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**Book**

# Leveraging the AfCFTA Agreement for Uganda's export growth : challenges and solutions

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EPRC
ECONOMIC POLICY RESEARCH CENTRE

# Leveraging the AfCFTA Agreement for Uganda's Export Growth:

## Challenges and Solutions.


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## ABSTRACT

This paper analyses avenues through which Uganda can benefit from the African Continental Free Trade Agreement (AfCFTA) for export growth by addressing the underlying challenges. Using mixed method approaches and a Gravity flow model on panel data (2011-2020), we identify the key challenges that Uganda should address to harness the most out of the AfCFTA. Results suggest that logistics and transport infrastructure, such as ports, railways, waterways, and logistics services, for instance, warehouses, distribution centres, customs, etc., play a significant role in determining the level of exports. Population increase and GDP growth significantly influence Uganda's exports. While longer distance between Uganda and her trading partners in Africa reduce trade flows. Developing the logistics industry nationally and continentally is imperative to boost intra-African trade. Africa should improve transport networks and connectivity to increase market access for Uganda and other State Parties. Other critical areas include strengthening the dispute resolution mechanisms and legal frameworks to reduce non-tariff barriers. State parties should use diplomatic solutions to conflicts, increase access to information, foster innovation, harmonise standards and strengthen national conformity assessment regimes to deepen intra-African trade.

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# 1. INTRODUCTION

## 1.1 Background

Over the past half-century, international trade has grown rapidly, with the value of global exports surpassing $33 trillion in 2024 from $296 billion in 1950 (UNCTAD, 2024). Similarly, the share of global exports in GDP increased significantly, rising from 8 percent in 1950 to over 25 percent by 2014 (Ortiz-Ospina, Beltekian, & Roser, 2018). The rapid increase in global trade was enabled by a significant reduction in global import tariffs from 8.6 percent in 1960 to about 3.2 percent in 1995 (Baier and Bergstrand, 2001).

Yet, despite the rapid increase in global trade, intra-African trade is still very low accounting for a small share of total trade, estimated at 15 percent of total African trade, compared to 67 percent in Europe, 44 percent in America, and 63 percent in Asia (UNCTAD, 2022; Kassa, Edjigu, & Zeufack, 2022). Uganda accounts for only 1.9 percent of intra-African trade (Kassa, Edjigu, & Zeufack, 2022). The low share of intra-African trade is attributed to several challenges including high transaction and trade costs (TTCs), limited market access, weak market integration, inadequate and poor trade facilitation infrastructure, and weak productive capacity, among other challenges (Saygili, Peters, & Knebel, 2018; Mevel & Karingi, 2012; Iwanow, & Kirkpatrick, 2009; Longo & Sekkat, 2004).

The African Heads of State signed the Agreement establishing the Africa Continental Free Trade Area (AfCFTA), along with three Protocols on trade in goods, services, and dispute settlement, and the Annexes to the Protocols, on March 21st, 2018 in Kigali, Rwanda. The objectives and guiding principles for AfCFTA negotiations and the modalities for liberalising trade in services were also adopted by the Agreement. The AfCFTA was built on the eight Regional Economic Communities (RECs)[1]. The AfCFTA Agreement which came into force on 30th May 2019, is a monumental step in the continent's economic integration process. The eight Regional Economic Communities (RECs) formed the foundation of the AfCFTA Agreement. According to the UN Economic Commission for Africa (ECA) (2018), the AfCFTA will boost intra-African trade by 52 percent by 2035, reduce import duties by 90 percent, and increase trade after the elimination of non-tariff barriers (NTBs). Furthermore, the AfCFTA will create a single continental market for goods and services, allowing the free movement of businesspersons and investments and enabling the creation of the Continental Customs Union (CU).

The creation of the AfCFTA presents an immense and unique opportunity for Africa in general and Uganda in particular to boost growth, generate employment, reduce poverty, and mitigate overdependence on commodity trade characterised by price instability (World Bank, 2020). The 2020 World Bank report further estimates that the AfCFTA has the potential to raise income in Africa by 7 percent by 2035 and lift 40 million people out of extreme poverty out of approximately 1.3 billion people, mainly by spurring intra-regional trade. This potential for significant income gains and poverty reduction underscores the transformative impact of the AfCFTA. A decrease in NTBs on goods and services and improvements in trade facilitation measures will account for about 67 percent of the estimated USD 450 billion in potential income gains,

1 Economic Community of Central African States *(ECCAS), Economic Community of West African States (ECOWAS),* Southern African Development Community *(SADC), Arab Maghreb Union (AMU), Community of Sahel–Saharan States (CEN-SAD), Intergovernmental Authority on Development (IGAD), Common Market for East and Southern Africa (COMESA) and the East African Community (EAC).*

contributing to a more robust and dynamic African economy.

There are also potential significant gains from foreign direct investment (FDI) flows under the AfCFTA from cross-border investment. Lowering barriers to entry and harmonising regulations across countries will encourage more cross-border investment, further boosting real income gains in Africa to about 8 percent in 2035 due to elimination of tariffs and NTBs and the pursuit of a single, unified market (World Bank, 2020). This is partially because investors in each of the 54 member countries will have access to a market of 1.3 billion people and a combined GDP of USD 3.4 trillion. Integration into global and regional value chains is also expected to increase the likelihood of FDI flows, resulting in investment, job creation, and the expertise FDI provides. (Echandi et al., 2022).

Embedding export trade in the continental value chain will significantly change sectoral trade patterns and output. Sectors identified include exports of textiles and apparel, chemical, rubber, and plastic products, and processed foods. Reduced trade costs will significantly boost exports of transport services, processed foods, wood and paper products, chemicals, rubber and plastic products, and petroleum and coal products. An additional increase in exports will also a raise from the increase in FDI inflows in capital-intensive sectors such as energy-intensive manufactures, fossil fuels, and communication services. This potential for increased FDI in capital-intensive sectors underscores significant growth and development potential. The increase in FDI will lead to a more significant expansion of the output of construction, energy-intensive manufacturing, communication services, and insurance services. Relatedly, several service sectors will expand with increased FDI in air transport and hospitality, offering hope for a brighter future.

## 1.2 Potential Benefits for Uganda

The AfCFTA provides immense opportunities for Uganda to achieve its export-oriented growth strategy. The potential benefits of the AfCFTA for Uganda derive from the Agreement provisions and measures that seek to expand the continental market, as well as FDI flows, among others. (Echandi *et al.,* 2022). The more immense market opportunities will trigger more trade and investment and allow greater value addition, export diversification, and productivity growth, leading to better quality jobs and greater social inclusion. We expect the AfCFTA agreement's FDI inflows to generate more jobs, attract expertise, build local capacity, and forge connections that will help Ugandan companies join regional and global value chains. The AfCFTA will enhance the application of transparent, precise, enforceable rules and disciplines to potentially increase the credibility and predictability of administrative actions in FDI. The AfCFTA will also enhance trade and investment competitiveness, promote industrial development through diversification and regional value chain development, and foster sustainable socio-economic development and structural transformation. Thus, Uganda will benefit from increased intra-African trade under the AfCFTA Agreement in the five priority sectors—business, communication, finance, transport, and tourism.

The AfCFTA provision for increased movement of persons will promote tourism, a major foreign exchange earner and employer, providing an opportunity for Ugandans to boost the tourism value chain. Uganda has a reasonable capacity to offer different products: culture and heritage sites, religious events, education and sports, Meetings, Incentives, Conferences and Events (MICE), specialised health care services, plus nature and wildlife. Uganda's participation in the AfCFTA agreement is

anticipated to contribute significantly to poverty reduction through the development of value chains, trade, and industrialisation. Uganda's agricultural sector employs (90 percent) of the population directly and indirectly. The AfCFTA agreement promises higher intra-regional trade in agri-food products. Uganda's agriculture sector has the potential to generate surplus and export the same to deficit countries if exploited. This will contribute to stabilising food prices, improving food security in Africa, and guaranteeing Uganda increased export revenues.

Uganda's population is comprised mainly of youth and women, characterised by a high youth and women mainly involved in the informal sector. Evidence suggests that intra-regional trade through the AfCTFA has the potential to reduce the burgeoning Africa's youth unemployment (Anyanwu, 2014). Given that the agreement seeks to promote inclusive socio-economic development, gender equality and structural transformation of the State Parties, empowering women and the youth will significantly contribute to poverty reduction and bring prosperity to households (UNDP, 2020). Finally, the agreement addresses micro, small, and medium-sized enterprises. Considering this, the State Parties of AfCFTA are mandated to improve the export capacity of both formal and informal service suppliers, with particular attention paid to enterprises owned by women and youth. Bringing them into the policy limelight will make a significant contribution.

Uganda has actively participated in some Regional Economic Communities (RECs), such as the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA). The large market size of the AfCFTA should create more export opportunities and accelerate industrialization. The National Planning Authority (NPA) projects that the AfCFTA will increase EAC trade to about USD 737 million (a 13 percent export increase) and will promote industrial development through diversification and regional value chain development.

In conclusion, the AfCFTA Agreement provides immense opportunities for Uganda via trade and investments in goods and services in line with the National Vision 2040[2]. However, these envisioned development opportunities will involve adjustment costs, risks, and challenges that we must identify and address. Uganda has implemented several measures, frameworks, and policies to promote exports. Notwithstanding, there are persistent bottlenecks which should be assessed and addressed regarding the AfCFTA market access. These have the capacity and potential to hamper the country's ability to take full advantage of the opportunities to trade and its effective participation in continental markets as it opens its domestic market to the continent.

## 1.3 Purpose and objectives of the study

To fully realise its transformational impact, the AfCFTA must increase and expand export opportunities, prioritise job creation and expand opportunities to support the economic participation of all sectors of the economy. This offers tremendous potential to drive the economic transition from agricultural and extractive activities to more innovative and value-added industrial sectors. Unlocking these potential gains in trade, investment, and jobs will not be straightforward. It will require increasing private sector participation and generating greater grassroots support for the AfCFTA, going beyond government leadership. To achieve optimal results, we must deliberately identify the challenges and risks and take steps to mitigate them. Reducing

2 "Transforming the Ugandan society from a peasant to a modern and prosperous society

and eliminating tariffs under the AfCFTA Agreement is a necessary but insufficient for Uganda to benefit from the agreement mutually and optimally. Challenges include meeting quality standards, reducing NTBs, poor logistics, Technical Barriers to Trade (TBTs), infrastructure deficits, trade facilitation inadequacies, fragile states in the neighbourhood and import surges, among others.

Thus, the extent to which these enhance or impede Uganda's trade with State Parties under AfCTFA needs to be established to offer appropriate policy measures and actions. Specifically, the study sought to:

a) Establish the extent to which enhancers and impediments determine Uganda's potential export trade benefits under the AfCFTA Agreement; and
b) To identify viable market penetration strategies to increase Uganda's export market share under the AfCFTA Agreement.

# 2 RELATED LITERATURE

## 2.1 Theoretical Literature

Conventional models of RECs heavily rely on the theories of Free Trade Agreements (FTAs) and customs union (CU) proposed by (Viner, 1950). Viner's concept of CU suggests an arrangement to reduce tariff barriers between political units while maintaining barriers against imports from outside regions. Therefore, economic integration implies a system of custom discrimination among nations since the imports of the same product are subject to diverse tariffs and barriers depending on whether the country of origin belongs to the group of integration. Viner demonstrated that the effects of CUs can be positive or negative. In his analysis, Viner (1950) introduced the concepts of 'trade creation' and 'trade diversion' that are essential in understanding of the effects of economic integration. Trade diversion is the shift from less expensive to more expensive producers, while trade creation is the increment in the trade volume among countries when they agree to establish an FTA. This typically means changing from more expensive to less expensive producers.

When FTA leads to trade diversion, countries are worse off, while trade creation increases economic welfare. Daniela Filip (2017) argues that the probability of having trade creation is higher than trade diversion, but this depends on several factors. The higher the elasticity of demand and supply of a country that wants to participate in an FTA, the greater the trade creation. In addition, the higher the previous tariff among countries establishing the FTA, the higher the trade creation. The trade creation benefits are superior when the union is between two rival economies. The trade diversion will be lower when the external tariff imposed on third countries by the FTA is low.

If FTA members hike external tariffs, the impact of trade diversion will be more substantial because high external tariffs will exacerbate trade diversion (Freund and Ornelas, 2010). An essential gain from regional free trade agreements arises from increased size and, hence, productive efficiency and competitiveness of markets subject to economies of scale (Krugman, 1991). Arguably, the most critical gains from FTA are the dynamic gains, according to Baldwin (1992), associated with the benefits from competition, FDIs, economies of scale, transfer of knowledge and technology, increased productivity, and economic diversification.

However, the conventional framework adopted in the analysis is based on static gains from trade and ignores the possibility of long-term dynamic effects of trade identified by (Balassa, 1961; Cooper and Massel, 1965). Moreover, the conventional analysis of the gains from FTAs and CU is based exclusively on production effects. It ignores the consumption effects associated with consumer surpluses arising from price reductions, as shown by (Lipsey, 1965). The classical model of FTA and CU also ignores the trade efficiency gains from the competition and benefits that accrue from the removal of trade barriers, technology transfer, investment flows, efficient allocation of resources, and income distribution as postulated by (Baldwin & Venables, 1995; Caporaso, 1998). The consensus is that the gains from RECs and FTAs are significantly better in practice than in theory (Krugman, 1991; Bergsten, 1991). Practical evidence shows that FTAs and RECs have large positive and significant effects.

Despite the overwhelming benefits of FTAs in practice, there are key challenges that impede RECs from realising these benefits. Among the most pressing obstacles is the prevalence of NTBs, which limits these gains. Others include multiple overlapping REC memberships, geographic and political fragmentation and thick borders—all of which increase the cost of moving goods across borders. Thick borders also lead to delays in the movement of goods, increasing transaction costs. Underdeveloped physical infrastructure and high transaction costs – further lead to unnecessary delays.

## 2.2 Empirical literature

Mevel and Karingi (2012) using a Computable General Equilibrium (CGE) model to analyse scenarios of African countries trade with and without tariffs and the effect of establishing a Continental Free Trade Area (CFTA) and a Continental Customs Union (CCU) in Africa. They find that establishing a CFTA would significantly contribute to increasing trade and its sophistication within the African continent. However, the removal of tariff barriers alone would not be sufficient to double the share of intra-African trade as envisaged due to existence of large NTBs.

In a survey of recent literature, studies by (Redding 2016; Redding & Turner, 2015; Martincus & Blyde, 2013; Duranton, Morrow, & Turner, 2014) have shown that good quality transport infrastructure, especially roads, boosts trade by lowering transportation costs and facilitating the distribution and mobility of products and people. Using road quality index and interstate highways, they find that good quality roads boost exports by lowering transportation costs, reducing trading costs and time, which boost exports.

However, there is evidence pointing towards trade facilitation gaps, suggesting maritime transport is the main conduit for African trade. According to Mataba and Ismail (2021) maritime transport supports 90 percent of the continent's trade. Therefore, port delays are particularly detrimental for landlocked countries. For instance, before the pandemic, the average length of acquiring shipping and customs documents was 228 hours for a container carrying citrus exports from South Africa (ibid). A day's delay in the border processes is estimated to be associated with a 1 percent decline in trade (Hoekman & Njinkeu 2017; WTO, i.n.d). Lengthy port delays limit connectivity of intra-Africa markets and supply chains.

The efficiency of trade and logistic support transport infrastructure such as ports, railways, waterways, and logistics services, for instance, warehouses, distribution centres, customs, etc., have been shown to facilitate the smooth flow and mobility of goods, which increases cross-border exports (Gani, 2017; Martí, Puertas, & García,

2014; Hausman, Lee, & Subramanian, 2013). Several recent studies, including Gani (2017), Puertas et al. (2014), Martí et al. (2014) and Hausman et al. (2013), using overall logistics performance[3] find that the overall quality of logistics performance enhances global bilateral trade and export competitiveness by lowering trade costs and trading time, which boosts exports and imports. Despite the significant role of logistics infrastructure and services, for example, the efficiency of the customs clearance process in promoting exports, Uganda's logistics performance index is still weak. According to Foster (2010) 30 percent of Africa's infrastructure including 40 percent of roads stock require rehabilitation. For landlocked countries, the added cost of poor infrastructure was 60 percent (Fofack, 2020).

According to recent studies by (Raballand, 2012; Teravaninthorn & Raballand, 2009; Kumar & Barrett, 2008), inefficiencies in logistics performance, for instance, poor road networks, traffic jams, transport prices and costs, hinder intra-African trade by increasing trade costs and time to import and export. While Uganda's LPI is slightly above the African average, it is still poor compared to North America, Europe, Asia, and the Middle East.

Although documentation shows improved logistics infrastructure quality boosts exports and trade competitiveness, studies reveal a negative correlation between LPI and trade. For instance, Hollweg and Wong (2009), using a logistics regulatory restrictiveness index, found a negative link between LPI and better logistics scores, particularly in the Association of Southeast Asian Nations. Thus, there is a need for the government to improve the quality of LP to boost intra-African trade, especially in areas of tracking and tracing consignments, efficiency in the customs clearance process, and trade and transport-related infrastructure.

Similarly, Abrego *et al. (2019) find that excessive prevalence of NTBs on the African continent poses* a significant challenge for intra-Africa trade. Their calculations show that the ad valorem equivalent or additional costs due to Uganda's NTMs amounted to a very high percentage. Whereas Uganda's was estimated at 310 percent, Tanzania's was 250 percent, and Rwanda's was close to 400 percent. Further analysis of 2018 WTO data of non-tariff trade measures, such as technical barriers to trade, reveals that Uganda had 999 TBTs in place, the highest in the EAC, compared to 777 measures in Kenya, Rwanda, 215; Tanzania, 292 and Burundi 13 (ibid).

# 3 METHODOLOGY

This study adopts a mixed-methods approach involving quantitative and qualitative analysis.

## 3.1 Gravity model estimation

The study employed the gravity model to estimate how the enhancers' support and impediments negatively impact Uganda's potential export trade benefits under the AfCFTA Agreement. The work of Tinbergen (1962) and Pöyhönen (1963), who pioneered the gravity models widely used in international trade literature, gravity as recently updated by Anderson & Van Wincoop (2004), the study used the gravity model to estimate this. The model's ability to correctly approximate bilateral trade flows make it one of the most successful empirical undertakings in economics.

In its simplest form, the gravity equation

3 Which measures the: "ability to track and trace consignments (LP-C); competence and quality of logistics services (LP-S); efficiency of customs clearance process (LP-CC); frequency with which shipments reach consignee within scheduled or expected time (LP-F); and quality of trade and transport-related infrastructure (LP-I)"

states that the trade flows from country *i* (Uganda) to country *j* (other AfCFTA State Parties) is proportional to the product of the two countries' GDPs, denoted by $Y_i$ and $Y_j$, and inversely proportional to their distance, *Dij*, broadly construed to include all factors that might create trade resistance as specified in *equation 1*.

$$X_{ij} = \alpha 0 Y_i^{\alpha 1} Y j^{\alpha 2} D ij^{\alpha 3}, \quad 1$$

Where α0, α1, α2, and α3 are parameters to be estimated. This relationship in *Equation 1* is log-linearized, and parameters are estimated in its short form as in *Equation 2*

$$lnX_{ij} = ln(a_0) + a_1 ln(Y_i) + a_2 ln(Y_j) + a_3 ln(D_{ij}) + e_{tij} \quad 2$$

## 3.2 Poisson Pseudo Maximum Likelihood (PPML) Estimation Technique

This study adopted the Poisson Pseudo Maximum Likelihood (PPML) estimator by (Santos Silva and Tenreyro 2006; Silva & Tenreyro, 2011). The PPML estimator was chosen based on several grounds. One of the most recognised problems when estimating gravity models is the presence of nonnegative trade flows and heteroscedasticity. Therefore, to deal with zero trade flows and heteroscedasticity, which can produce biased results, the Poisson Pseudo Maximum Likelihood (PPML) approach was adopted because it produces robust outcomes (Silva & Tenreyro, 2006, 2011).

Firstly, the PPML, being a non-linear estimator, is able to account for zero trade flows in the model. A notable drawback of the OLS approach is that it does not account for zero values in bilateral trade flows or consider the information with zero trade values. Secondly, the PPML estimator accounts for heteroscedasticity, which characterise international trade data (Santos Silva and Tenreyro, 2006). With heteroscedasticity, estimating gravity models with the OLS estimator results in biased and inconsistent estimates. Thirdly, due to the additive property of the PPML estimator, the gravity-fixed effects are kept identical to their corresponding structural terms (Arvis and Shepherd, 2013; Fally, 2015). Finally, the PPML estimator can approximate trade-related policies' general equilibrium effects (Anderson *et al.,* 2015).

PPML assumes conditional variance as proportional to the conditional mean. The model estimated under PPML is as follows.

$$X_{ijt} = \beta_o + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln POP_{it} + \beta_4 \ln POP_{jt} + \beta_5 \ln DIS_{ij} + \beta_6 Cont_{ij} + \beta_7 Comm\ Lang_{ij} + \beta_8 Comm\ col_{it} + \beta_9 LPI_{it} + \beta_{10} LPI_{jt} + \beta_{11}\delta_{it} + \beta_{12}\delta_{ij} + \beta_{13} ln\ Avail\ Tech_{it} + \beta_{14} ln\ Avail\ Tech_{jt} + \beta_{15} ln\ Inno_{it} + \beta_{16} ln\ Inno_{jt} + \beta_{17} In\ Tech\ readiness_{it} + \beta_{18} InTech\ readiness_{jt} + \beta_{19} In\ Internet\ use_{it} + \beta_{20} In\ Internet\ use_{jt} + \varepsilon_{ijt} \quad (3)$$

Where *i* indexes the exporter country (Uganda), *j* importer country (State Parties), and *t* time. The dependent variable *(* represents the value of Uganda's exports to the AfCFTA State Parties at a given time (t). Two groups of explanatory variables are included as determinants of trade. The first includes standard gravity variables: $Y_{it}$ and $Y_{jt}$ indicate, respectively, the production of the exporter and expenditure consumption of the importer; *Distance* is the distance between country *i* and *j*; contingency, common language and common colony are dummy variables taking the value of 1 for pair of countries sharing, respectively, common border, common language, and common colony and zero otherwise. The second set of variables is included to test our main hypothesis that costs, logistic performance (LPI), availability of latest technology (AvailTechijt), technological readiness, Innovation, among other factors, negatively and positively impacts Uganda's

export trade to the State Parties.

The PPML model generates estimates of Xijt instead of lnXijt. Hence, the problem of underestimating large trade flows and total trade volume is avoided (Burger et al., 2009). Furthermore, the estimation of PPML using the maximum likelihood technique adapts the estimates to the actual data, implying that the sum of the predicted values is virtually identical to the sum of the input values.

The PPML is consistent in the presence of heteroscedasticity and with null values of the dependent variable. Estimates based on Poisson probability are consistent even if the data do not follow a Poisson distribution. Therefore, the PPML has the advantage of being convergent in heteroscedasticity and dealing robustly with the problem of the high concentration of zero values in the dependent variable.

## 3.4 Data sources

This study used data from different sources. These include Centre d'Études Prospectives et d'Informations Internationales (CEPII), World Development Indicators (WDI), World Global Competitiveness Report (WGCR), Logistic Performance Index (LPI), and International, Trademap. We first present defination of the key variables and indicators used in the estimated gravity model. The indicators are compared across Uganda, Africa, and other continents. We then estimate a gravity model to establish Uganda's challenges in increasing exports to the AfCFTA. Finally, we present key issues from the Key Informant Interviews to identify the obstacles Uganda will likely face in exporting to the AfCFTA.

**Table 1: Variable description, data source and expected sign**

| Variable | Description | Source | Expected sign |
|---|---|---|---|
| Export | Value of exports to the 54 African countries | ITC | N/A |
| GDP_i: | Exporter's GDP, PPP (current international $) | WDI | + |
| GDPj: | Importer's GDP, PPP (current international $) | WDI | + |
| Distance | Distances between the cities in trading partner | CEPII | _ |
| Contingency | Dummy variable = 1 if the trading partners share a common border, 0 otherwise | CEPII | + |
| Common colony | Dummy variable = 1 if the trading partners share the same colony. | CEPII | + |
| Common language | Dummy variable = 1 if the trading partners share the same official language, 0 otherwise | CEPII | + |
| Population i | Population of the Exporter Country | WDI | -/ + |
| Population j | Population of the importing country | WDI | -/ + |
| Railway (i & j) | It's an index of railway quality measured from 1 to 7 [1 = extremely underdeveloped—among the worst in the world; 7 = extensive and efficient—among the best in the world]. | WGCR | + |
| Road (i & j) | It's an index of road quality measured from 1 to 7 [1 = extremely underdeveloped—among the worst in the world; 7 = extensive and efficient—among the best in the world]. | WGCR | + |

| Variable | Description | Source | Expected sign |
|---|---|---|---|
| Water/port (i & j) | It's an index of the quality port measured from 1 to 7 [1 = extremely underdeveloped—among the worst in the world; 7 = extensive and efficient—among the best in the world]. | WGCR | + |
| Air (i & j) | It's an index of air quality measured from 1 to 7 [1 = extremely underdeveloped—among the worst in the world; 7 = extensive and efficient—among the best in the world]. | WGCR | + |
| Logistic Performance Index (i & j) | It measures the speed of trade with indicators derived from large datasets tracking shipments. It is measured from [1= low to 5= high]. | LPI Report | + |
| Technological readiness (i & j) | The technological readiness pillar measures the agility with which an economy adopts existing technologies to enhance the productivity of its industries. | WGCR | + |
| Internet usage (i&j) | Measures how long users spend on the Internet as part of normal day-to-day activities | WGCR | + |
| Capacity of innovation (i & j) | It measures how economies approach the frontiers of knowledge, and the possibility of generating more value by merely integrating and adapting exogenous technologies tends to disappear. | WGCR | + |

# 4 FINDINGS

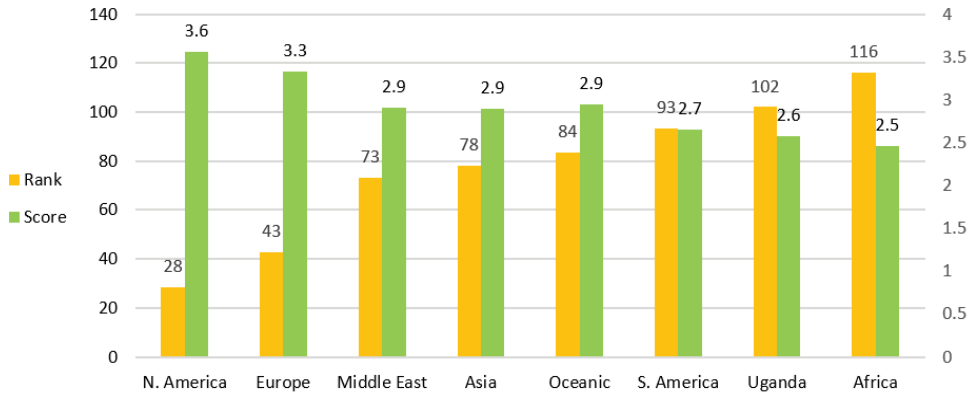
This section presents the paper's results and discussions. It starts by presenting and discussing the key logistics indicators. This is followed by presenting the Gravity model estimation results and emerging issues from the KIIs.

## 4.1 Discussion of Key Logistics Indicators

### Logistics Performance Index (LPI)

The Logistics Performance Index (LPI) measures countries' logistics performance concerning trade. It indicates the efficiency levels of a country's logistics. As a compound indicator, it takes several other components (customs, infrastructure, international shipments, logistics competence, tracking and tracing, and timeliness score). Figure 1

**Figure 1: Overall World Logistics Performance Index (LPI)**




Data source: Arvis Jean-François *et al*, (2018) World Bank

**Figure 2: Quality of Trade and transport-related infrastructure (1=low to 5=high)**


Data source: Arvis Jean-François et al, (2018) World Bank

shows that Africa had the lowest logistics performance on average in 2018, with a score of 2.5 and ranking 116th. Uganda ranked 102nd with a score of 2.6 above the African average. However, this was below the LPI performance of North America and Europe, with a rank of 28 (Score of 3.6) and 43 (score of 3.3), respectively. Takele (2019) attributes Africa's low performance to poor quality of trade and transport infrastructure, and inefficiencies at customs and border posts. Poor transport infrastructure limits the development of Africa's logistics markets due to inadequate rail and road connectivity.

### Trade and Transport related infrastructure

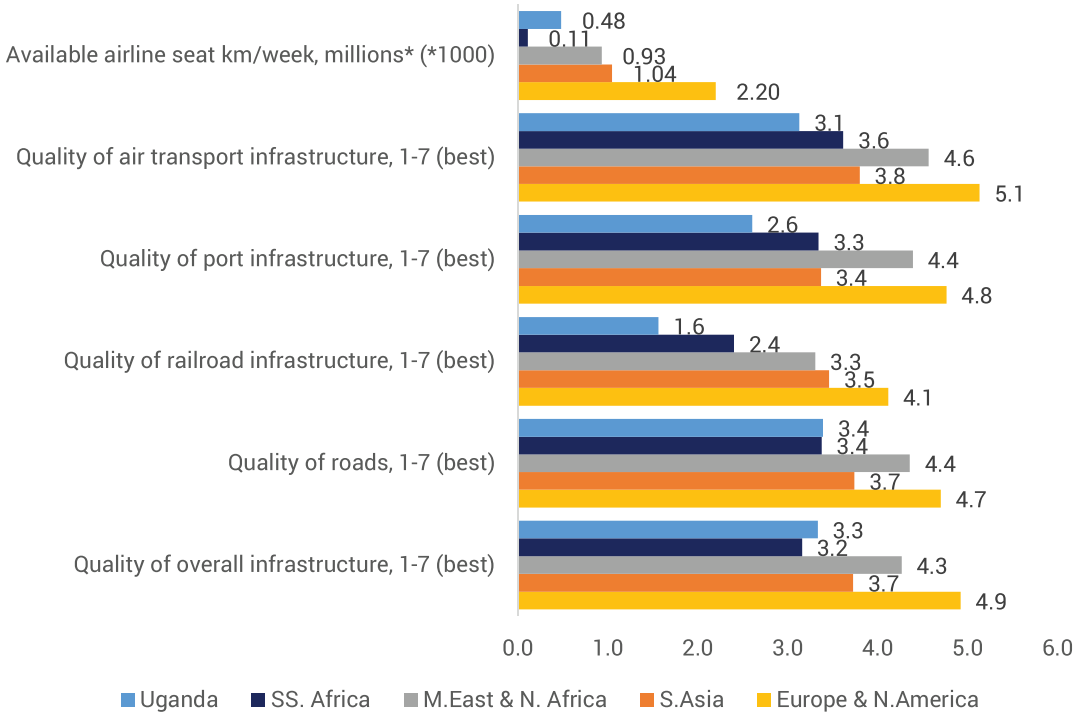
The trade and transport related infrastructure score combines the quality and improvement of a given country's transport infrastructure, such as roads, airports, railways, seaports, and airports. In 2018, the ranking placed Africa's infrastructure in 115th place, far below North America and Europe, which ranked 28th and 45th, respectively (Figure 2). Africa's inadequate infrastructure accounts for about half the transport cost in intra-Africa trade. This increases the cost of doing business in the region. Most African countries lack a well-developed railway transport system (especially for cargo), as railway transport is one of the most effective logistics means. Air transport, on the other hand, is expensive, with *flights within Africa being 45 percent more expensive than flights across the world, according to the African Airlines Association report (2021)*[4]. This implies that road transport remains the better option for many Sub-Saharan countries without an efficient rail transport system and costly air transport. Most roads in Sub-Saharan Africa are poorly maintained and left unpaved (Ngezahayo et al., 2019). Efficient infrastructure facilitates adequate transport and eases the flow of goods locally and across borders. Countries with high infrastructure scores have strong transport systems, reducing logistical hindrances.

### Quality and quantity of road, rail, seaport, and airport infrastructure.

Africa's infrastructure quality and quantity are also lagging compared to Europe's,

4 According to The East African, Wednesday November, 2023, travellers within the continent not only pay higher ticket prices but also more tax on commercial flights. These high costs of air travel within Africa hinder trade. https://www.theeastafrican.co.ke/tea/business/high-costs-of-air-travel-in-africa-stifle-tourism-4426966

**Figure 3: Quality and quantity of road, rail, seaport, and airport infrastructure (per region).**




Data Source: World Economic Forum World Competitive Report, 2018

especially regarding rail density and airport connectivity efficiency. Figure 3 shows that Africa has a low quality of railroad infrastructure of 2.4 on average compared to European average of 4.1 (on a scale of 1-7). Africa's available airline seats per km[5]/ week is also lagging at 0.11. per 1,000 people compared to 2.2 available seats per 1,000 people in Europe. The Single African Air Transport Market (SAATM) provides an opportunity to improve air connectivity in Africa as a sole region with an institutional declaration to enhance air connectivity.[6] Uganda's railroad operates only 25 percent, with one international airport (Donaldson et al., 2017). This constrains the movement of highly valuable and perishable goods to the market, increasing damages and postharvest losses. The quality of the overall infrastructure in Sub-Saharan Africa is insufficient. The limited expanse of paved roads, less than ¼ (one-fourth) of the entire road network in sub-Saharan Africa indicates that African countries are still grappling with poor road conditions. This translates into increased costs, given that road transport is Africa's most predominant transport mode, comprising 80 percent of freight and 90 percent of passenger traffic. Therefore, policymakers have a task of addressing a holistic range of infrastructure challenges considering the different trade costs associated with the movement of goods within individual countries and across borders.

5 A measure of an airline's carrying capacity to generate revenue taken from multiplying the available seats on any given aircraft by the number of kilometres flown on a given flight

6 https://au.int/sites/default/files/documents/32186-doc-towards_the_african_integrated_high_speed_railway_network_aihsrn_development-e.pdf

### Time and cost of exports

Table 2 shows that the time and cost of border and documentary compliance for Sub-Saharan Africa is higher than the global average in 2020. The Global average time to export (border compliance) was 55 hours, while it takes Sub-Saharan Africa 97 hours to export. The cost of exporting goods in Sub-Saharan Africa is USD 603, above the global average of USD 400. The World Trade Organization (WTO) report 2018 shows that the total trade volume of Africa is small (USD 951 billion) compared to the rest of the world in relative terms. In addition, transport in Africa is usually irregular and undependable, thus increasing the cost of goods above their value and creating more considerable trade barriers than import tariffs.

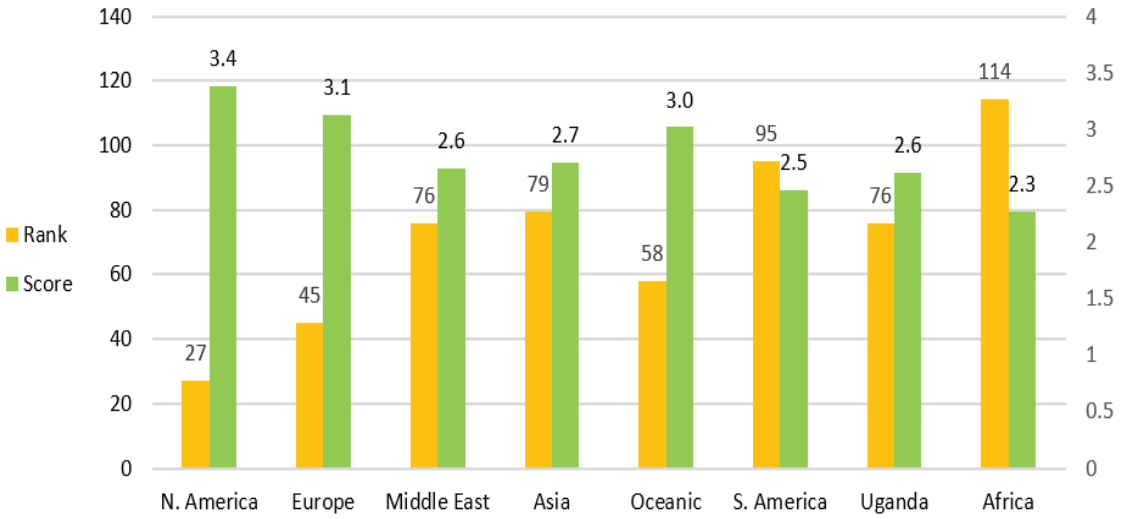
According to Takele (2019), landlocked developing countries incur 1.5 times more trading costs than coastal countries. This is because the costs of inland transport are higher, and time delays in transferring cargo to seaports depend on the quality of infrastructure and institutions of the neighbouring transit countries. It takes Uganda 71 hours to export and 154 hours to import regarding border compliance (World Bank Doing Business Indicators, 2020). Much as Uganda may be performing better than some of its regional counterparts, the challenges hindering the capability of firms to transport goods across borders need to be addressed so that the country can trade more competitively.

**Table 2: Time and cost of border and documentary compliance across regions, importing and exporting, 2020.**

| | Time to export: Border compliance (hours) | | Cost to export: Border compliance (USD) | | Time to export: Documentary compliance (hours) | | Cost to export: Documentary compliance (USD) | |
|---|---|---|---|---|---|---|---|---|
| | Importing | Exporting | Importing | Exporting | Importing | Exporting | Importing | Exporting |
| Europe & Central Asia | 20 | 16 | 158 | 150 | 23 | 24 | 86 | 87 |
| South Asia | 86 | 53 | 473 | 310 | 934 | 74 | 262 | 158 |
| EAC | 191 | 77 | 690 | 430 | 164 | 80 | 380 | 170 |
| COMESA | 126 | 86 | 677 | 493 | 91 | 73 | 340 | 187 |
| UMA | 99 | 46 | 490 | 490 | 62 | 60 | 224 | 157 |
| ECCAS | 195 | 149 | 1106 | 883 | 140 | 93 | 440 | 200 |
| ECOWAS | 112 | 98 | 625 | 514 | 91 | 67 | 252 | 134 |
| IGAD | 134 | 81 | 754 | 479 | 138 | 91 | 333 | 219 |
| SADC | 102 | 85 | 636 | 655 | 57 | 64 | 189 | 195 |
| CEN-SAD | 113 | 83 | 644 | 467 | 85 | 61 | 294 | 140 |
| African Average | 134 | 88 | 703 | 551 | 104 | 74 | 323 | 175 |
| S. S. Africa | 126 | 97 | 690 | 603 | 96 | 71 | 287 | 172 |
| Global Average | 75 | 55 | 481 | 400 | 64 | 55 | 186 | 145 |

Data source: Doing Business World Bank

**Figure 4: Efficiency of customs clearance process per region (1=low to 5=high)**




Data source: Arvis Jean-François et al, (2018) World Bank

## Customs clearance processes

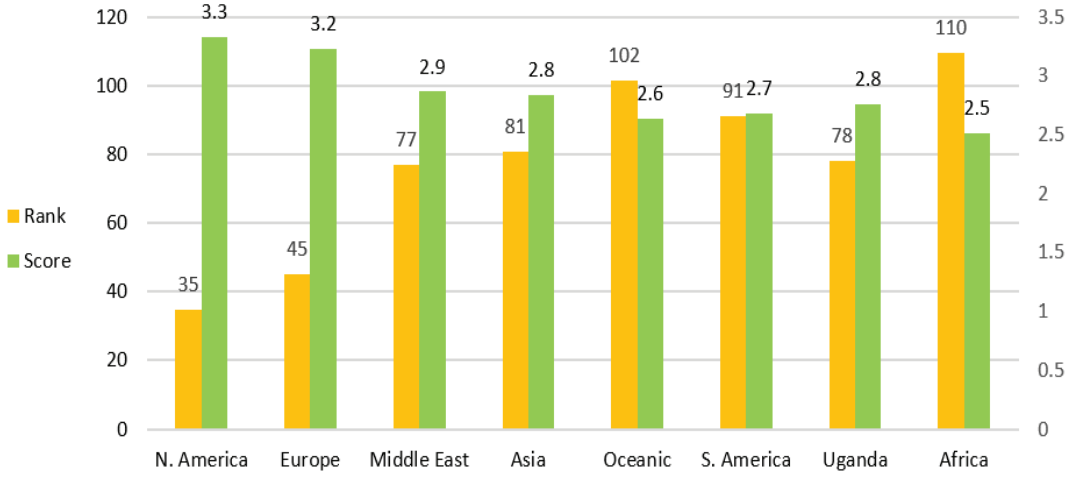
The efficiency of the transport and logistics sector considers the guaranteed supply of an array of support services and people. The effectiveness of customs is rated on the operations of transport operators, customs processes, and warehouse services. Figure 4 shows Uganda's customs efficiency ranked 76$^{th}$ above the African average of 114 in 2018. The customs score 2.6 indicates that Uganda's performance is average (on a scale of 1 – 5) but still low, much as it lies above the average African score of 2.2. Uganda being landlocked implies that the EAC shift to E-customs usage has partly eased customs clearance processes and facilitated Uganda's movement of goods across the border. Inefficient customs procedures increase the time to clear freight, which reduces trade volumes. Hence, delivering goods on time is critical for trade growth because it reduces trade costs and meets consumers' demand, thereby building their confidence (Olyanga et al., 2022).

## International shipments

According to the World Bank LPI indicators, the international shipments score measures how easily international shipments are arranged and conducted. This includes aspects such as the availability of international shipping services, the quality of logistics service providers, and the ease of use of global trade documentation. Figure 5 indicates that Uganda's performance is promising, with a score of 2.8 (out of 5), the same as the Asian (2.8) and Middle East countries (2.9). Uganda's performance is also above the average African score of 2.5.

Uganda, like other African and Asian countries, is constrained by NTBs in the form of lengthy clearance processes, especially for domestic-bound goods, compared to coastal countries. Other delays happen at the last point of clearance when goods arrive in the capital of a landlocked country (World Bank, 2010). The ease with which competitively priced shipments are arranged is reflected in reasonable pricing of fees at the port, airport, railroad, storage/ loading, and the fees charged by agents, which lead to reduced trade costs (Arvis et al., 2016). However, corrupt agents charge additional fees, increasing the cost of goods transferred to the final consumer. Therefore, addressing corruption and illegitimate practices at border points in Africa can

**Figure 5: Ease of arranging competitively priced shipments at the regional level (1=low to 5=high)**




Source: Arvis Jean-François et al, (2018) World Bank

significantly decrease trade costs (Barka, 2012).

### Tracking and tracing shipments

The tracking & tracing score replicates the capacity of a given country to provide prospects and tracking of shipments in real-time. Factors such as the use of modern tracking technologies, the obtainability of shipment tracking systems online, and the correctness of tracking information are considered.

Figure 6 shows that Uganda scored 2.4, slightly below the African average of 2.5, and ranked 123rd globally, compared to Africa's average rank of 111. Although the score difference appears marginal, Uganda's lower ranking highlights significant challenges in transparency and traceability

**Figure 6: Tracing and tracking shipments score(1-5) and Rank (all the countries involved)**

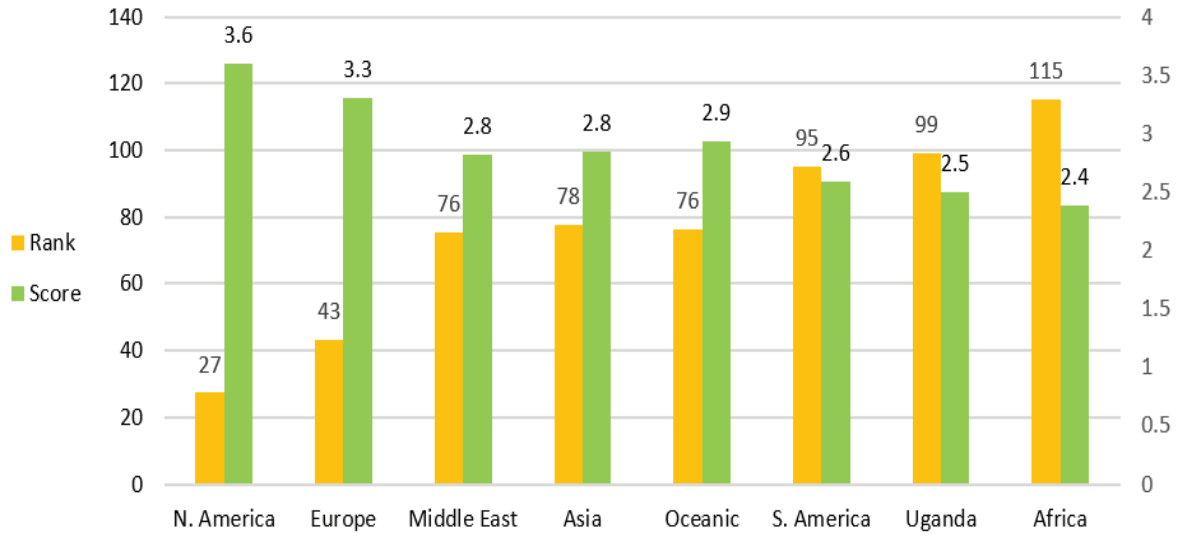

Data source: Arvis Jean-François et al, (2018) World Bank

within its logistics and trade infrastructure. This suggests that businesses in Uganda face greater difficulties in tracking goods, anticipating disruptions, and ensuring smooth supply chain operations. The inefficiencies could stem from gaps in digital tracking systems, inadequate customs procedures, or weak coordination among trade-related institutions. Therefore, firms need to be able to identify the whereabouts of their products to plan, forecast, and reduce the chances of goods getting lost (Korinek & Sourdin, 2011). This can be done by adopting the latest technology to strengthen their logistics management system, such as electronic tracking, which minimises the incidences of cargo diversion and lessens the clearance time at the border ((Olyanga et al., 2022).

### Competence and quality of logistics services

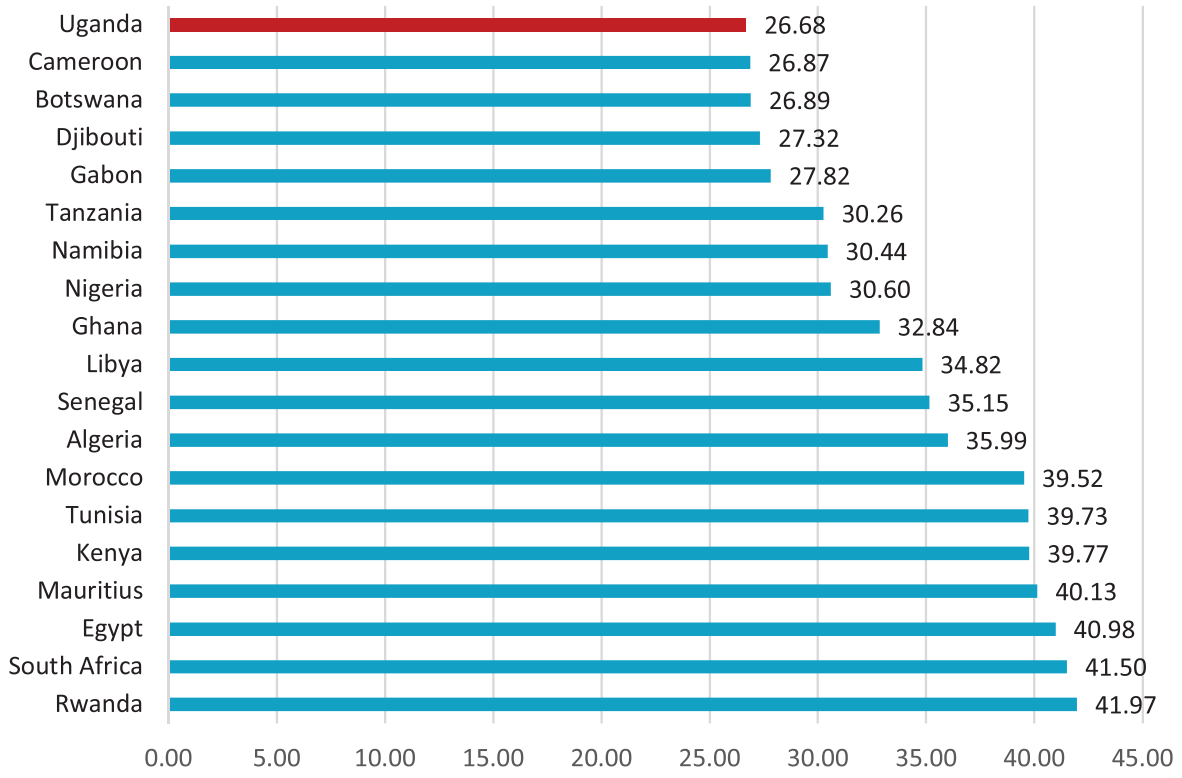
The logistics competence score measures a country's capacity to offer quality logistics services, such as logistics skills, expertise of logistics operators, and accessibility to providers of logistics services. Figure 7 shows that Africa's logistics competence falls in 115th place with an average score of 2.4 (on a scale of 1-5). North America takes the lead in the 27th position (score of 3.6), followed by Europe in the 43rd position (score of 3.3). Uganda ranks in 99th place above the African average, scoring 2.5. This implies that regions with higher logistics competence scores have more developed logistics sectors in terms of skilled personnel and extensive logistics service opportunities, which ensure adequate control and management of goods along the supply chain. Countries with a high logistics performance can easily access domestic and international markets at a lower cost due to good transport infrastructure and dependable supply chains (Arvis et al., 2016). Therefore, improvement in the quality of logistics infrastructure, customs clearance processes, and capabilities of logistics services competencies can boost supply chain deliveries in African countries ranging from the delivery of shipments on time, arranging competitively priced international shipments with ease, and tracking and tracing consignments accurately (Olyanga et al., 2022).

**Figure 7: Competence and quality of logistics services per region (2018) score (1-5) and Rank (all the countries involved)**




Data source: Arvis Jean-François et al, (2018) World Bank

**Figure 8: Innovation capacity score of select African countries, 2022**




Source: Global Innovation Index, 2022

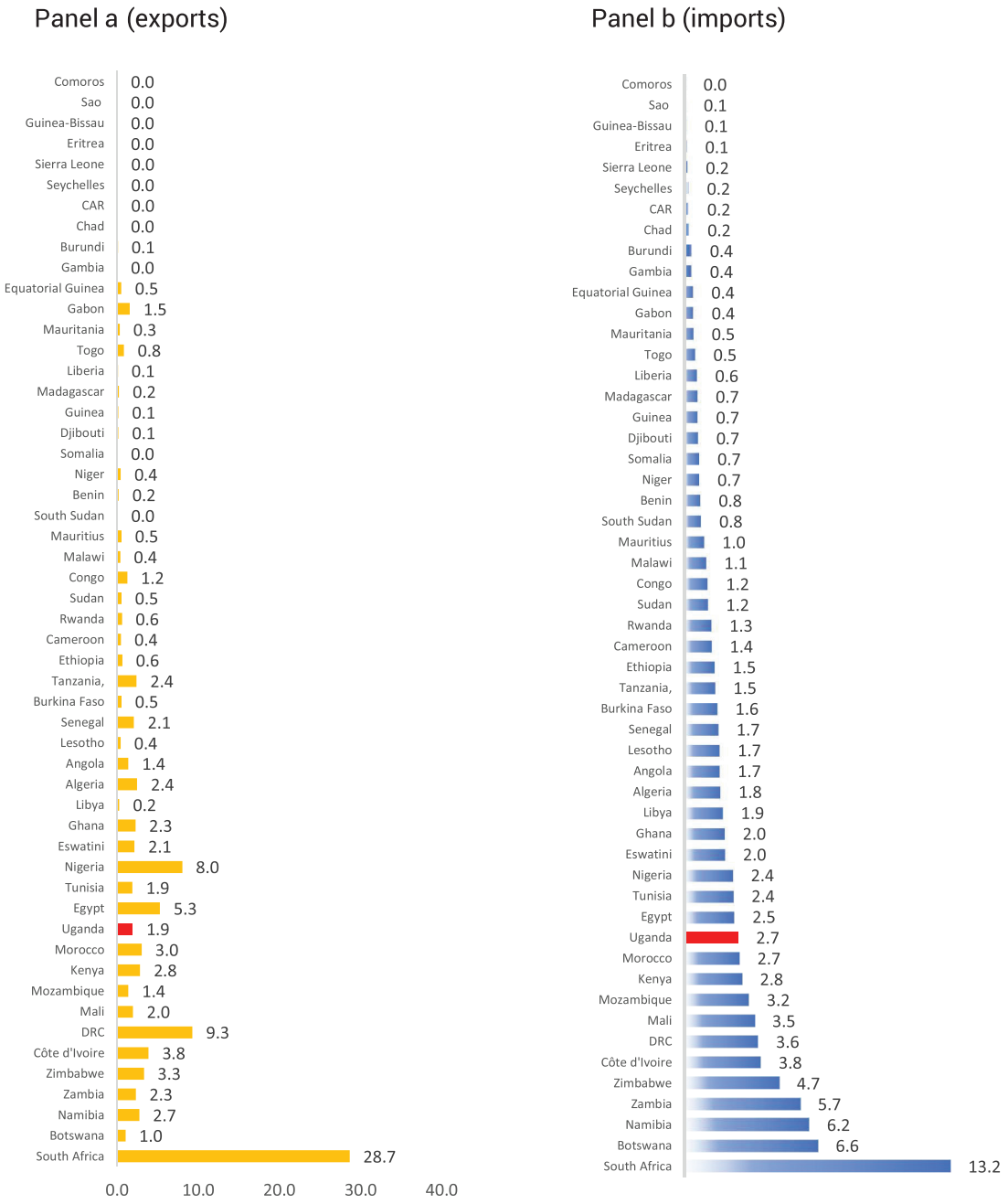
### Innovation capacity

Figure 8 shows that Uganda lies at the bottom of the pyramid of innovation capacity out of 19 select African countries, with a score of 26.7 compared to Rwanda (42) and South Africa (41.5). In 2023, Uganda ranked 121st in innovation outputs with a low performance lower than the African average in infrastructure, human capital and research, creative outputs, business sophistication, and market sophistication (Global Innovation Index, 2023). Thus, Uganda must improve the capacity of firms to create new ideas and identify new market opportunities by exploiting available resources. This can be facilitated by suitable government policy to permit investment in technology and knowledge-based capital to allow firms to conduct experiments using up-to-date technology and business models to expand and increase their market share (Tandrayen-Ragoobur, 2022). In addition, financing innovation is critical for infant local firms to innovate and advance into the export market.

### Intra-Africa trade

At the regional level, intra-Africa exports are still low compared to intra-Africa imports. Figure 9 reveals that, on average, South Africa has the most advanced exports totalling 28.7percent, followed by DRC (9.3 percent), Nigeria (8percent) and Egypt (5.3 percent). Over the past 3 (three) decades, Rwanda and Uganda made the utmost improvement in their export basket, yet other African countries' quality developments have been relatively slow, characterized by setbacks (Songwe, 2019). More developed and liberalised economies, such as South Africa, have better renowned manufactured exports and have greatly improved product quality, hence the need to explore new continental markets with more prospects to innovate and to expand their competitive advantage (ibid). Variations in export

**Figure 9: State Parties average proportions of intra-Africa exports and imports (percent)**




Data source: ITC Trademap, 2022

performance and product complexity among African countries indicate that the region has the potential to diversify and compete more favourably on the world market. According to UNCTAD (2020), Africa's unexploited export potential is USD 21.9 billion, equivalent to 43percent of intra-African exports. In addition, under the AFCFTA, the continent can realise USD 9.2 billion worth of export potential via partial tariff liberalisation in the subsequent five years. Hence, to unlock the regions' unexploited potential, intra-Africa trade bottlenecks need to be addressed, such as infrastructure gaps and market information asymmetries, and this will necessitate combined efforts under the AfCFTA arrangement.

Although Uganda ranks higher than the African average in the quality of logistics services its overall logistics performance indicators are poor and thus require improvement to boost market access and intra-Africa trade.

## 4.2 Model estimation

### 4.2.1 Descriptive statistics

Before estimating the gravity model, the study undertook a descriptive analysis to establish the salient characteristics of the study variables for both the exporting (Uganda) and importing trade partners (other African countries) presented in Table 3. We use annual panel data for the 54 African countries covering ten years from 2011 to 2020. The average value of exports is USD 4,983 million during the period under consideration. The average value of the exporter's and importers' GDP is USD 33,402 million and USD 46,513 million, respectively. The range of the importers' GDP, spanning from a minimum of USD 230 million to a maximum of USD 510,000 million, reflects

**Table 3: Summary Statistics of the Study Variables**

| Variable | Obs. | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Exports (USD million) | 527 | 4,983 | 1,121 | 3,500 | 6,600 |
| GDP_Exp (USD million) | 527 | 33,402 | 4,646 | 27,000 | 41,000 |
| GDP_Imp(USD million) | 511 | 46,513 | 92,048 | 230 | 510,000 |
| Populaton_Exp ('000') | 527 | 39,301 | 4,014 | 33,000 | 46,000 |
| Population_Imp ('000') | 518 | 22,296 | 32,338 | 87 | 210,000 |
| Distance | 517 | 3,151 | 1,521 | 377 | 6,374 |
| Contingency | 517 | 0.097 | 0.296 | 0 | 1 |
| Common colony | 517 | 0.323 | 0.468 | 0 | 1 |
| Common language | 517 | 0.42 | 0.494 | 0 | 1 |
| LPI_Exp | 316 | 2.772 | 0.207 | 2.58 | 3.04 |
| LPI_Imp | 442 | 2.467 | 0.328 | 1.34 | 3.78 |
| Road_Exp | 527 | 3.239 | 0.201 | 2.9 | 3.5 |
| Road_Imp | 351 | 3.455 | 0.853 | 1.9 | 5.4 |
| Railway_Exp | 527 | 1.52 | 0.075 | 1.4 | 1.6 |
| Railway_Imp | 259 | 2.48 | 0.685 | 1.3 | 4 |
| Water_Exp | 527 | 2.932 | 0.481 | 2.5 | 3.8 |
| Water_Imp | 351 | 3.583 | 0.827 | 1.4 | 5.7 |
| Air_Exp | 527 | 3.321 | 0.307 | 3 | 3.9 |
| Air_Imp | 351 | 3.775 | 0.91 | 1.1 | 6.1 |
| Innovation_Exp | 527 | 26.744 | 2.895 | 20.54 | 31.21 |
| Innovation_Imp | 306 | 26.068 | 4.851 | 12.66 | 40.94 |
| Avail_Latest_Tech_Exp | 527 | 4.24 | 0.175 | 4.1 | 4.6 |
| Avail_Latest_Tech_Imp | 350 | 4.169 | 0.694 | 2.7 | 5.7 |
| Tech_Readiness_Exp | 527 | 2.87 | 0.064 | 2.8 | 3 |
| Tech_Readiness_Imp | 353 | 2.995 | 0.592 | 1.9 | 4.7 |
| Internet Usage_Exp | 527 | 18.089 | 3.641 | 12.5 | 21.9 |
| Internet Usage_Imp | 350 | 20.019 | 16.442 | 0.3 | 58.3 |

Source: Author's Computation.

the diversity in economic growth across the continent, with Sao Tome and Principe exhibiting the lowest growth levels during the study period.

Notably, the population of the exporting country (Uganda) has an average of nearly 39 million persons. On the other hand, the importer's population exhibits an aggregated mean value of approximately 22 million persons in the period. The findings show that the least populated countries are Seychelles and Sao Tome & Principe, whereas the most populated countries include Nigeria and Ethiopia. The distance variable has an average value of 3,151 Kms, with minimum and maximum values of 377 Kms and 6,374 Kms. Whereas Uganda has a shorter distance from countries like Rwanda and Kenya, it has a significantly longer distance from Cape Verde, Senegal, and Mauritania. This explains why most of Uganda's leading export destinations are within the Eastern African region. The time-invariant control variables contingency, common colony, and common language dummies take on the minimum and maximum values of 0 and 1, respectively.

Focusing on the key variables, the average value of the Logistics Performance Index (LPI) for the exporting and importing countries are 2.772 and 2.467, respectively. The quality of Uganda's road, railway, water, and air transport infrastructure (measured on a scale between 1 - 7) has mean values of 3.2, 1.5, 2.9, and 3.3, respectively. On the other hand, the variables capturing the quality of road, railway, water, and air transport infrastructure within the importing countries (other trading partners in Africa) have average values of 3.5, 2.5, 3.6, and 3.8, respectively. These values show that Uganda's transport infrastructure is of relatively low quality compared to that of its counterparts within the African region.

The innovation variable (proxied by the Global Innovation Index) for the exporting and importing countries has average values of 26.7 and 26.0, respectively. The countries with the lowest Innovation scores include Burundi, Guinea, Niger, and Sudan. On the contrary, South Africa and Mauritius bear the highest innovation scores in Africa within the same period. Considering the availability of the latest technology, the respective average values of the exporter and importer are 4.24 and 4.17 (measured on a scale between 1 - 7), with Kenya, Rwanda, Morocco, and Seychelles possessing the highest values.

Similarly, the technology readiness variable has average values of 2.87 and 2.9 for the exporting and importing countries, respectively. Countries like Algeria, Mauritius, Seychelles, and South Africa are relatively more ready to implement new technologies than their counterparts. Lastly, the Internet usage variable exhibits respective average values of 18.0 and 20.0 for the exporting and importing countries.

Additionally, the study adopts a correlation analysis to investigate the nature of linear relationships among the variables and examine the existence of multicollinearity within the regression model. Table A.1 (see the Appendix) displays a pairwise correlation matrix of the variables employed within this study. The results show that the regression model does not suffer from the multicollinearity problem since the explanatory variables' correlation coefficients are below the acceptable threshold of 0.8 (Studenmund, 2001).

### 4.2.2 Estimation results

This section provides the results of the empirical analysis of the augmented gravity model, as shown in Table 4, and critical issues emerging from Key Informants.

**Table 4: PPML Estimation of the Gravity Model**

| Dependent Variable: Exports | Estimation approach: PPML | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| ln_GDP_Exp | 0.270* | 1.395*** | 1.948*** |
| | (1.75) | (0.67) | (0.18) |
| ln_GDP_Imp | 0.0770 | 0.0490 | 0.0267 |
| | (0.13) | (0.14) | (0.08) |
| ln_Popn_Exp | 1.575*** | 0.115** | 6.125*** |
| | (0.89) | (0.59) | (0.27) |
| ln_Popn_Imp | -0.0110 | 0.0119 | -0.0134 |
| | (-0.17) | (0.33) | (-0.39) |
| ln_Distance | -0.134*** | -0.103*** | -0.220*** |
| | (0.13) | (-0.15) | (-0.41) |
| Contingency | 0.0994** | 0.0180** | 0.0575** |
| | (0.05) | (0.16) | (0.55) |
| Common colony | 0.0251 | 0.0399 | 0.0111 |
| | (0.15) | (0.58) | (0.21) |
| Common language | 0.0171 | 0.0361 | 0.0151 |
| | (0.11) | (0.50) | (0.23) |
| LPI_Exp | 0.145*** | | |
| | (4.06) | | |
| LPI_Imp | 0.0414*** | | |
| | (0.21) | | |
| Road_Exp | | 0.119** | |
| | | (0.17) | |
| Road_Imp | | 0.0834 | |
| | | (0.02) | |
| Railway_Exp | | 1.451*** | |
| | | (0.36) | |
| Railway_Imp | | 0.0279 | |
| | | (0.55) | |
| Water_Exp | | 0.884*** | |
| | | (1.02) | |
| Water_Imp | | -0.0205 | |
| | | (-0.53) | |
| Air_Exp | | 0.966*** | |
| | | (1.32) | |
| Air_Imp | | 0.0185 | |
| | | (0.33) | |
| Innovation_EXP | | | 0.0398*** |
| | | | (0.28) |
| Innovation_Imp | | | 0.0389 |

| Dependent Variable: Exports | Estimation approach: PPML | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| | | | (0.56) |
| Tech_Readiness_Exp | | | 1.186*** |
| | | | (0.94) |
| Tech_Readiness_Imp | | | 0.0815 |
| | | | (0.10) |
| Avail_Latest_Tech_Exp | | | 0.698*** |
| | | | (0.85) |
| Avail_Latest_Tech_Imp | | | -0.0133 |
| | | | (-0.25) |
| Internet Usage_Exp | | | 0.0849 |
| | | | (1.66) |
| Internet Usage_Imp | | | -0.0110 |
| | | | (-0.47) |
| Constant | -11.36*** | -15.48*** | -45.14*** |
| | (-1.36) | (-4.83) | (-3.97) |
| Observations | 254 | 259 | 269 |
| Pseudo R-Squared | 0.865 | 0.980 | 0.984 |

*Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

Source: Author's Computation.

In general, the findings reveal that the estimation coefficients of the basic (or standard) gravity model variables (i.e., GDP, Population, Distance, Contingency, and Common Language) corroborate the theoretical underpinnings of the gravity model. Besides the gravity model variables, this study's major variables of interest include the logistics performance index, transport infrastructure quality indexes (road, railway, air and water/port), global innovation index, technological readiness index, availability of the latest technology, and internet usage. Both the importing and exporting countries were considered during the analysis of these variables. The decision to analyse three models (1, 2, and 3) is premised on the need for the study to obtain individual effects of the identified trade enhancing and impeding variables. Whereas model (1) captures the LPI, model (2) and (3) show the results of transport infrastructure quality and technology & innovation effects on exports, respectively.

The study findings show that Models (1), (2), and (3) corroborate that Uganda's exports are significantly influenced by the growth in its economy (proxied as GDP). For instance, Model (3) suggests that, on average, a 1 percent increase in Uganda's GDP is associated with an increase in exports by approximately 0.02 units, holding other factors constant (at a 1 percent level of significance). However, it is essential to note that the magnitude of the change is relatively small, thus implying that an increase in GDP alone has a minimal impact on Uganda's exports. On the contrary, growth in the importer's GDP has no significant effect on Uganda's exports. This implies that economic growth in other African economies does not necessarily translate into increased demand for Uganda's exports.

Similarly, the study reveals that an increase

in Uganda's population positively and significantly affects its export levels. More succinctly, Model (3) shows that a 1 percent increase in Uganda's population is on average associated with a 0.06 unit increase in exports, holding other factors constant (at a 1 percent significance level). This implies that Uganda should strive to harness its demographic advantage for export growth by prioritising investments in education and skill development programs to improve labour productivity and enhance the population's potential to contribute positively to export-oriented sectors.

The estimation findings show that distance significantly impeded trade flows between Uganda and her trading partners in Africa. This variable captures the trade and transaction costs between the exporting and importing partners. In particular, model (3) reveals that increasing distance by 10 percent on average tends to reduce Uganda's exports by 0.022 units, holding other factors constant (at a 1 percent level of significance). To optimally benefit from AfCFTA, African economies should strive to boost connectivity and transport networks to increase market access and lower transport costs. Similarly, the contingency variable reveals that sharing a common border with the importing country positively impacts Uganda's export levels. For instance, Model (3) shows that on average, sharing a common border yields an approximately 0.05 increase in Uganda's exports, compared to not sharing one, holding other factors constant at a 5 percent significance level.

The study shows that improvements in the logistics performance index positively and significantly affect exports for both the importing and exporting countries. The LPI enables countries to identify enhancers and impediments in trade logistics and how they can boost their performance and improve trade flows. In particular, model (1) shows that, on average, a 1 unit improvement in the

**Box 1: Logistics constraints**

i. There is heavy reliance (about 90 percent) on road transport due to the absence of other less costly transport means, including railroad and water. Road transport is inefficient and expensive, and the African road network is small and poor.

ii. Given Uganda's significant dependence on intermediate inputs, this increases production and transportation costs, making Uganda's products less competitive compared to its peers.

iii. Air travel remains costly, especially for distant African regions. Also, Ugandan airlines may not sustainably cover all travel routes within Africa, leaving some regions unreachable and costly to trade with.

iv. The logistics industry is not well developed, characterised by a lack of professionalism, shortage of skilled manpower, inadequate storage facilities, and insufficient requisite handling equipment

v. Although Africa has expressed interest in trading, acquiring movement permits and visas remains challenging for most countries. Restrictions still exist, hampering movement.

vi. Although border movements have significantly improved, delays are often experienced, increasing the cost of doing business, especially in some African countries where governance challenges persist, such as the DRC, Somalia, and South Sudan.

logistics performance index tends to boost export volumes for the exporter and importer by 0.14 and 0.04 units, respectively, holding other factors constant (at a 1 per cent significance level). This implies that African State Parties should strive to improve the several components underpinning the LPI to boost export growth. Views from KIIs collaborate on these findings, as summarised in Box 1, detaining the logistics challenges.

This would necessitate enhancing the effectiveness of customs and border management clearance processes, elevating the standards of trade and transport infrastructure, facilitating smoother arrangement of shipments, upgrading the quality of logistics services, strengthening the capability to track and trace consignments, and ultimately, enhancing the consistency with which shipments reach consignees within scheduled or anticipated delivery times.

Focusing on the transport infrastructure variables (road, railway, air, and water/port), the study finds that the quality of transport infrastructure significantly influences exports, especially for the exporting country (In this case, Uganda). However, on the side of the importing country, the study reveals those improvements have no significant effect on the export levels of Uganda. This means that improvement in the transport modes of other trading partners may not necessarily translate into an increase in trade flows. This implies that African countries should strive and go beyond conventional infrastructure improvements and seek to tackle other transport-related trade-impeding factors, including border controls, customs procedures, and logistical issues, among others.

Notably, model (2) reveals that a 1 unit increase in the quality of road infrastructure yields a 0.12 unit increase in Uganda's export, holding other factors constant (at a 5 percent significance level). Similarly, a 1-unit improvement in railway infrastructure quality increases Uganda's export volumes at a 1 percent significance level, holding other factors constant. Likewise, a 1 unit increase in the water infrastructure quality is associated with a 0.88 unit growth in Uganda's export volumes, holding other factors constant (at a 1 percent significance level). Lastly, a unit increase in the quality of air transport tends to boost Uganda's exports by 0.966 units on average, holding other factors constant (at a 1 percent significance level). It is important to note that improving the quality of the railway infrastructure has a more significant magnitude effect on Uganda's export levels than other transport modes. These findings are consistent with those of Ismail & Mahyideen (2015), Coşar & Demir (2016), Xu (2016), Martincus et al. (2017), Bottasso et al. (2018), and Wessel (2019).

Focusing on the global innovation index, the study reveals that innovation capacity and capability advancement significantly improve export volumes (especially for the exporting country). More succinctly, model (3) shows that on average, a 1 unit increase in the exporter's innovation capacity tends to boost exports by 0.039 units, holding other factors constant (at a 1 percent significance level). This underscores the need to prioritise initiatives that boost innovations, for instance, investing in research and development, promoting collaboration between industries and research institutions, and supporting entrepreneurship. By doing so, Uganda can bolster its innovation ecosystems, fostering a conducive environment for developing cutting-edge products and services for exports.

The analysis reveals that technology is crucial in fostering export growth, especially for exporting countries. In particular, model

**Box 2: Innovation and technology**

There is a salient disintegration within the technology and product development value chain, which hinders robust academia-industry linkages. This is made worse by insufficient specialized resources and human capital to strengthen technology and product development across innovation clusters. At the policy level, there is a lack of regulatory policies to nurture the growth of technology development clusters within Uganda's innovation ecosystem. The private sector, on the other hand, plays a dismal role in engaging the innovation landscape. Therefore, nurturing innovation takes a strategic approach that requires investment in education, research and development, and technology adoption. This implies that collaboration among stakeholders is key to cultivating an environment conducive to innovation. Therefore, policies incentivising R&D and facilitating funding accessibility are critical. However, this will only work when the requisite infrastructure is implemented.

(3) suggests that, on average, a 1 unit improvement in Uganda's technological readiness spurs growth in the level of exports by 1.18 units, holding other factors constant (at a 1 percent significance level). Similarly, the availability of the latest technology positively impacts the exporter's export volumes. Notably, model (3) reveals that a 1 unit increase in the newest technology boosts export growth by 0.69 units at a 1 percent significance level, holding other factors constant. The country's terrain regarding technology and innovation is faced with several challenges, as voiced by KIIs in Box. 2

### Standards and quality of products

The low level of compliance and enforcement of process and product standards have been Uganda's major impediment to reaping the benefits of regional and international trade, and this is likely to persist under the AfCFTA if it is not addressed. For Uganda to increase its exports and penetrate new markets in Africa, compliance with standards and technical regulations is necessary. The level of rejection of Uganda's exports to the European Union is evidence and attests to this challenge. This is because this signals and guarantees the quality of products exported. However, the volume and complexity of technical regulations and the variation in certification, testing, inspection practices and standards used by different African countries remain an impediment to achieving this goal. A typical example is the inability of Uganda to take advantage of the offer by Algeria to export milk products owing to the traceability requirement, which exporters cannot meet. There are inadequacies at both national and international levels regarding quality infrastructure systems, including metrology, standardisation, accreditation, quality management and conformity assessment.

The existing African Regional Intellectual Property Organisation, which would serve as the standards organisation, has limitations. Consequently, the strategy is to leverage the REC-level standards harmonisation process as the building block for the continental. Within Africa, the EAC has attempted to harmonise standards for the Partner States, although with dismal results, as evidenced by the rejections of products from Uganda to immediate neighbours. Notwithstanding this progress, significant and glaring gaps persist, given that RECs must be sufficiently coordinated at the continental level. There is a need to establish trust in inspection, testing, and certification conducted by the State Parties to develop mutual recognition. Other challenges include reluctance by State

Parties to adopt standards from other RECs, lack of financial and technical resources and the unnecessary trade barriers faced by exporters due to differences in technical regulations and standards. KIIs respondents suggested that fast-tracking and harmonisation of standards should be prioritised at the continental level.

At the national level, even with increased development and issuance of standards and conducting conformity assessments in Uganda, the national quality infrastructure capacity still faces challenges that are likely to limit market penetration at the AfCFTA level. Uganda National Bureau of Standards (UNBS) still faces difficulties in supporting the private sector in terms of laboratory testing capacity, quality certification of the products, and the elimination of substandard goods on the market. The main challenges faced include low laboratory capacity to support the growing demand by the private sector, staffing still lags behind the approved staff establishment, and inadequate funding to execute and facilitate activities. Respondents noted that exporting to the AfCFTA market is impossible without the requisite standards.

The capacity of many Small and medium Enterprises (SMEs) in Uganda to meet the compliance and standards regulatory requirements remains a challenge, implying their participation in the export sector is diminished. Efforts to hasten and simply standards acquisition, especially by (SMEs) have yielded dismal results.

There is a need to build the capacity of SMEs to adhere to the basic mandatory standards prescribed by UNBS. Additionally, there is a need to reach mutual recognition and understanding of the standards of the products. Relatedly, Uganda will face stiff competition, especially with the penetration of foreign products with higher quality and value on the domestic market. In addition, due to the poor quality of products, Uganda may need to realise the expected returns from the sale of products, an issue related to competition. For example, Uganda's tea fetches low prices because it is not blended and processed to high standards. The Soroti fruit Factory is struggling to secure a market for its concentrates, domestically implying that exports are even more difficult. This is because other sources offer cheaper concentrates than what Soroti produces. Improving packaging, blending, and the product space remains challenging, diminishing Uganda's ability to compete in the continental market.

Therefore, the country needs to strengthen the national conformity assessment regime as it Therefore, strengthening the national conformity assessment regime is necessary as the country seeks to optimise its benefits from the AfCFTA. Uganda will need to certify and license private laboratories to undertake some roles and strengthen the coordination between UNBS and its international (African) counterparts to improve the accreditation of the country's products.

### Non-tariff barriers and non-tariff measures (NTMs)

Although the AfCFTA seeks to lower tariffs to enable the free movement of goods, there are stringent NTBs, which, in many cases, are attempts by states to create new sources of revenues and avoid the path of a race to the bottom. NTBs and non-tariff measures (NTMs) are a significant barrier to Uganda's trade with State Parties. These manifest as infrastructural, policy and procedural constraints that create trade bottlenecks – complex clearance procedures, cumbersome documentation requirements and unpredictable trade policies. Some countries have resorted to measures such as surcharges, environmental levies, transit fees, etc., that undermine the competitiveness of Uganda's products in some State Parties. Uganda has

experienced significant. s on maize in South Sudan and Kenya in the recent past and on sugar and milk in Kenya. Without a solid legal framework and punitive measures for perpetrators, NTBs are likely to persist under the AfCFTA. The existence of protocols to address NTBs has failed because of weak or no implementation of such provisions.

### Conflicts on the African continent

Uganda's neighbourhood is characterised by several fragile and conflict-affected State Parties where the lack of the rule of law is prevalent. The DRC and South Sudan are typical examples in addition to Somalia. These have made it sometimes difficult to export products, and, in some instances, traders have either lost money or have been killed. Trading with partners whose weak adherence to governance principles and the rule of law is a considerable risk. Many Uganda traders lost money, property and goods during the internal conflict in South Sudan. As AfCFTA implementation gets underway, Uganda needs the capacity and flexibility to adapt its risk frameworks and interventions to changing conditions on the ground. This requires innovative thinking about risks and the right actions as they emerge.

### Business and market information

Ugandan traders will likely face difficulties in regional markets due to a lack of business and marketing information on prices, market conditions, sanitary and phytosanitary standards (SPS) measures, exemptions and benefits of Uganda's membership. There is an information gap that supports manufacturers and traders in producing the required market trends and making informed business decisions. Although the Uganda Exports Promotions Board has some initiatives to address this issue, limited funding for the agency renders its interventions inadequate. Uganda's economic and commercial diplomacy is not strategic enough to address this challenge. There is a need to strengthen the portfolio of commercial attaches in Ugandan Missions and equip them with negotiation skills and periodic training on international trade issues. Export development and promotion initiatives should focus on SMEs and address the challenges they face in reaching out to new markets, given that they are disadvantaged.

### Supply-side constraints and inadequate systems for bulking products

Agriculture, a leading sector in Uganda's export basket, is characterised by low productivity partly due to poor input use and limited use of production-enhancing technologies. Consequently, when opportunities arise, it has been demonstrated that the country cannot supply consistently. Restricted access to modern farming techniques and technologies negatively impacts production and productivity. The government is dominated by small-scale farmers who lack the necessary resources and support to adopt efficient agricultural practices to maximise output and productivity. In a situation where many small-scale farmers have inadequate bulking and aggregation systems, exports of farm products are even more difficult. Occasionally, produce goes to waste owing to this limitation.

The manufacturing sector heavily depends on imported intermediates, which is problematic, especially during global market shocks and price movements. The consequent effects are heavily transmitted to the sector, sometimes leading to diminished competitiveness. Due to these two factors, Uganda's use of negotiated and preferential markets is still limited in volume and quality. Furthermore, to maintain and improve its international competitiveness, Uganda must strive to increase productivity throughout its economy, especially in the exporting sectors.

### Language barrier and differences in culture

It is a fact within the international trade ecosystem that languages play a significant role in enhancing or impeding trade. There is a diversity of languages and ethnic groups on the continent to the extent that communication is problematic. Africa faces significant challenges due to diverse cultural differences among State Parties, which impact trade negotiations, regulations, consumer preferences, and trust. Uganda is mainly Anglophone, whereas Africa has other regions, such as Francophone, Arabic, and Portuguese. Challenges related to language barriers include a high potential for miscommunication, misunderstandings, and a high number of trade disputes. Uganda traders have failed to penetrate some countries where the language is neither English nor Swahili. Trade agreements and documents are sometimes challenging to understand, requiring capacity-building initiatives, language training, translation, and interpretation services, which are additional costs.

### Multiple currency conversions

Although the AfCFTA framework provides for a Pan-African Payment and Settlement System (PAPSS), there are still challenges related to its implementation owing to the multi-currency nature of the continent. The PAPSS is an African Union infrastructure developed in collaboration with the African Export-Import Bank (Afreximbank) to support trading under the AfCFTA. The PAPSS works in partnership with Central Banks on the African continent to offer a payment and settlement service to which commercial banks, payment service providers and fintech organisations across the continent can connect as participants.

"*Challenges to the successful implementation of the PAPSS include fragmented financial infrastructure, differences in payment systems, regulatory frameworks, technological capacities, limited digital penetration and financial inclusion, complex currency conversion and exchange rate risks, regulatory and compliance hurdles, cybersecurity concerns, and integration with existing payment systems".*

### Trade finance

Access to affordable finance remains a significant impediment for local exporters. The bulk of private sector credit provides services at an average of 22 percent per annum in Uganda, which is not affordable. Although the AFREXIM Bank is trying to bridge the gap, it has structural limitations in that it is not tailor made for SMEs, which are the majority exporters in the country. This relates to the risks of exporting to volatile markets like DRC, CAR, Somalia, Burundi, and South Sudan. No mechanisms exist to de-risk exports, given the absence of export guarantee schemes.

An efficient and affordable trade finance system is critical to supporting Uganda's exports to State Parties as this increases the country's competitiveness. This implies that efficient, less expensive and cumbersome forms of trade finance are a must, but this is missing. Common trade finance forms include import and export letters of credit, import and export documentary collection, bills of exchange, pre-shipment and post-shipment finance, bank bonds and guarantees. In Uganda, letters of credit and documentary collections remain the dominant form of trade finance.

Unfortunately, most export and import business entities in Uganda do not qualify for trade finance facilities partly because of the reduction in international correspondent bank relationships and mainly because of the limited appetite of banks to lend to non-well-established clients. The other challenges relate to; high collateral and other financial requirements on clients to reduce risks; high costs of borrowing and

processing fees for opening trade finance facilities, lack of local business services which could support the demands of traders for such facilities, lack of creditworthiness and of the skills to formulate properly trade finance applications on the side of clients.

As a result, cash payments on delivery are still relatively common among exporters, particularly for small traders who need help to secure trade finance facilities. This locks up working capital as exporters must wait for payment, which takes time.

# 5 CONCLUSIONS AND ACTION POLICY RECOMMENDATIONS

Uganda exported an average of USD4.272 billion to the rest of the world in 2022 of which USD2.707 billion went to Africa. Within Africa, Uganda's share of intra trade is still small accounting for only 2 percent of intra-African export trade. Uganda is actively engaged in multiple RECs, including the AfCFTA, which provides vast opportunities for the country to increase exports and accelerate industrialization via trade and investments. Despite, the overwhelming market opportunities that the AfCTFA offers, there are significant underlying bottlenecks that may hamper Uganda from realizing the full benefits of AfCFTA that should be identified, assessed, and addressed. If not addressed, these constraints have the potential to hamper the country's ability to take full advantage of the trade opportunities and its effective participation in continental markets as it opens its domestic market to the continent. This study identified the impediments to Uganda's export growth under the AfCTFA and proposed viable market penetration strategies to increase Uganda's export market share under the AfCFTA. The following are the most pressing challenges identified by the study.

It has emerged that logistics constraints continue to play a significant role in impeding trade flows between Uganda and her trading partners within Africa. The poor quality and quantity of trade and logistics infrastructure explain this, particularly the heavy dependence on roads, which accounts for 90 percent of cargo transportation due to the absence of less costly means of transport, including railroad and water transport. This increases the cost of production, thereby making Uganda's products less competitive than those of its peers.

Although there are protocols addressing standards, standards harmonisation is still a challenge and the cost of product certification is high, especially for SMEs. This results in low compliance of process and product standards critical for export trade. There are inadequacies at both the national and continental levels regarding the harmonization of quality infrastructure systems and quality management, including metrology, standardization, accreditation and conformity assessment.

There are information gaps related to opportunities in destination markets. Ugandan traders face difficulties in accessing regional markets, due to lack of adequate business and market information on prices, market conditions, standards, sanitary and phytosanitary standards (SPS) measures, exemptions and benefits of Uganda's membership. Although the Uganda Exports Promotions Board has some initiatives to address this issue, limited funding to the agency renders their interventions inadequate. Uganda's economic and commercial diplomacy is not strategic enough to address this challenge.

The prevalence of NTBs, continue to impede Uganda's gains from AfCTFA. With reduction in tariffs, different countries try

to mutate NTBs, by resorting to unilateral actions like blockades, measures such as surcharges, environmental levies, transit fees, complex clearance procedures, cumbersome documentation requirements and unpredictable trade policies.

Supply side constraints render production and productivity low both in the agriculture and manufacturing sector. Agriculture is characterized by low productivity partly due to poor input use and limited use of production enhancing technologies which hinder consistent supply. The country is dominated by small-scale farmers who lack the necessary resources and support to adopt efficient agricultural practices to maximize production and productivity. In a situation of many small-scale farmers and inadequate bulking and aggregation systems, exports of agricultural products are even more difficult. In the manufacturing sector, the heavy dependence on imported intermediate inputs is problematic, especially in times of shocks in the global markets, leading to diminished competitiveness. Due to these two factors, Uganda's utilization of some negotiated and preferential markets is still limited both in volumes and quality.

The African payment system needs to be more cohesive and developed making it easier for traders to get their payments on time. The AfCFTA PSS is still under development and characterized by multiple currency conversion requirements, which pose challenges. In addition, access to affordable finance to support exports remains a major impediment for local exporters. Exporting to volatile markets like DRC, CAR, Somalia, Burundi and South Sudan is also risky. No mechanisms exist to de-risk exports, given the absence of export guarantee schemes.

Owing to conflicts in Uganda's neighbourhood, trading with some state parties has been problematic and, in some cases, has resulted in the loss of money, property, and life. The DRC and South Sudan are typical examples in addition to Somalia. Finally, there is a diversity of languages and ethnic groups on the continent to the extent that communication is problematic. Uganda traders have failed to penetrate some countries where the language is not English or at least Swahili.

## 5.1 Action policy recommendations

Table 5 summaries the action policy recommendations that have high potential to increase Uganda's chances of accessing the negotiated markets under the AfCFTA.

**Table 5: Action policy recommendations**

| | Policy Issue | Recommendation | Action |
|---|---|---|---|
| 1 | • Expensive, barely interconnected and unreliable transport systems, | To optimally benefit from AfCFTA, Uganda and African economies should strive:<br>• to boost connectivity and transport networks to lower transport cost to increase market access<br>• Invest in lower cost transport networks such as air, railways and water way | • Expand transport network systems<br>• Integrate and link the different transport networks (road, water and railway) -multi-model transport system<br>• Explore expanding the cargo section of Uganda airlines to boost exports to farther destinations |
| 2 | • A weak logistics industry characterised by delays, bureaucracy, increased costs and inefficiency | • Develop and leverage the logistics industry both at the national and continental levels to boost intra-African trade | • Upgrade and professionalise logistics (training, acquisition of modern equipment, and regulation of the sector)<br>• Install and upgrade logistics infrastructure like warehouses, refrigeration facilities to meet international standards<br>• strengthen the capability to track and trace consignments by integrating advanced digital solutions<br>• Streamline and sensitise the process of arranging shipments by identifying and defining the roles and mandates of different public and private actors. |
| 3 | • Technology and Innovation capacity. Uganda lies at the bottom of the pyramid of innovation capacity out of 19 select African countries, and ranks poorly in terms of innovation outputs | • There is need to prioritize initiatives that boost innovations to bolster the innovation ecosystems, and foster a conducive environment for the development of cutting-edge products and services for exports | • Investing in research and development<br>• Promote robust academia-industry linkages, collaboration between industries and research institutions, and supporting entrepreneurship.<br>• Invest in education and skill development programs to improve labour productivity and innovation |

| | Policy Issue | Recommendation | Action |
|---|---|---|---|
| 4 | Standards and quality of products | • Fast tracking the harmonisation of standards across the RECS and continent as a priority<br>• Strengthen the national conformity assessment regime to optimize Uganda's benefits from the AfCFTA | • Build the capacity of SME's to adhere to the basic mandatory standards prescribed by UNBS.<br>• Reach mutual recognition and understanding of the standards of the products with other countries<br>• Licence more private laboratories to undertake some roles of conformity assessment<br>• Equip and coordinate the regional UNBS offices to undertake some quality management roles currently centralised<br>• Simply complex standards for especially SMEs |
| 5 | Non-Tariff Barriers | • Strengthen, implement and adhere to the existing legal frameworks intended to curb the prevalence of NTBs<br>• Develop more robust dispute and resolution mechanisms for emerging unilateral actions by State Parties | • Implement punitive measures to perpetrators<br>• Harmonise and simply the complex clearance and cumbersome documentation requirements<br>• Review the efficacy of existing dispute and resolution mechanisms for emerging NTBs<br>• Propose a stronger appellate framework and system |
| 6 | Conflicts among Party States | • Seek diplomatic solutions to regional and national conflicts | • Endeavor to use existing structures (bilateral, RECs and AU) like the council of ministers and the summit in addition to other well wishers to resolve conflicts |

| | Policy Issue | Recommendation | Action |
|---|---|---|---|
| 7 | Business and market information | • Create regularly updated fora, avenues, information centres and databases easily accessible to all segments of the business community to enhance their participation in the AfCFTA | • Strengthen the portfolio of economic and commercial attaches in Ugandan Missions and equip them with negotiation skills and periodic training on international trade issues.<br>• Focus export development and promotion initiatives on SMEs and<br>• Address the challenges SMEs face in reaching out to new markets given that they are disadvantaged.<br>• Strengthen and engage business association in all proceeding of negotiations and implementation of integration provisions<br>• Leverage existing business associations as a platform for equal information sharing<br>• Create digital platforms and databases to share information on various aspects<br>• Participate in trade shows, trade fairs and exhibitions |
| 8 | Supply side constraints | • Through government programmes like Parish Development Model and MAAIF Strategic Plan to address challenges of production and productivity<br>• Increase capacity utilisation of the manufacturing sector by among others relying on domestic supply of inputs | •<br>• Invest in quality packaging, blending and storage of products<br>• Institute a collection and bulking system to improve aggregation to attain the required volumes |
| 9 | Language barrier and differences in culture | • Uganda should embrace a multilingual policy in the education and business systems to equip the business community<br>• Provide the business community with basic cultural awareness skills in preparation for business engagements in other parts of the continent | • The education curriculum should prepare learners in other languages<br>• Capacity building in language training, translation and interpretation services<br>• Implement programmes to orient citizens in interaction with other nationals |
| 10 | Trade finance | • Government should establish mechanism to ensure access to affordable export finance facilities for all sections of the business community | • Derisk exports through the establishment of export guarantee schemes<br>• Support the private to develop a wide range of trade finance products that are accessible and affordable |

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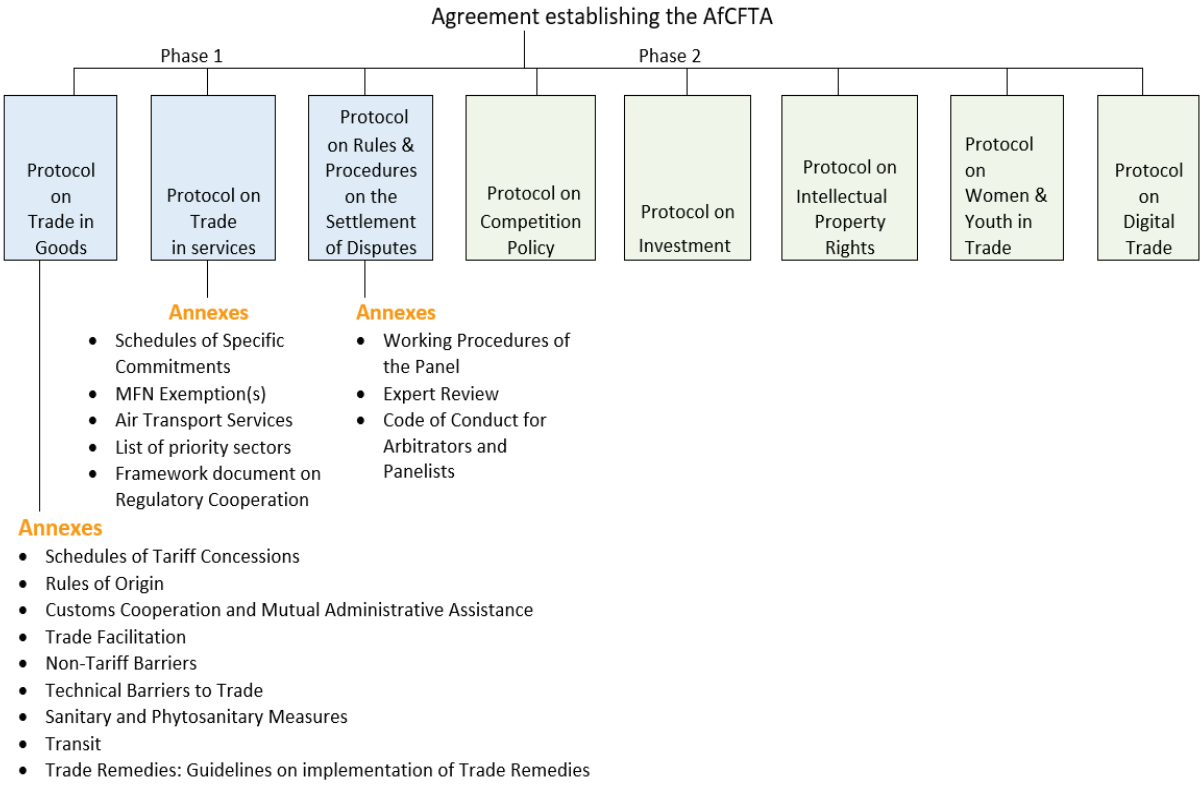
## APPENDIX

### Figure 1: Architecture of the AfCFTA




Source: MTIC, 2023

## Table A.1: Pairwise Correlations of the Study Variables

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) | (24) | (25) | (26) | (27) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Exports | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) ln_GDP_Exp | 0.730 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | | |
| (3) ln_GDP_Imp | 0.036 | 0.035 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | | |
| (4) ln_Popn_Exp | 0.934 | 0.793 | 0.036 | 1.000 | | | | | | | | | | | | | | | | | | | | | | | |
| (5) ln_Popn_Imp | 0.036 | 0.041 | 0.703 | 0.041 | 1.000 | | | | | | | | | | | | | | | | | | | | | | |
| (6) ln_Distance | 0.002 | -0.001 | -0.030 | -0.001 | -0.186 | 1.000 | | | | | | | | | | | | | | | | | | | | | |
| (7) Contingency | -0.001 | 0.000 | 0.204 | 0.000 | 0.308 | -0.582 | 1.000 | | | | | | | | | | | | | | | | | | | | |
| (8) Com. colony | 0.005 | 0.000 | 0.010 | 0.000 | -0.026 | -0.202 | 0.194 | 1.000 | | | | | | | | | | | | | | | | | | | |
| (9) Com. language | 0.004 | 0.000 | 0.064 | 0.000 | 0.029 | -0.291 | 0.120 | 0.728 | 1.000 | | | | | | | | | | | | | | | | | | |
| (10) LPI_Exp | -0.607 | -0.510 | -0.019 | -0.468 | -0.015 | -0.006 | 0.003 | -0.012 | -0.010 | 1.000 | | | | | | | | | | | | | | | | | |
| (11) LPI_Imp | -0.008 | -0.001 | 0.387 | 0.003 | 0.246 | 0.024 | 0.083 | -0.075 | 0.122 | 0.037 | 1.000 | | | | | | | | | | | | | | | | |
| (12) Road_Exp | 0.502 | 0.687 | 0.023 | 0.670 | 0.032 | -0.004 | 0.002 | -0.007 | -0.005 | 0.218 | 0.014 | 1.000 | | | | | | | | | | | | | | | |
| (13) Road_Imp | -0.014 | -0.009 | -0.006 | -0.010 | -0.291 | -0.119 | 0.149 | 0.175 | 0.409 | 0.020 | 0.470 | 0.006 | 1.000 | | | | | | | | | | | | | | |
| (14) Railway_Exp | 0.667 | 0.733 | 0.033 | 0.740 | 0.034 | -0.003 | 0.001 | -0.005 | -0.004 | 0.101 | 0.019 | 0.777 | -0.007 | 1.000 | | | | | | | | | | | | | |
| (15) Railway_Imp | 0.132 | 0.146 | 0.229 | 0.143 | -0.174 | 0.041 | -0.006 | -0.109 | 0.101 | -0.035 | 0.452 | 0.129 | 0.706 | 0.122 | 1.000 | | | | | | | | | | | | |
| (16) Water_Exp | -0.570 | -0.754 | -0.025 | -0.744 | -0.038 | 0.002 | -0.001 | 0.006 | 0.005 | -0.022 | -0.015 | -0.957 | -0.001 | -0.752 | -0.132 | 1.000 | | | | | | | | | | | |
| (17) Water_Imp | -0.139 | -0.167 | 0.113 | -0.165 | -0.165 | 0.217 | -0.051 | -0.006 | 0.106 | 0.045 | 0.399 | -0.169 | 0.604 | -0.156 | 0.511 | 0.183 | 1.000 | | | | | | | | | | |
| (18) Air_Exp | -0.621 | -0.769 | -0.026 | -0.765 | -0.038 | 0.001 | -0.001 | 0.003 | 0.003 | 0.128 | -0.016 | -0.793 | 0.001 | -0.804 | -0.130 | 0.778 | 0.184 | 1.000 | | | | | | | | | |
| (19) Air_Imp | -0.065 | -0.085 | 0.330 | -0.086 | 0.030 | -0.026 | 0.090 | -0.077 | 0.133 | 0.027 | 0.589 | -0.101 | 0.731 | -0.094 | 0.595 | 0.122 | 0.725 | 0.127 | 1.000 | | | | | | | | |
| (20) Innovation_EXP | -0.566 | -0.582 | -0.014 | -0.579 | -0.015 | 0.000 | 0.001 | -0.005 | -0.004 | 0.662 | 0.020 | -0.112 | -0.004 | -0.021 | -0.080 | 0.093 | 0.053 | 0.101 | -0.014 | 1.000 | | | | | | | |
| (21) Innovation_Imp | -0.257 | -0.259 | 0.185 | -0.261 | -0.209 | 0.041 | 0.028 | 0.121 | 0.312 | 0.161 | 0.514 | -0.099 | 0.571 | -0.121 | 0.553 | 0.108 | 0.540 | 0.109 | 0.606 | 0.256 | 1.000 | | | | | | |
| (22) Avail_Latest_Tech_Exp | -0.764 | -0.778 | -0.035 | -0.798 | -0.040 | 0.002 | -0.001 | 0.004 | 0.003 | 0.105 | -0.020 | -0.844 | 0.008 | -0.704 | -0.130 | 0.706 | 0.179 | 0.704 | 0.114 | 0.239 | 0.176 | 1.000 | | | | | |
| (23) Avail_Latest_Tech_Imp | -0.158 | -0.172 | 0.216 | -0.172 | -0.112 | 0.023 | 0.129 | 0.045 | 0.167 | 0.044 | 0.523 | -0.154 | 0.661 | -0.154 | 0.468 | 0.162 | 0.684 | 0.164 | 0.775 | 0.079 | 0.651 | 0.173 | 1.000 | | | | |
| (24) Tech_Readiness_Exp | 0.184 | -0.001 | -0.006 | -0.041 | -0.012 | 0.003 | -0.002 | 0.009 | 0.007 | -0.297 | -0.044 | -0.292 | 0.005 | -0.290 | 0.013 | 0.418 | 0.054 | 0.438 | 0.087 | -0.567 | -0.114 | 0.375 | 0.017 | 1.000 | | | |
| (25) Tech_Readiness_Imp | 0.092 | 0.088 | 0.288 | 0.088 | -0.175 | 0.192 | 0.004 | 0.101 | 0.147 | -0.025 | 0.584 | 0.057 | 0.631 | 0.065 | 0.608 | -0.050 | 0.632 | -0.049 | 0.731 | -0.081 | 0.654 | -0.069 | 0.800 | 0.048 | 1.000 | | |
| (26) Internet Usage_Exp | 0.802 | 0.755 | 0.035 | 0.758 | 0.040 | -0.001 | 0.000 | 0.000 | 0.000 | -0.271 | 0.005 | 0.705 | -0.007 | 0.756 | 0.151 | -0.743 | -0.175 | -0.746 | -0.093 | -0.458 | -0.229 | -0.737 | -0.181 | -0.044 | 0.089 | 1.000 | |
| (27) Internet Usage_Imp | 0.284 | 0.308 | 0.322 | 0.312 | -0.121 | 0.189 | -0.063 | 0.102 | 0.067 | -0.058 | 0.480 | 0.268 | 0.466 | 0.291 | 0.607 | -0.278 | 0.419 | -0.275 | 0.493 | -0.139 | 0.492 | -0.316 | 0.513 | -0.036 | 0.796 | 0.324 | 1.000 |

*Source: Author's Own Computation.*

## Table A.2: Ordinary Least Squares Estimation Results of the Gravity Model

| Dependent Variable: Exports | Estimation Technique: OLS | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| ln_GDP_Exp | 2.395e+11 | 1.1993e+11*** | 8.94621e+11*** |
| | (1.35) | (1.65) | (1.86) |
| ln_GDP_Imp | 2433560.8 | -291463.8 | 2352477.7 |
| | (0.08) | (-0.01) | (0.12) |
| ln_Popn_Exp | 6.0397e+11** | 5.4229e+11*** | 3.0298e+11*** |
| | (2.71) | (4.75) | (4.25) |
| ln_Popn_Imp | -4.2015 | 4.6827 | -8.0860 |
| | (-0.13) | (0.21) | (-0.44) |
| ln_Distance | -9.9508 | -8.8544 | -5.3997 |
| | (-0.18) | (-0.21) | (-0.20) |
| Contingency | 8.4010 | 1.3229 | 1.8835 |
| | (0.07) | (0.20) | (0.35) |
| Com. colony | 1.2769 | 2.0750 | 6.9734 |
| | (0.15) | (0.51) | (0.23) |
| Com. language | 1.2385 | 2.25851 | 6.0768 |
| | (0.15) | (0.50) | (0.17) |
| LPI_Exp | 1.182e+11*** | | |
| | (7.55) | | |
| LPI_Imp | 2.3430 | | |
| | (0.25) | | |
| Road_Exp | | 8.4398** | |
| | | (2.78) | |
| Road_Imp | | 3.3854 | |
| | | (0.11) | |
| Railway_Exp | | 6.880e+11*** | |
| | | (1.41) | |
| Railway_Imp | | 1.307 | |
| | | (0.45) | |
| Water_Exp | | 4.556e+11*** | |
| | | (1.96) | |
| Water_Imp | | -10429828.4 | |
| | | (-0.45) | |
| Air_Exp | | -4.613e+11*** | |
| | | (-1.57) | |
| Air_Imp | | 6386632.8 | |
| | | (0.19) | |

| Dependent Variable: Exports | Estimation Technique: OLS | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Innovation_EXP | | | 1.9280*** |
| | | | (2.11) |
| Innovation_Imp | | | 2.4782 |
| | | | (0.67) |
| Avail_Latest_Tech_Exp | | | 3.304e+11*** |
| | | | (6.25) |
| Avail_Latest_Tech_Imp | | | -7.5628 |
| | | | (-0.26) |
| Tech_Readiness_Exp | | | 6.753e+11*** |
| | | | (12.35) |
| Tech_Readiness_Imp | | | -3.8618 |
| | | | (-0.01) |
| Internet Usage_Exp | | | 1.1736 |
| | | | (0.44) |
| Internet Usage_Imp | | | -5.7835 |
| | | | (-0.49) |
| Constant | -1.5526e+11*** | -2.0199e+11*** | -3.4664e+11*** |
| | (-2.61) | (-2.34) | (-3.89) |
| Pseudo R-Squared | 0.881 | 0.972 | 0.982 |

*Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

Source: Author's Own Computation.

**Table A3: Comparative analysis of LPI across regions**

| | Overall LPI | | Customs | | Infrastructure | | International shipments | | Logistics quality & competence | | Tracking and tracing | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Score | Rank | Score | Rank | Score | Rank | Score | Rank | Score | Rank | Score | Rank |
| N. America | 3.6 | 28.3 | 3.4 | 27.0 | 3.5 | 28.3 | 3.3 | 34.7 | 3.6 | 27.3 | 2.8 | 86.6 |
| Europe | 3.3 | 42.6 | 3.1 | 45.0 | 3.2 | 45.1 | 3.2 | 45.0 | 3.3 | 43.1 | 3.4 | 46.4 |
| Middle East | 2.9 | 73.1 | 2.6 | 75.9 | 2.9 | 63.0 | 2.9 | 76.9 | 2.8 | 75.5 | 2.9 | 77.2 |
| Asia | 2.9 | 78.2 | 2.7 | 79.3 | 2.8 | 79.2 | 2.8 | 80.8 | 2.8 | 77.6 | 2.9 | 77.5 |
| Oceanic | 2.9 | 83.6 | 3.0 | 57.8 | 2.9 | 78.4 | 2.6 | 101.6 | 2.9 | 76.2 | 2.9 | 86.4 |
| S. America | 2.7 | 93.3 | 2.5 | 94.9 | 2.5 | 96.1 | 2.7 | 91.0 | 2.6 | 95.2 | 2.7 | 94.3 |
| Uganda | 2.6 | 102.0 | 2.6 | 76.0 | 2.2 | 124.0 | 2.8 | 78.0 | 2.5 | 99.0 | 2.4 | 123.0 |
| Africa | 2.5 | 116.0 | 2.3 | 114.4 | 2.2 | 115.1 | 2.5 | 109.6 | 2.4 | 115.1 | 2.5 | 110.8 |

Data source: Arvis Jean-François *et al*, (2018) World Bank

**Table A4: Key Informants**

| S/N | Institution | Designation |
|---|---|---|
| 1 | Federation of Small and Medium Enterprises (FSMEs) | Executive Director |
| 2 | Makerere University Business School | School of Economics |
| 3 | Makerere University, School of Economics | School of Economics |
| 4 | Uganda Development Corporation (UDC) | Manager Research, M& Evaluation UDC |
| 5 | United Nations Development Program (UNDP) | Program officer |
| 6 | The South Eastern African Trade and Information and Negotiation Institute (SEATINI) | Programs and Communications Manager. |
| 7 | The South Eastern African Trade and Information and Negotiation Institute (SEATINI) | Program officer |
| 8 | Uganda Manufacturers Association (UMA) | Manager Research and Policy |
| 9 | Uganda Export Promotions Boards | Senior Trade and Information Executive |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