework, the expansion of trade enhances capital

accumulation and facilitates the import of higher-quality intermediate goods, thereby raising productivity and contributing to long-run output growth (Solow, 1956). This theoretical linkage demonstrates that the observed long-run impact of trade is not merely statistical, it aligns with established economic models predicting that regional integration fosters deeper market efficiency and greater productive capacity.

Table 4.19: Effect of intra-EAC trade on Uganda's economic growth

Cointegrating Eq:	**CointEq1**
LGDPGR(-1)	1
LTRADE(-1)	0.458*** (-0.125) [3.658]
EAC(-1)	-0.559*** (-0.209) [-2.674]
C	-10.759
Error Correction:	**D(LGDPGR)**
CointEq1	-1.045 ***(-0.259) [-4.036]
D(LGDPGR(-1))	0.209 (-0.193) [1.082]
D(LTRADE(-1))	0.483 (-0.343) [1.409]
D(EAC(-1))	0.333 (-0.332) [1.003]
C	-0.086 (-0.067) [-1.279]
Adj. R-squared	0.440

Note: Standard errors in ( ) & t-statistics in [ ]; ***, ** & * denote significance at 1%, 5% and 10%

However, the VECM reveals a negative and significant coefficient (-0.559; t = -2.674) on the long-run EAC Customs Union dummy (EAC), suggesting that the period following the Union's establishment was associated with downward pressure on Uganda's growth. This outcome resonates with empirical literature emphasizing asymmetric gains from East African integration. Studies by BOU (2013), Kuteesa & Tumuhe (2019), and EPRC (2018) show that Uganda has persistently recorded a trade deficit with Kenya due to structural weaknesses, including a narrow export basket dominated by low-value primary commodities and limited manufacturing capacity. Moreover, serious non-tariff barriers (NTBs) such as roadblocks, slow border procedures, high transport costs, and repeated sanitary-phytosanitary restrictions have disproportionately constrained Ugandan exporters (Sawere & Cuyvers, 2018). These logistical and institutional frictions increased the effective cost of trading despite tariff liberalization, thereby muting expected gains from regional integration and weakening growth outcomes, which helps explain

the negative long-run dummy coefficient. This confirms that trade reforms alone are insufficient; complementary domestic institutional strengthening is essential.

The short-run dynamics of the VECM indicate that lagged changes in intra-EAC trade (D(LTRADE)) and the EAC dummy (D(EAC)) are statistically insignificant, suggesting that the growth effects of regional trade materialize gradually, rather than through immediate short-run channels. This mirrors empirical evidence from Musila & Sigué (2016) and Mafuso et al. (2021), which argues that the growth benefits of regional trade deepen only after countries build the requisite infrastructure, institutional quality, and industrial capacity. This interpretation aligns strongly with endogenous growth theory, which argues that the impact of increased trade on productivity and technological advancement is contingent on a country's absorptive capacity, driven by human capital and institutional robustness (Romer, 1990; Nelson & Phelps, 1966). Uganda's limited capacity to absorb technological spillovers from partner states due to skills gaps, weak standards agencies, and underdeveloped firm-level innovation systems helps explain why the short-run coefficients are insignificant despite a strong long-run trade effect. Thus, the results reinforce the theoretical proposition that trade-induced growth is mediated by domestic capabilities rather than occurring automatically.

The highly significant and negative error correction term (-1.045, t = -4.036) indicates rapid adjustment toward long-run equilibrium, implying that deviations between the actual and equilibrium growth path are corrected by more than 100% within one period. This strong adjustment confirms a stable long-run relationship and reinforces the applicability of the VECM. Empirically, similar findings across Sub-Saharan Africa show that deeper integration often yields stable long-run growth paths but requires substantial investment in trade facilitation and domestic competitiveness (Mugisha et al., 2020; Joughin, 2020). The implication for Uganda is clear: the growth potential of intra-EAC trade is significant but constrained by logistical bottlenecks, NTBs, and institutional weaknesses that undermine the gains predicted by the Gravity and Solow models. Therefore, the results validate the theory while highlighting Uganda's need to enhance transport infrastructure, streamline customs procedures, build productive capacity, and strengthen standards and regulatory institutions. These complementary reforms are essential for converting increased trade volumes into sustained, innovation-driven economic growth.

4.2.8 Residual diagnostics

The VECM residual serial correlation test results, as presented in Table 4.20, show that the LM statistic at lag 1 is 7.052 with a p-value of 0.632. Since the p-value exceeds the 5% significance threshold, the null hypothesis of no serial correlation is not rejected. This indicates that the model residuals are free from autocorrelation, suggesting that the VECM adequately captures the dynamic relationships among Uganda's economic growth, intra-EAC trade, and the EAC dummy over time. The absence of serial correlation enhances the reliability of the estimated coefficients and ensures that standard errors are unbiased, consistent with standard econometric guidelines (Gujarati & Porter, 2009; Enders, 2014).

Table 4.20: VEC Residual Serial Correlation LM Tests

Lags	LM-Stat	Prob
1	7.052	0.632

Table 4.21 reports the results of the Jarque-Bera normality tests for each VECM residual component and jointly across all residuals. All individual components exhibit p-values well above 0.05, with a joint probability of 0.390, indicating that the residuals are normally distributed. Normality of residuals is an important assumption for inference in VECM models, as it ensures the validity of t- and F-statistics used to assess the significance of short- and long-run coefficients (Hamilton, 1994; Lütkepohl, 2005).

Table 4.21: VEC Residual Normality Tests

Component	**Jarque-Bera**	**Prob***
1	1.176	0.555
2	0.309	0.857
3	2.387	0.508
Joint	0.738	0.390

The VECM residual heteroskedasticity test results, shown in Table 4.22, report a joint chi-square statistic of 25.946 with a p-value of 0.976. This high p-value implies that the null hypothesis of homoskedasticity cannot be rejected, meaning that the residual variance is constant over time. The absence of heteroskedasticity is critical for reliable coefficient estimation and hypothesis testing,

as heteroskedastic residuals can lead to inefficient estimates and biased standard errors (Wooldridge, 2013).

Table 4.22: VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)

Chi-sq	df	Prob.
25.946	42	0.976

Collectively, the diagnostic tests confirm that the VECM is well-specified, stable, and statistically robust, thereby supporting confidence in the interpretation of both short- and long-run relationships between intra-EAC trade and Uganda's economic growth.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS OF FINDINGS

5.1 Summary of findings

The study investigated the effect of the East African Community (EAC) Customs Union on Uganda's trade performance and economic growth, employing Vector Error Correction Model (VECM) to capture short- and long-term dynamics. The study found that Uganda's trade performance with EAC partners improved after the establishment of the Customs Union in 2005, with descriptive statistics showing high and steadily increasing trade volumes. Correlation analysis indicated strong positive relationships between trade and total EAC GDP, as well as between trade and the EAC dummy variable, supporting the expectation that regional integration stimulates cross-border trade. However, regression results from the VECM revealed that while total EAC GDP significantly influences Uganda's trade, the long-run effect of the Customs Union dummy was not statistically significant, suggesting that tariff elimination alone did not substantially alter Uganda's trade structure. These findings highlight that Uganda's trade response is constrained by structural factors, including a narrow export base and reliance on low-value commodities.

The VECM short-run results demonstrate that Uganda's trade flows adjust dynamically to changes in regional economic activity. The negative and significant error correction coefficient (-0.727) indicates that deviations from long-run equilibrium are corrected relatively quickly. Positive short-run effects of past changes in trade and total EAC GDP suggest temporary improvements in trade performance following economic shifts in the region. Nevertheless, the modest short-run coefficients reflect the importance of endogenous factors, such as technology adoption, firm learning, and human capital development, in fully realizing the benefits of trade integration. These results confirm that Uganda responds to regional economic signals, but structural constraints limit the translation of trade liberalization into sustained long-term gains.

Regarding the second objective, the VECM analysis shows that intra-EAC trade has a positive and significant long-run effect on Uganda's economic growth, with increased trade volumes enhancing market access, productivity, and export-led activity. However, the EAC Customs Union dummy exhibits a negative long-run effect on growth, reflecting asymmetric gains from integration and persistent trade deficits with larger partners such as Kenya. Short-run coefficients are largely

insignificant, indicating that growth benefits from regional trade materialize gradually. The significant and negative error correction term (-1.045) confirms rapid adjustment toward long-run equilibrium, highlighting a stable long-run relationship between trade and growth consistent with the Gravity Model and Solow Growth framework.

Residual diagnostics confirm that the VECM is well-specified and statistically robust, with no evidence of serial correlation, heteroskedasticity, or non-normality of residuals. These results validate the reliability of the estimated long- and short-run coefficients. The findings imply that while intra-EAC trade can foster sustainable economic growth, the benefits of the Customs Union are moderated by structural and institutional constraints, including logistical bottlenecks, non-tariff barriers, and limited domestic manufacturing capacity.

5.2 Conclusion

In conclusion, this study provides clear empirical evidence to address its core objectives and test its stated hypotheses. Regarding the first objective, the findings indicate that the EAC Customs Union has not had a statistically significant long-run effect on Uganda's trade performance. Consequently, the first hypothesis, which stated that "The East African Community Customs Union has no significant effect on Uganda's trade performance," is not rejected. This result highlights that while trade volumes have increased, this growth is more attributable to the general economic expansion of the region than to the specific policy shock of tariff elimination. The persistent influence of non-tariff barriers, logistical bottlenecks, and Uganda's narrow export base have effectively muted the Customs Union's direct impact, preventing it from being a decisive factor in enhancing trade performance.

Pertaining to the second objective, the analysis reveals a strong and positive long-run relationship between intra-EAC trade and Uganda's economic growth. This leads to the rejection of the second hypothesis, which posited that "Intra-EAC trade has no significant effect on economic growth in Uganda." The results confirm that trade within the bloc is a genuine driver of economic expansion for Uganda, facilitating market access, economies of scale, and productivity gains. However, this positive outcome exists alongside the paradoxical finding that the Customs Union period itself is associated with negative growth pressures, highlighting a disconnect between the policy and its

intended outcome. The growth benefits are realized through the trade flows themselves, not directly through the policy instrument that was designed to create them.

Therefore, the study concludes that the EAC Customs Union's contribution to Uganda's economic growth is indirect and conditional. The primary channel for growth is intra-EAC trade, but the Customs Union has been an insufficient catalyst for optimizing this trade. Therefore, recommendations must be targeted and specific.

5.3 Policy Recommendations

Based on the study results, the following policy recommendation are proposed;

Launch a national time-bound program for the elimination of persistent non-tariff barriers (NTBs)

- **Action:** The Ministry of Trade, Industry and Cooperatives (MoTIC), in collaboration with the EAC Secretariat, should establish and publicly champion a digital, real-time NTB reporting and resolution platform. This system should mandate that any complaint filed by a trader must be acknowledged within 48 hours and resolved within a maximum of 30 days.
- **Responsible Institutions:** Ministry of Trade, Industry and Cooperatives (MoTIC) (Lead), Uganda Revenue Authority (URA), Uganda National Bureau of Standards (UNBS), EAC Secretariat.
- **Timeline:** Platform launch within 12 months; full operationalization and public awareness campaign within 18 months.

Accelerate the modernization and efficiency of key northern and central transport corridors

- **Action:** The Ministry of Works and Transport should prioritize and fast-track the public-private partnership (PPP) for the Electronic Cargo Tracking System (ECTS) on the Northern and Central Corridors. Concurrently, implement a mandatory "Single Customs Territory" window at major border posts like Malaba and Mirama Hills, integrating all agencies (URA, UNBS, security) into one stop to reduce clearance times from days to hours.
- **Responsible Institutions:** Ministry of Works and Transport (Lead), Uganda Revenue Authority (URA), Private Sector Foundation Uganda (PSFU).

- **Timeline:** ECTS operational within 18 months; full implementation of the integrated border post model at two key borders within 24 months.

Implement a targeted export diversification fund for high-potential value chains

- **Action:** The Ministry of Finance, Planning and Economic Development (MoFPED), in partnership with the Uganda Development Bank (UDB), should create a dedicated credit facility with concessional interest rates for Small and Medium Enterprises (SMEs) in agro-processing, light manufacturing, and horticulture. The fund should specifically support the acquisition of machinery for value-addition (e.g., fruit pulping, coffee roasting, dairy processing) and market penetration activities targeting EAC partner states.
- **Responsible Institutions:** Ministry of Finance, Planning and Economic Development (MoFPED) (Lead), Uganda Development Bank (UDB), Ministry of Agriculture, Animal Industry and Fisheries (MAAIF).
- **Timeline:** Fund established and operational within 12 months; first disbursements to qualifying enterprises within 18 months.

Enforce mandatory harmonization of standards and mutual recognition agreements

- **Action:** The Uganda National Bureau of Standards (UNBS) must proactively adopt and enforce all EAC-harmonized standards, particularly for processed foods, cosmetics, and building materials. Furthermore, MoTIC and UNBS should lead bilateral negotiations with Kenya and Tanzania to finalize and implement Mutual Recognition Agreements (MRAs) for product certification, so that goods certified in Uganda are automatically accepted in partner states without retesting.
- **Responsible Institutions:** Uganda National Bureau of Standards (UNBS) (Lead), Ministry of Trade, Industry and Cooperatives (MoTIC).
- **Timeline:** Full adoption of priority EAC standards within 12 months; at least two key MRAs signed and operational within 24 months.

Establish a national trade facilitation committee with private sector enforcement power

- **Action:** Elevate the existing National Trade Facilitation Committee to a statutory body chaired by the Prime Minister, with mandatory, quarterly reporting to Parliament. This committee must include strong, voting representation from private sector associations like

PSFU and the Uganda Manufacturers Association (UMA). Its mandate will be to monitor the implementation of the above recommendations and hold all government agencies accountable for meeting the set deadlines.

- **Responsible Institutions:** Office of the Prime Minister (Chair), Private Sector Foundation Uganda (PSFU), Uganda Manufacturers Association (UMA), all relevant Ministries and Agencies.
- **Timeline:** Committee formally constituted and holding its first quarterly meeting within 6 months.

5.4 Areas for further research

Sectoral analysis of intra-EAC trade impact: Future research could investigate how intra-EAC trade affects specific sectors of the Ugandan economy, such as agriculture, manufacturing, or services. This would help identify which sectors benefit most from the Customs Union and which face structural constraints. Such sector-level studies could guide targeted policy interventions to enhance sectoral competitiveness and export diversification.

Firm-level studies on trade and productivity: Further studies could examine the impact of regional integration on firm performance, productivity, and technology adoption. Micro-level data on SMEs and large enterprises would provide insights into how different types of firms respond to tariff elimination, NTBs, and market access, revealing mechanisms through which trade translates into growth.

Non-tariff barriers and border efficiency: Given that NTBs were identified as key constraints, future research could focus on quantifying the economic cost of NTBs and evaluating the effectiveness of digital customs and border facilitation initiatives. This could include firm surveys or border transaction data to assess how procedural inefficiencies impact trade volumes and growth outcomes.

Impact of infrastructure investments on trade and growth: Future research could explore the role of transport, logistics, and storage infrastructure in mediating the effects of the EAC Customs Union on Uganda's economic growth. Studies could use a combination of spatial data, trade flows,

and firm-level performance metrics to assess the effectiveness of infrastructure improvements in enhancing market access.

Role of institutional and regulatory quality: Further studies could investigate how institutional capacity, governance, and regulatory quality affect Uganda's ability to leverage intra-EAC trade for economic growth. Comparative studies across EAC member states or within different regulatory domains (e.g., standards, certification, customs enforcement) would provide actionable insights for strengthening domestic institutions and improving trade outcomes.

5.5 Limitation of the study

This study's empirical approach, while robust, is subject to several limitations inherent in its methodological choices and data constraints. Firstly, the reliance on aggregate, macro-level data presents a significant constraint. The use of total trade volume and GDP growth, though necessary for a macroeconomic analysis, obscures critical underlying dynamics. These aggregates mask the heterogeneous performance of specific sectors and product categories, which contribute differently to economic growth. For instance, the export of high-value manufactured goods likely has a more substantial growth multiplier effect than the export of unprocessed raw materials, a distinction lost in the aggregated figures.

Secondly, the modeling framework itself, though appropriate, has inherent limitations. The Vector Error Correction Model (VECM) effectively captures long-run equilibrium relationships but is less adept at isolating the impact of short-term, exogenous shocks. The study's structural break test was solely focused on the 2005 Customs Union, thereby overlooking the potential influence of other major events during the 1994–2024 period. Significant external shocks such as the global financial crisis of 2008–2009, volatile international oil prices, the COVID-19 pandemic's disruption to global supply chains, and regional political events likely had profound, yet unmeasured, effects on Uganda's trade performance and economic growth that are not accounted for in the model.

Furthermore, the proxy for regional integration - the EAC Customs Union dummy variable is a blunt instrument. It captures the de jure implementation of the policy in 2005 but fails to measure the de facto intensity or quality of integration over time. This variable does not reflect the evolving

nature of trade facilitation, the persistence of non-tariff barriers (NTBs), or the gradual deepening of supply chain linkages. Consequently, the model may underestimate the cumulative effects of integration. Lastly, while steps were taken to mitigate multicollinearity, the use of highly correlated macroeconomic variables and the assumption of linear relationships in the initial OLS estimations may not fully capture the complex, dynamic, and potentially non-linear interactions between trade and growth.

These limitations collectively suggest that while the findings provide valuable insights into the broad relationship between the EAC Customs Union and Uganda's economy, they should be interpreted as indicative of general trends rather than precise causal estimates. Future research would benefit immensely from employing disaggregated sectoral data, developing more nuanced indices for regional integration, and incorporating control variables for major external shocks to build a more resilient and detailed understanding of these critical economic relationships.

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