BOOK OF ABSTRACTS
THE NATIONAL UNIVERSITY OF LESOTHO – WORLD TRADE ORGANIZATION (NUL-WTO) RESEARCH CHAIRS' 3rd ANNUAL CONFERENCE

THEME
BRIDGING BORDERS: TECHNOLOGY, TRADE, AND AFRICA'S RENAISSANCE
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PREFACE

Technology and International trade constitute two key goals of the 2030 United Nations Sustainable Development Goals (SDGs). The need to advance technological infrastructure and promote international trade and global partnership are adequately captured by the 9th and 17th SDGs. More importantly, sub-targets of these goals clearly show the bi-causal relationship between improving technology and advancing international trade. On one hand, investments in technological infrastructure can improve access to information, the processing of raw materials to semi-finished and finished products, improved access to markets, enhanced payment systems, increased human capital, the efficiency of global value chains and may promote productivity and efficiency; ultimately promoting trade and development. Further, open markets with enhanced trade facilitation, could boost technological transfer from high-skilled to lower-skilled countries which may, in turn, improve the technological capacity of the recipient countries and ultimately advance economic growth and development. The interconnectedness of technology and international trade has been rapidly increasing in recent years, but the extent to which Africa is prepared for this, or challenged by it, remains relatively unclear.

The 2018 World Trade Report posited that, though trade has always been shaped by technology, the rapid development of digital technologies, such as the Internet of Things, artificial intelligence, 3D printing and Blockchain etc, has the potential to transform international trade profoundly in the years to come.[1] There is no doubt that the speedy development of technologies, in general, and the Information and Computer Technology (ICT) in particular, is rapidly changing and shaping the way that we work and trade; creating opportunities but also risks. Given the competitive nature of international trade, and the already wide divide between countries in terms of trade gains, the African continent risks being worse-off due to their relatively lower technological infrastructure and tech-inclined human capacity. Additionally, their dependence on the fundamental technological infrastructure, makes African economies and the make-up of their tech infrastructure open to all kinds of shocks. Other potential threats can come from the rise of digital trade, e-commerce and AI on intellectual property rights and tax capabilities; data governance and privacy; supply chain diversification and standards and technical regulations etc.

However, opportunities abound. One clear example is that of the increased regional and global value chains. Efficient value chains, thanks to technology, can increase the opportunities for African countries to plug into smaller units of global/regional value chains and produce those goods or services where they have a comparative advantage while equally enjoying proceeds from global/regional sales. Further, technology could be leveraged to rapidly facilitate the realisation and the implementation of the African Continental Free Trade Area (AfCFTA) for increased trade and development in Africa. The AfCFTA promises to be the largest free trade area in the world, connecting 1.3 billion people across 55 countries with a combined gross domestic product (GDP) valued at US$3.4 trillion. According to the World Bank, the implementation of the AfCFTA will significantly facilitate

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[1] World Trade Report (2018). https://www.wto.org/english/res_e/publications_e/world_trade_report18_e.pdf

international trade, lift 30 million Africans out of extreme poverty and boost the incomes of nearly 68 million others who currently live on less than $5.50 a day; boost Africa's income by $450 billion by 2035; and increase Africa's exports by $560 billion[2]. In addition, one of the key drivers of the African Union Agenda 2063 is to promote science, technology and innovation among member states.

The 3ʳᵈ annual conference of the WTO research chair of the National University of Lesotho entertained 20 technical papers that were selected through a rigorous and competitive process from a pool of 98 abstracts submitted. The conference was held between the 10ᵗʰ and the 11ᵗʰ of October 2024 and attracted international participants from across Africa and indeed the world. The chair also sponsored 3 conference participants for a physical presentation from Zimbabwe and Eswatini. The conference proceedings incorporates all 20 papers that were finally presented in the conference and is grouped into 6 sections thus: ICT and Trade Outcomes; Blockchain Technology, AI and Trade Outcomes; Human Capital, ICT Development and International Trade Outcomes; Regulatory Frameworks, Digitial Governance and International Trade Outcomes; Climate Variability, Technology and Trade; and Digital Technology, Regional Integration and International Trade Outcomes.

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[2] World Bank (2020). The AfCFTA. https://www.worldbank.org/en/topic/trade/publication

ACKOWLEDGEMENTS

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EXTRACT OF KEY NOTE PAPER

Bridging Borders: Technology, Trade, and Africa's Renaissance

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1.0   Introduction

Artificial intelligence is one of the rapidly evolving technologies. AI presents wide-ranging opportunities, including the ability to drive economic growth, social progress, and cultural renaissance. There are many projections of the benefits of AI for developed countries, but definite projections are yet to be made for developing countries. It is estimated that generative AI could increase productivity by 40% and add between US$2.2 and US$4.4 trillion annually to the global economy (Chui, 2023). If Africa can recoup 5% of this opportunity, generative AI could add between US$110 and US$220 billion to African GDP a year (African Union, 2024). Based on this, the marginal economic benefit will be high.

Africa's demographic dynamics (at least 1.2 billion people according to the United Nations) and its size - 54 states, makes it a huge potential market for trade. However, according to WTO data, since 1995, Africa's share of the world trade has not exceeded 5%. In fact, its share has declined considerably in recent years, from 4% in 1970 to 2.1% in 2020 (World Trade Organisation, 2021). Africa's weak trade performance is largely attributable to the growth and level of development of African economies, the fall in commodity prices, the business environment, and the quality of infrastructure and institutions (Njinkeu, Wilson, & Fosso, 2008). Indeed, Africa's current trade infrastructure is not suitable to deal with the challenges of international trade (Daniel Sakyi, 2019). International trade is competitive; however, as it relates to trade gains, there is a vast divide between African countries and other nations, particularly developed countries. To a certain degree, Africa's economic development depends on reducing its trade transaction costs. Technology can help reduce the cost.

The broad benefits of AI where it is carefully applied and implemented considering Africa's context is that AI will play a critical role in fostering industrialisation, providing faster access to health and

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education, better government services, and jobs. AI can also be important in managing the climate crisis, saving lives, and reducing the cost of droughts, cyclones, and wildfires (African Union, 2024). With respect to trade in Africa, AI can drive greater productivity, enable better supply chain management, and lower trade costs (Janos Ferencz, 2022). Conversely, trade is an avenue through which African countries can access the components needed to build AI systems and through which they can deploy AI solutions globally (Janos Ferencz, 2022).

In spite of the numerous benefits of AI and its ability to drive innovation and economic growth in Africa, there are several challenges that can hinder Africa from fully maximising the benefits of AI. There are data regulation challenges as well as infrastructural challenges. Apart from the peculiar challenges Africa faces with digital technologies like AI, there are also risks of AI, including threats of job losses due to automation, bias and discrimination, lack of AI transparency and explainability, social surveillance with AI technology, lack of data privacy using AI tools, socioeconomic inequality as a result of AI, threat of autonomous weapons powered by AI, loss of human influence, increased criminal activity, and broader economic and political instability (Thomas, 2024).

The address is structured as follows: After this introduction, the next section considers the relationship between AI and trade, that is, how can AI help international trade in Africa, and how can trade impact AI? The paper then considers some provisions in RTAs and emerging digital trade agreements relevant to AI systems and how AI can enhance policy-making in Africa. The paper then considers the challenges/problems of AI in Africa. Then, the address suggests how AI can be maximised in international trade in Africa. The final section is the recommendations and conclusion.

2.   AI and International Trade

AI can be defined as a computer performing human-like tasks (Joiner, 2018). Broadly, AI is "a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments (OECD Legal Instruments, 2024). AI systems are designed to operate with varying levels of autonomy". AI is also widely considered to be a general-purpose technology with a strong potential to spur innovation, help firms create new value from data, and reduce trade costs (Avi Goldfarb, 2018). Generative Artificial Intelligence (GAI) is a relatively recent subfield within AI that focuses on developing algorithms to generate new content based on a set of training data (Stefan Feuerriegel, 2023). AI has broad implications across all aspects of society, including the way it is reshaping the economy, national security, and international trade. In 2020, AI was projected to add an estimated $15 trillion to the global economy by 2030 (International Trade Administration US, n.d.). The global AI market is projected to grow from an estimated $157 billion in 2020 to about $300 billion in 2024 (International Trade Administration US, n.d.). There are even more robust projections of generative AI and its contribution to the global economy, which Africa can tap into.

The traditional view of trade policy and AI is that policy should generally be separated from technological advancement (International Institute for Sustainable Development, 2023). As such, technology can result in high productivity, where trade barriers are reduced. The Organisation of Economic Co-operation and Development (OECD) recommends that for AI and trade, there should

be additional liberalisation of information and communication technology goods trade; lowering barriers to digital services trade; facilitating mode 4 delivery of services (presence of natural persons); and harmonising data flow regulation (International Institute for Sustainable Development, 2023). These policies can help in increasing AI technology in international trade.

2.1 International Trade Regulation and AI – Some Policy Considerations

2.1.1 Goods – Services Distinction

AI brings to the fore the problem of goods-services distribution, which is a problem for digital goods. The World Trade Organisation (WTO) had set out rules to determine whether a product is a good or service. Yet, the WTO's work program set to answer the question more definitively is still being negotiated after 25 years (International Institute for Sustainable Development, 2023). With AI, it is important to determine whether General Agreement on Tariffs and Trade or General Agreement on Trade in Services (GATS) commitments dictate. The current rules are fragmented, which will end up boosting the costs of trade.

Classifying AI as a service raises some issues. Under GATS, the market access commitment for some professions (law, accounting and medicine) require some certification or legal personhood. This raises the question of whether trained systems like Chat GPT will be covered by the GATS commitment. In a similar fashion, where GATS commitments are based on legal personhood – are AI systems excluded? (International Institute for Sustainable Development, 2023).

2.1.2 Barriers in Trade in Goods

To drive the deployment of AI systems, it will be necessary to ease the barriers in trade in goods since ICT goods are the most highly traded (Janos Ferencz, 2022). Tariffs imposed on borders can increase costs and discourage AI adoption because to successfully develop, deploy and implement AI systems, hardware is required, e.g. high-performance computing equipment, network equipment communication units. Tariff rates vary across regions but are highest in developing countries, many of which do not participate in the WTO Information Technology Agreement (ITA) (Janos Ferencz, 2022). This is an obstacle to these countries' adoption of AI technologies via trade and developing their own AI capacity. Since African countries can leverage AI for development, removing this obstacle becomes essential (International Finance Corporation, World Bank Group, 2020).

2.1.3 Modes of Delivery under GATS

Existing services commitments under the WTO General Agreement on Trade in Services (GATS) apply in a technologically neutral way, meaning that such commitments would be relevant when AI solutions are used for service provision (Janos Ferencz, 2022). However, with respect to generative AI, the modes of delivery under GATS which include – cross border, consumption abroad, commercial presence, and the presence of natural resources are not well adapted to AI embedded products (International Institute for Sustainable Development, 2023). Market access issues for services trade will arise, even though services trade should not be subject to tariffs under GATS. Tariffs are allocated to services embedded into goods because the value of services is included in the cost of the final product. In this context, calls have been made to add a 5th mode of services delivery,

supposed to help capture the services content embodied in goods export (International Institute for Sustainable Development, 2023). This suggestion has not, however been tried at the WTO.

In this context, lowering trade restrictions for services for AI systems will be necessary. Creating an enabling trade regulatory environment in Africa that facilitates market access and foreign investment related to new technologies will limit unnecessary barriers to the uptake and use of AI. It will safeguard competition and a level playing field in the market, helping to accelerate the adoption of AI (Janos Ferencz, 2022).

2.1.4   Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement and AI

There are questions about whether the TRIPS Agreement is capable of protecting AI-generated works like graphics, poetry and music since there is no clear definition of how to deal with AI-generated works. Yet, these all fall within the legal aspects of intellectual property rights (IPR). Given that the copyright system is closely connected with human creativity and considers the human creative process, the question becomes whether copyright should be attributed to original literary and artistic works autonomously generated by AI or whether a human creator is required (Alexandra George, 2022). Given the limited provision of TRIPS on AI generated works individual members have different approaches in their domestic legislation, from full protection of AI-generated work to a requirement for human creativity, which means that there is no protection for those works (International Institute for Sustainable Development, 2023). African countries already have fragmented laws so there will need to be some serious considerations of how AI generated content will be regulated advisably on a regional or global level.

3.0   International Trade and AI in Africa

AI is revolutionising various aspects of international trade by transforming traditional and manual methods and trade practices. Yet, the swift adoption and rapid integration of AI in Africa might outpace Africa's ability to adapt effectively, leading to disruptions, including challenges in the labour market, the education system, public discourse, and various mental health concerns (Pegah Maham, 2023). Globally, AI discussions have generally been concerned with shared values, ethical guidelines and safety. Governments, apart from African governments, have been rapidly implementing these principles nationally, leading to fragmented and divergent requirements. In Africa, there are already fragmented laws and regulations in data governance, which is a critical aspect of AI. Thus, whilst African countries are not yet on board with the rapid adoption of AI policies and strategies, there are still problems with fragmented legislation, particularly in the data governance space.

Africa can harness AI's transformative benefits to drive its development goals. Its youthful population, increased adoption of digital technologies, and growing innovation ecosystems offer opportunities for AI to play a role in its economic development. However, AI's benefits will elude Africa if systemic challenges, including infrastructural deficits, data management issues, and insufficient governance frameworks, are not addressed. (Botho Emerging Markets Group, 2024). The Oxford University Press Readiness Index (Oxford Insights, 2019). which assesses the preparedness of a country to integrate and leverage AI, finds that African countries lag behind other countries in AI readiness.

3.1 How can AI help International Trade in Africa?

Even with its limitations, AI is rapidly evolving and can enhance international trade in Africa in several ways

3.1.1 Optimising Supply Chain

Amongst other supply chain challenges in Africa, including government policies and poor transport infrastructure, there are IT challenges that are still relatively manual-based and static. AI can improve supply chain efficiency in Africa by streamlining and automating smart manufacturing. AI can optimise and streamline the complex networks in supply chain management. AI can help reduce lead times, minimise costs and enhance overall efficiency in moving goods across African borders.

3.1.2 Logistics

In Africa, the small population in rural areas and the lack of adequate road infrastructure can leave the majority of the population disconnected from supply chains. AI can help by improving efficiency across supply chains, tracking the movement of parcels to see if they reach rural areas, and optimising warehouse usage in Africa by predicting demand and organising inventories.

3.1.3 Trade Facilitation and Compliance

Trade facilitation is the simplification and harmonisation of international trade procedures. These procedures include the 'activities, practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade'. In Africa, the challenges of trade facilitation include manual inspections and paper-based documentation to verify the compliance of imported and exported goods. However, AI technologies such as machine learning and natural language processing can automate and expedite these processes. AI-powered systems can analyse documents, detect anomalies, and flag potential risks, enabling faster and more accurate customs clearance. This will not only improve the efficiency of international trade in Africa but also enhance security and compliance measures.

3.1.4 Customs

In Africa, many businesses have the challenge of knowing the requirements related to customs procedures and duties. AI can be used to read and understand descriptions of commercial goods and classify these against customs codes in the Harmonised System to help companies identify requirements related to customs procedures and duties (Banker, 2017). AI is also increasingly used to identify counterfeited products (International Trade Administration US, n.d.).

3.1.5 Market Intelligence and Trade Opportunities

AI-driven market intelligence tools can empower African businesses to make informed decisions and identify trade opportunities. This is especially useful for SMEs in Africa. AI algorithms can identify emerging trends, consumer preferences, and market demands by analysing vast amounts of data from various sources, including trade databases, market reports, and social media. This will enable African businesses to develop targeted marketing strategies, identify new export markets, and adapt their product offerings to meet specific customer needs. AI-powered market intelligence tools can provide

African businesses with valuable insights that can significantly make them more competitive in the global marketplace.

3.1.6   Risk Assessment and Fraud Detection

International trade involves inherent risks, including fraud, counterfeiting, and illicit activities. These risks are magnified in Africa. AI technologies can mitigate these risks by enhancing risk assessment and fraud detection capabilities. AI algorithms can analyse transaction data, financial records, and shipping information to identify suspicious patterns or anomalies that may indicate fraudulent activities. This enables customs authorities and businesses to take proactive measures to prevent illicit trade and protect intellectual property rights. All of this can make international trade safer and more streamlined.

3.2   Challenges of Adopting AI in Africa include

3.2.1   General AI Risks

Adopting AI can result in a reduction of trust in human engagement due to misinformation. Ensuring robust transparency and security standards would be essential in addressing this issue. A Europol study estimates that by 2026, 90% of online content could be generated by GAI. Moreover, GAI image generation is becoming overwhelmingly convincing. In a German study, only 8% of respondents could correctly identify a photo of a real human face when lined up against 3 GAI-generated images.

3.2.2   Infrastructural Inadequacies

Africa's readiness gap in the Oxford Index is more evident in the Data and Infrastructure Pillar (Oxford Insights, 2019). Infrastructural inadequacies include frequent electricity disruptions and inconsistent internet connectivity. These inadequacies undercut the basic support necessary for the implementation of AI. Given that AI-driven solutions require a continuous flow of data and consistent connectivity, Africa will need to invest in reliable power and internet connectivity for the basic operation of AI-driven solutions and AI research and development. (Botho Emerging Markets Group, 2024).

3.2.3   Structural Inequalities

Many African countries fall within the least developed status, meaning they have a significantly lower level of access to socio-economic and political resources such as education, employment, income, ICTs, and healthcare (Emmanuel Ogiemwonyi Arakpogun, 2021). AI uses a range of ICT infrastructure; therefore, both AI users and developers caught in the digital divide will likely miss important opportunities of AI. African countries also lag behind other parts of the world when it comes to digital divides, albeit with varying degrees across regions.

3.2.4   Cybersecurity

Cybersecurity is a challenge that will affect the adoption of AI in Africa. As AI is increasingly being used in Africa, there are concerns about the security of sensitive information, such as personal data, financial transactions, and critical infrastructure.

3.2.5 Governance and Regulation

Given the pace at which AI is evolving, African governments will face new regulatory challenges. AI regulation is increasingly becoming complex and challenging, especially for African governments (Marijn Janssen, 2020). The tendency for regulation to become obsolete quickly is high. Such challenges will require a higher degree of institutional capacity, which is disproportionately lacking in African countries, along with a fragile legal and regulatory framework (Akwagyiram, 2018).

4.0 How can AI be maximised in International Trade in Africa?

4.1 Building Institutional Capacity in AI Regulation

AI is evolving rapidly and is increasingly becoming complex and challenging for African regulators to keep up with. Lack of institutional capacity has unintended consequences, especially in Africa, because the government is unable to guarantee citizens' privacy and security. Moreover, there are increased risks of cybersecurity attacks. To fully harness the benefits of AI, African governments and institutions will need to build capacity in AI regulation to meet the complexities and challenges of the ever-evolving regulatory landscape. Africans can adopt an approach to regulation that is problem-driven, where local needs and problems are considered and made a key part of the policy formulation. This approach would result in AI policy in Africa going beyond institutional form (how policy should look like) to institutional function (what policy should actually do) (Lant Pritchett, 2012). African governments will be able to frame robust AI policies that are relevant to their distinctive circumstances.

4.2 Harmonisation of Laws

It is recognised that there are no universal or agreed-upon approaches to regulating AI because inherent questions of privacy and morality that differ in different jurisdictions are inherent in AI. With respect to trade liberalisation, there are divergent national interests. Yet, harmonising AI regulation in Africa is crucial to reducing compliance costs. Soft laws can help in this regard. For instance, the AU Data Policy Framework for the continent seeks to "create a consolidated data environment and harmonised digital data governance system to enable the free and secure flow of data across the continent while safeguarding human rights, upholding security and ensuring equitable access and sharing of benefits" (African Union, 2022).

4.3 Data Managemen

tIn Africa, there is a scarcity of robust and accurate data sets, resulting from historical data that has not been digitised and inaccuracies in existing data. These constraints are hindrances to technological advancement, especially AI. Yet, Africa's diverse culture, language and ethnicity can be a wealth of data resources. African governments and institutions must develop strategies to digitise and leverage this data. African governments must ensure that exploitation by big tech firms does not undermine their data sovereignty. This often happens due to Africa's fragmented and weak data protection laws.

4.4 Addressing Infrastructure and Skills Gap

To boost trade in Africa using AI, Africa's infrastructure gap has to be addressed. Limited access to electricity and internet connectivity are fundamental infrastructural challenges. Without a stable and consistent power supply and a strong telecommunications network, the benefits of AI will not be fully utilised. Furthermore, the high cost of technology, when compared to the low average income of Africans, makes it difficult to afford expensive technological devices. This creates a digital divide.

5.0 Conclusion

The opportunities that AI presents for international trade are significant. Conversely trade has positive effects on AI. In Africa, AI can enhance international trade by optimising supply chain, enhancing logistics, automating trade facilitation and compliance processes, streamline customs processes, providing market intelligence and opportunities as well as risk assessment and fraud deterrence which are particularly prevalent in Africa. However, in adopting AI for international trade in Africa, there are some policy considerations that would need to be addressed. There is a need to clarify the law where AI is classified as a service. Tariffs prevalent in developing countries, including African countries need to be removed in order to faciliatte the adoption of AI. With Generative AI, the inclusion of a fifth mode of delivery may be considered, given that the current four modes of delivery are not well adapted to AI-embedded products. There is a need to lower trade restrictions for services for AI systems in Africa. Given the fragmented nature of the copyright laws in Africa, harmonisation will be necessary.

For Africa to fully harness the benefits of AI, infrastructural challenges, structural inequalities, governence and regulation issues as well as core challenges of AI (ethical issues) need to be addressed. In Africa, there has to be context-specific discussions to address the ethical and political challenges of AI and international trade. Such discussions will bring about the adoption of a problem driven approach which considers Africa's problems and needs in the policy formulation.

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I.   ICT AND TRADE OUTCOMES

I.I Bridging Borders: Information and Communication Technology and International Trade Outcomes in Lesotho

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Abstract

International trade thrives on the flow of information, which is increasingly, greatly determined by the strength and performance of the Information and Communication Technology (ICT). ICT has the potential to ease communication, reduce trade logistics, reduce transaction costs, and increase trade in services etc. Though the majority of the global community has advanced in the ICT infrastructure and is now metamorphosing into the internet of things and artificial intelligence, Africa is still backward in basic ICT infrastructure such as access to the internet and ownership of functional websites. Lesotho in particular, is a compelling case study. Being a least developed landlocked country with over 4 decades of negative net-exports; it is interesting to ascertain the extent to which ICT has affected international trade in Lesotho. Nevertheless, empirical evidence on the subject is non-existent for Lesotho. The study investigates the extent to which, internet access and website ownership of firms have affected international trade participation and outcomes. The study employed the 2023 National University of Lesotho – World Trade Organisation (NUL-WTO) survey data for its analysis. The study employs probit, tobit and multivariate regression model to analyse the specific objectives. The findings show that, internet access and website ownership do not significantly affect international trade participation and international trade outcome. The study proposes the need for massive sensitisation of the use of the internet and owning a website by firms and recommends the regulatory bodies to host a multi-vendor marketplace that could host all firms.

Keywords: ICT, International Trade Participation, International Trade Outcomes, Website Ownership, Exports, Lesotho

I.II How has ICT investment and utilisation translated to ICT Service Exports in Africa?

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Abstract
One of the greatest potentials of using the internet, especially for Africa, is its ability to break barriers and improve access to international markets. This is more relevant for the service sector where transactions can be done and concluded from anywhere without the business constraints commonly faced by regular businesses in Africa, such as poor road networks, government bureaucratic bottle necks, access to finance etc. Nevertheless, though individuals using the internet in Sub-Saharan Africa (SSA) have increased by 1700% in the last 2 decades, exports of ICT goods and services have remained very low. It is on this premise that this study seeks to understand the extent to which ICT investment and utilisation translated to ICT service exports in Africa, especially given the rapidly increasing use of ICT by Africans. The study employs the system General Method of Moments (s-GMM) econometric model, fixed effect panel model and a pooled regression to analyse a panel of 41 SSA countries spanning 2015 to 2022. The study finds that, while ICT investment significantly and positively impacts on ICT service exports, internet use is not a significant determinant of ICT service export. The study therefore recommends SSA governments to increase the number of digital infrastructure, offer tax incentives or subsidies for investors in digital infrastructure, invest in STEM education and massive digital literacy campaigns, provide export financing, low-interest loans or establish specialised funding programs for ICT exporting start-ups to scale up operations and enter foreign markets. Also, SSA governments could harmonise digital trade policies with trading partners, ensure that data protection laws align with global standards to facilitate trust in cross-border data flow and reduce barriers to entry for firms looking to participate in global digital markets.

Keywords: ICT investment, ICT utilisation, ICT Service Exports, Africa

II.   BLOCKCHAIN TECHNOLOGY, AI AND TRADE OUTCOMES

II.I Blockchain Technology for Strengthening Agricultural Value Chains and Trade in Eswatini

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Abstract

The agricultural sector in Eswatini faces numerous challenges, including lack of transparency, traceability, and inefficient transactions across the value chain. These issues hinder the competitiveness of Eswatini's agricultural exports and limit the potential for smallholder farmers to access lucrative markets. This study aimed to investigate the feasibility and impact of implementing blockchain technology to address these problems and strengthen agricultural value chains and trade in Eswatini. Using a mixed-methods approach, the study first conducted in-depth interviews and focus group discussions with key value chain actors, such as smallholder farmers, commercial farmers, input suppliers, processors, transporters, wholesalers, retailers, and exporters. This qualitative phase identified the current pain points and inefficiencies within the agricultural value chains. The findings revealed that blockchain technology has the potential to enhance transparency, traceability, and efficiency across Eswatini's agricultural value chains. However, the study also highlighted the need for targeted capacity building, technological infrastructure development, and supportive policy frameworks to enable the successful integration of blockchain solutions. Based on the results, the researchers recommend that policymakers, industry stakeholders, and development partners collaborate to develop a strategic roadmap for the adoption of blockchain technology in Eswatini's agricultural sector. This could unlock new opportunities for smallholder farmers, increase the competitiveness of Eswatini's agricultural exports, and contribute to the country's sustainable economic growth.

Keywords: Agricultural value chains, Agricultural trade, Blockchain technology, Eswatini, Transparency, Traceability

II.II Blockchain for Agricultural Supply Chains: Legal Prospects and Challenges in Africa

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Abstract

The advent of blockchain technology presents transformative potential for agricultural supply chains, particularly in Africa. This paper aims to analyse the legal status and regulatory approaches to blockchain technology within the agricultural sector, emphasising its ability to enhance traceability, reduce fraud, and facilitate trade. The motivation behind this research stems from the pressing need to improve food safety and supply chain transparency in Africa, where agricultural practices are vital for economic development and food security. The primary research question is: How can legal frameworks in African countries be adapted to support the implementation of blockchain technology in agricultural supply chains? To address this question, the study reviews existing literature on blockchain applications in agriculture, analyse current legal frameworks in selected African countries, and examine case studies where blockchain technology has been successfully implemented. The paper employs a doctrinal legal research methodology, utilising case studies, legal analysis, and expert interviews to gather comprehensive data. The paper also incorporates comparative analysis to highlight best practices and identify gaps in current regulations. The paper finds that the adoption of blockchain technology in African agricultural supply chains offers significant opportunities for improving traceability, reducing fraud, and enhancing food safety. However, to fully realise these benefits, it is essential to address the legal and regulatory challenges identified in this research. By developing comprehensive legal frameworks, promoting regional harmonisation, supporting regulatory innovation, and strengthening data protection laws, African countries can create an enabling environment for blockchain adoption in agriculture. This research has also highlighted the importance of stakeholder engagement and capacity building in ensuring the successful implementation of blockchain technology. By working together, governments, industry stakeholders, and researchers can develop and implement solutions that leverage blockchain's potential to support sustainable and secure agricultural practices in Africa.

Keywords: Blockchain, Agricultural Supply Chains, Legal Prospects, Africa

II.III AI and Inclusive Economic Growth: Integrating Marginalised African Communities into Global Trade Networks

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Abstract

This study explores the transformative potential of Artificial Intelligence (AI) to enhance trade competitiveness and economic inclusion for marginalised African communities within global trade networks. Although AI has revolutionised global markets by increasing efficiency, reducing production costs, and fostering innovation, its benefits are unevenly distributed, particularly disadvantaging many regions in Africa. This disparity perpetuates economic inequalities and obstructs the potential for inclusive growth, particularly in areas characterised by limited technological infrastructure, resource access, and educational opportunities. Employing the Capability Approach as a theoretical framework, the study emphasises equitable access to resources and opportunities to enable individuals and communities to thrive. Methodologically, the research combines thematic and comparative analyses. The thematic analysis offers insights into how AI affects trade networks and economic development by examining qualitative data, while comparative analysis highlights variations in AI adoption across African countries like Nigeria, Kenya, Ghana, Rwanda, South Africa, and Tanzania, revealing both successful strategies and poor outcomes. The study identifies critical barriers to AI integration, including inadequate technological infrastructure, regulatory constraints, and insufficient digital literacy, which hinder AI's effectiveness and exacerbate economic divides. By addressing these challenges, the study fills a crucial gap in the literature on AI's role in integrating marginalised communities into global trade. To facilitate this integration, the research recommends prioritising investment in technological infrastructure, enhancing digital literacy programs, and updating regulatory frameworks. These strategic interventions aim to overcome barriers, ensuring AI's benefits are equitably distributed and promoting an inclusive digital economy in marginalised African communities.

Keywords: AI, Trade Competitiveness, Economic Inclusion, Marginalised African Communities, Technology Infrastructure

II.IV Quantitative Review of IoT Adoption and Supply Chain Efficiency in Five Nigerian Companies

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Abstract
The rapid expansion of the Internet of Things (IoT) is revolutionising industries by enhancing connectivity among people, systems, and objects. With IoT device numbers predicted to rise from 9.7 billion in 2020 to 29 billion by 2030, its integration into supply chain management is increasingly critical, improving transparency, efficiency, and decision-making. This study focuses on evaluating the impact of IoT on supply chain efficiency within five Nigerian companies, a region where IoT's potential remains largely untapped due to infrastructural and technological challenges. The research employed a quantitative methodology, with purposive sampling used to select 50 participants across the 5 selected companies, ensuring a comprehensive assessment of IoT's influence across diverse sectors. A structured questionnaire was distributed online to 10 senior managers from each selected company, collecting data on IoT adoption levels, applications, and impacts on supply chain performance. Data analysis was conducted using IBM SPSS version 27, employing descriptive analysis and regression and correlation tests to examine the relationship between IoT adoption and supply chain metrics. The analysis revealed a significant adoption rate of 74.4% across the companies, with notable enhancements in supply chain metrics. Specifically, a negative correlation coefficient of -0.345 was observed between IoT adoption and lead time, although this was not statistically significant ($p=0.053$). Inventory turnover showed marked improvement, with 60% of companies reporting increased efficiency in inventory management. Order accuracy saw substantial improvements, with 17 out of 43 respondents (39.5%) rating it as significantly enhanced. Despite these positive trends, challenges such as inadequate infrastructure and high implementation costs were significant barriers, affecting the full realisation of IoT benefits. The study concludes that while IoT adoption shows promise in enhancing supply chain operations in Nigeria, the benefits are unevenly realised, largely influenced by existing infrastructural deficits and high initial costs. Recommendations include enhancing digital infrastructure, developing supportive regulatory frameworks, and implementing pilot projects to better integrate IoT solutions tailored to specific operational needs. Investing in local expertise and fostering public-private partnerships are also critical for overcoming barriers to IoT adoption and leveraging its full potential for supply chain enhancement in Nigeria.

Keywords: AI, Inclusive Economic Growth, Marginalised African Communities, Global Trade Networks

III. HUMAN CAPITAL, ICT DEVELOPMENT AND INTERNATIONAL TRADE OUTCOMES

III.I Bridging the Digital Divide: How Education Can Empower Africa in the Global Marketplace

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Abstract

The digital revolution is transforming global trade, demanding a digitally literate workforce. However, a significant gap exists between Africa and developed nations in terms of access to technology and digital skills. This paper investigated how educational institutions and policy can bridge this digital divide and empower African nations to participate effectively in the digital trade landscape. The paper further assessed how closing the digital divide can empower African businesses in e-commerce, international communication, and data analysis. The desk review identified factors contributing to the gap, highlighting the importance of Science, Technology, Engineering, and Mathematics (STEM) education and digital literacy programs, especially for the young population in Africa. It examined the role of educational policy in fostering these initiatives through teacher training, curriculum reform, and infrastructure development. Finally, the paper recommends intensified investment in education and collaboration to create a more equitable and prosperous future for African states in the digital age as they adopt the African Continental Free Trade Area (AfCFTA) Agreement for the achievement of Agenda 2063.

Keywords: Education, e-Commerce, Digital Divide, International trade

III.II Towards Manpower Development and Trade Through Artificial Intelligence in Member Countries of African Continental Free Trade Area: Evidence From Nigeria

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Abstract

Artificial intelligence which is the trending thing all over the globe has not received prior attention with respect to the intersection that exists between it, Manpower Development (MD) and trade within Sub-Saharan Africa and the African Continental Free Trade Area (AfCFTA). This paper will therefore explore the symbiotic relationship between artificial intelligence, human capital development, and trade in AfCFTA by exploring the role of AI in enhancing manpower development and trade in Nigeria. Anchored on systems theory, this paper demonstrated how AI is revolutionising manpower development through enhanced learning systems and workforce training, and how these advancements, in turn influence Africa's trade dynamics in AfCFTA through qualitative research method. Also, the paper critically highlighted the challenges that hinder leveraging AI to foster inclusive economic growth and sustainable development for African countries. The paper shows that AI significantly influences manpower development and trade. For this reason, the application of AI in manpower development and trade should be encouraged through the concerted efforts of AfCFTA member countries in respect of formulating and implementing a common AI policy.

Keywords: Education, Scaling AI Innovations, Qualitative Data Analysis, Qualitative Method, System, Systems Theory

III.III Impact of Cross-Border Paperless Trade and Human Capital Development on Advanced Global Value Chain (GVC) Participation: Implication for Lesotho

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Abstract
This study explores the transformative potential of cross-border paperless trade and human capital development in enhancing Lesotho's participation in advanced Global Value Chains (GVCs). Despite universal participation in GVCs, the most significant gains are limited to countries specialising in advanced manufacturing, services, and innovative activities. Lesotho, as a landlocked country with constrained logistics and trade infrastructure, faces substantial challenges in integrating into high-value GVCs. The study posits that adopting digital technologies to facilitate paperless trade can mitigate these challenges by reducing transaction costs, enhancing transparency, and improving overall trade process efficiency. Given that substantial GVC dividends accrue to actors with innovative capabilities, human capital development in Lesotho can trigger rapid innovation in its dominant sectors, leading to greater GVC participation and significant economic gains. Utilising a mixed-methods approach, this study leverages data from the 2023 National University of Lesotho - World Trade Organisation (NUL-WTO) Chair data repository. An econometrics analysis based on Probit Model assesses the impact of paperless trade and human capital development on GVC participation. Our findings revealed that only import constraints were statistically significant in impacting GVC participation for Lesotho. Given this, the strong impact of import restrictions implies that these obstacles hinder businesses' capacity to take advantage of scale economies, which lowers their competitiveness in international marketplaces. The study identifies several key factors for successful implementation: robust digital infrastructure, comprehensive capacity-building initiatives, and supportive legal and regulatory frameworks. The research concludes with policy recommendations to foster a conducive environment for these initiatives. By embracing both paperless trade and human capital development, Lesotho can enhance its integration into advanced GVCs.

Key Words: Lesotho, Global Value Chain, Human Capital Development, Cross-Border Trade, Import, Export, Trade Facilitation
JEL Classification: O55, O15, F14, F13

III.IV Digitalising Trade: Leveraging Digital Ecosystems for MSMEs in Africa

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Abstract

African economies are sustained by Micro and Small Medium Enterprises (MSMEs) which are primarily owned by women and youth. Ensuring that these MSMEs are included in digital ecosystems and are capacitated to engage in sustainable cross border e-commerce will not only promote the participation of both women and youth in economic activities but it will also advance economic development in Africa. Research has established that Africa has "potential" to become an economically viable continent by engaging in digitally enhanced trade and e-commerce. In light of this, the paper critically examines how Africa can harness this potential to ascertain that digital trade and e-commerce work as bridging borders that accelerate the renaissance of the 'Africa We Want'. The paper starts by introducing the concept of digital trade and e-commerce in Africa and it will also consider taxation policies under this regime. It further provides a theoretical framework upon which the research is based. The heart of the paper discusses the factors that contribute to the inclusion of MSMEs in digital ecosystems such as digital infrastructure, regulatory framework, electronic payment systems, tariffs and non-tariff barriers. The findings establish that digital trade can work if national digital ecosystems of African markets are developed. Further, digital trade can work if the continental, regional and national regulatory framework make it permissible for such trade to prosper. Case studies on a select African countries will be discussed to substantiate such findings. To conclude, the paper references the draft on the AfCFTA Protocol on Digital Trade and how such regulatory framework fosters a conducive environment for the advancement of digital trade across the African continent.

Keywords: Digital Trade, Digital Ecosystems, E-commerce, MSMEs, Africa

IV. REGULATORY FRAMEWORKS, DIGITIAL GOVERNANCE AND INTERNATIONAL TRADE OUTCOMES

IV.I Navigating Legal Complexities: The Regulation of Crypto Assets as Securities under CEMAC Law

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Abstract

The adoption of crypto assets as securities (actifs numerique) in CEMAC in 2022 came as a big surprise to crypto enthusiasts who had to grapple with stringent regulations that banned crypto assets for more than a decade. The rationale for banning crypto related exchanges by national (Cameroon, for example) and community regulators in CEMAC[4] resided in the numerous frauds and scams committed by unlicensed exchanges who defrauded thousands of users through crypto scams. Nonetheless, gleaning from the potential of crypto assets to promote financial inclusion and promote investments in CEMAC, COSUMAF[5] decided to regulate crypto assets and public offerings for investment purposes via a COSUMAF Regulation dated 2022 (the "Regulation"). Licensed Virtual Asset Service Providers (VASP) now have the standing to assist potential clients in listing their tokens on their various platforms for investors to purchase the same and for payments. It emerges from the Regulation that COSUMAF has ascribed the same legal regime applicable to public calls via the traditional stock exchange market to that of digital tokens and that a specific legal regime has not been accorded to digital tokens. Based on desktop research, this paper argues that the specificity of crypto assets offering which, to wit, the underlying technology, risk exposures, presents an added layer of complexity that warrants a special legal attention. We thereby recommend inter-alia that a specific legal instrument should be adopted to render the protection of end users/investors in public offerings of digital tokens more impressive.

Keywords: Crypto Assets, Securities Regulation, CEMAC Law

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[4] CEMAC is the Economic and Monetary Community of Central Africa, created by the CEMAC treaty of March 16, 1994, **N'Djamena, Chad** and made up of six (6) members states; Gabon, Cameroon, the Central African Republic (CAR), Chad, the Republic of the Congo and Equatorial Guinea.

[5] The Central African Financial Market Supervisory Commission (COSUMAF) is the Capital Markets regulatory authority for CEMAC

IV.II Data Governance and Trade Liberalisation in West Africa

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Abstract

It has been observed through the review of the extant literature that limited studies have been undertaken on how the potential of data governance could lead to trade liberalisation in West Africa. However, despite the embedded benefits, the potentials of data governance which could lead to trade liberalisation in West Africa continue to be challenged by inadequate harmonised regulations across countries. This complicates the management of cross-border data flows and trade activities. Aside from this, inadequate infrastructure and cybersecurity measures continue to hinder the secure and efficient handling of data, posing risks to both businesses and consumers while varying levels of digital literacy and technological adoption across the region create disparities that can impede the equitable benefits of trade liberalisation. To bridge these gaps, applying institutional and regime theories, this paper adopted a desktop study approach, synthesising reviews from the available literature and official documents to produce emergent themes. It examined the intersection of data governance and trade liberalisation in West Africa, exploring how effective data management and regulation can facilitate economic integration and regional development. The paper highlighted key areas such as data privacy, cybersecurity and cross-border data flows, analysing their impact on trade efficiency, competitiveness and economic growth. The findings suggest that a balanced approach to data governance can significantly enhance trade liberalisation by fostering a trustworthy and resilient digital trade environment, ultimately contributing to sustainable economic development in West Africa. It further identified best practices and potential challenges and put forward policy recommendations for harmonising data governance standards to ensure they align with international norms while addressing local socio-economic contexts.

Keywords: cross-border data flows, cybersecurity, data governance, digital trade, trade liberalization

IV.III Intersecting Digital Governance and Sustainable Development Goals in Africa

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Abstract

The advent of Information and Communication Technologies (ICTs) and the internet has revolutionalised the manner in which governments and citizens interact as well as service delivery models. Digital tools have the potential to promote sustainable economic transformation and development within the 21st century by ensuring that governments attain cost efficiency and effectiveness gains. The successful attainment of Agenda 2030 has become a priority for all governments across the globe and Africa is no exception. There is acknowledgement that Agenda 2030 can be driven by digitisation efforts; however, there is little scholarly evidence that indicate how digital tools can be incorporated in SDGs implementation in Africa. The study adopted extant secondary qualitative literature as the research method. Findings, conclusions and recommendations are drawn from documentary search of books, journal articles, working papers and government reports. This study focused on examining how ICTs can be incorporated into the SDGs implementation trajectory, progress made and challenges being faced. The study findings established that despite progress made in adopting ICTs by several African countries, most of them have failed to fully embrace ICTs in driving the implementation of SDGs. African countries are facing underlying problems which include the digital divide, lack of political will, lack of skills and limited funding, among others, which have been a hindrance towards their digitisation efforts. The study recommends that governments in Africa have to invest in regulatory and policy frameworks, source adequate funding for digital projects and educate the general populace on ICTs.

Keywords: Sustainable Development Goals, Information and Communication Technologies, Fourth Industrial Revolution, Digitalisation, Public Service Delivery.

IV.IV Does institutional quality moderate the impact of trade and foreign direct investment (FDI) on climate change in sub-Saharan Africa (SSA): Greening the African economies?

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Abstract

Globalisation has made it possible for nations to relate to one another through trade and foreign direct investment. Trade is asserted to be the engine of economic growth. The world over engages on trade as no nation produces every commodity needed by its citizens; so, countries produce and sell to other nations but buy from other countries. The growth effect of foreign direct investment (FDI) on the host countries can be enormous, yet such investments bear some costs. These costs could be observed from effluents emitted to the environment through the activities of the foreign companies and industries in the host countries. Institutional framework guides the economic activities in most economies worldwide and hence institutional quality determines the extent to which environmental protection could be achieved. The objectives of this study are to determine the impact of trade and FDI on the level of environmental degradation and to estimate the interactive effect of institutional quality on impact of trade and FDI on environmental quality. The data for this study will be sourced from the WDI of the World Bank Group. Employing both the Fixed Effect model and the Two-Step System GMM method on annual data from 47 SSA countries in the period 2005-2022 shows that foreign direct investment has a mixed and significant influence on the level of environmental pollution whereas trade openness negatively influences climate change in SSA countries. It is recommended that governments in SSA should focus on enhancing the quality of institutions, specifically targeting improvements in rule of law, government effectiveness, and control of corruption; governments should encourage policies that attract high-quality FDI with sustainable practices.

Key words: Institutional quality, greenhouse gas, trade openness, pollution, investment.

V. CLIMATE VARIABILITY, TECHNOLOGY AND TRADE

V.I Understanding the Intricate Nexus: Climate Variability, African Integration, and Sustainability

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and

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Abstract

The slow pace of economic growth in Sub-Saharan Africa has been a source of concern, despite its resource wealth. This study empirically explores the interaction between climate variability, economic integration, and sustainable development. Employing a causal research design and rigorous econometric techniques, we analysed the interdependencies among these factors from 1960 to 2022. using a dataset of 46 African countries. The analysis includes OLS and ARDL models. The findings reveal a positive impact of economic integration components (trade, technology and migration) and climate variability on sustainability, in line with SDGs 9 and 10. The model shows strong explanatory power (R-squared = 0.9864) and confirms both short-term and long-term relationships among the variables. However, climate variability exerts a moderating influence on these relationships. The ECM analysis underscores climate variability's crucial role in sustainability (SDG 13). Policy frameworks should integrate climate and economic strategies, leveraging initiatives like AfCFTA and WTO to achieve sustainable development goals in the region.

Keywords: Africa, AfCFTA, climate variability, economic integration, retarded growth sustainable development, SDGs, WTO.

JEL Classification: O40, Q54, F63

V.II Does Trade Openness Spur CO2 Emissions in Low Carbon Footprint Region? Evidence from Selected Africa Economies

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&

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Abstract

Arguably, trade as the fulcrum of sustainable development, comes with some cost which include—climate change and environmental degradation. The relationship between trade openness and carbon emissions has been a debate in the literature. Little attention, however, has been given to emissions from regions with low carbon footprint in relation to trade. Does developing countries' import and export increase emissions? What is the role of trade openness interactions on environmental degradation? This study, covering the period between 1990 and 2023 provides new empirical evidence to underscore the effect of trade openness and energy use on the level of emissions in selected Africa countries using a panel quantile regression model. The results suggest that trade openness does not significantly influence carbon emissions, an inverse relation was observed; whereas, energy use and GDP per capita do. A unit increase in energy use and GDP per capita increases C02 emissions by 1.4 percent and 0.04 percent respectively on average through the 30th and 90th quantiles. This implies that Africa CO2 emissions are not majorly driven by foreign trade but by domestic activity. A gradual shift to a more environmental friendly energy sources such as renewable energy becomes inevitable. We therefore recommend huge and rapid investment in renewable energy for domestic productivity and reduction in emissions.

Key words: Trade Openness, Africa, Emission, Panel.
JEL Classification: Q56, F14, F64, N57, C22.

V.III Economic Globalisation and Agriculture Value-Added Nexus: Empirical Analysis in Lesotho

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&

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Abstract

This study examines the impact of Economic Globalisation (EG) on agriculture value-added (AVA) in Lesotho using annual data from 1975 to 2021. Applying the Autoregressive Distributed Lag (ARDL) model, the analysis reveals a significant relationship between economic globalisation and agricultural value added. Key findings reveal a complex relationship: EG brings short-term gains in AVA but also long-term challenges such as environmental degradation and market volatility, while exchange rate volatility poses challenges. The study recommends policies to enhance trade facilitation, attract foreign investments, and stabilise the exchange rate to bolster agricultural growth. These insights are vital for policymakers aiming to strengthen Lesotho's agricultural sector in the global economy.

Keywords: Agriculture Value Added (AVA), Autoregressive Distributed Lag (ARDL), Economic Globalisation, Lesotho

VI. DIGITAL TECHNOLOGY, REGIONAL INTEGRATION AND INTERNATIONAL TRADE OUTCOMES

VI.I Impact of digital technology on Nigeria's trade and gender performance: CGE Analysis

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&

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Abstract

This paper examined the impact of digital technology on Nigeria's trade and gender performance. This study employed the recursive dynamic Computable General Equilibrium (CGE) model based on Walrasion's theory of market behaviour in Nigeria. The underlying database used is Nigeria 2019 SAM. The baseline scenario was calibrated to incorporate the change (5% increase) induced by technology efficiency in the manufacturing industry in Nigeria to reduce import dependency. The simulated scenarios demonstrated a rise in technology for manufacturing effectiveness and its implications for the economy, trade, and gender performance. The key findings show that it will positively impact the economy. For instance, there is an increase in GDP, investment, government revenue associated with taxes, and exports in the short, medium, and long terms. The GDP increased on average by 0.47% between 2004 and2028. However, imports will increase in the short term but decline in both the medium and long term indicating positive export performance in achieving import substitution and weakening over-dependence on manufactured commodities. Furthermore, the policy was found to promote gender equality because the male gender was disproportionately affected, which could be linked to male dominance in Nigeria's manufacturing industry. However, there is a trace of gender inequality in pay and unemployment across all labour categories. Technology is a displaced labour market, especially for those in the informal and unskilled labour categories. Thus, technology adoption in Nigeria's industrial sector will support trade performance, investment, economic growth, and the reduction of gender disparity. It is recommended that the government intervene through transfers to poor households to mitigate the socioeconomic consequences of connected unemployment.

Key Words: Technology, Gender equality, Trade and performance, GCE analysis

VI.II Mobile Internet and Intra-regional trade flows in West Africa

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Abstract

Intra-regional trade within West Africa has attracted concerns over its flows and associated benefits. This paper examined the relationship between mobile internet and intra-regional trade flows for six West African countries due to their trade relations for the period 2000-2023. While the theoretical framework relied on internetisation management theories, the gravity model estimation was employed in analysing the trade flows. Results show that income of both exporting and importing countries facilitated trade; distance retarded trade relations with inflation included. Mobile internet variable measured by the proportion of individuals using internet facilitated exports flow in the region. It is important that West African governments further improve access to mobile internet with minimum costs. Road networks between countries should be put in good shape to facilitate easy mobility.

Keyword: Mobile Internet, Intraregional trade, Gravity model

JEL: F10, F18, M15

VI.III The Potential Effects of The African Continental Free Trade Area on Intra-African Trade: Gravity Model Approach

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Abstract

The study delves into the transformative potential impact of the African Continental Free Trade Area (AfCFTA) on intra-African trade dynamics. Using the gravity model approach, the study explores the intricate web of trade relationships within the African continent, shedding light on the potential and opportunities that the AfCFTA presents for fostering economic growth, enhancing trade efficiency, and promoting regional integration. Panel data from various sources, including the CEPII Data, International Monetary Fund, WITS, WGI, and World Development Indicators was utilised. The OLS results indicate a positive correlation between AfCFTA and intra-African trade, suggesting that the AfCFTA has the potential to increase intra-Africa trade by 52.3%. Again, the results reveal significant disparities in gross domestic product among AfCFTA member nations, underscoring the economic imbalance within the trade area. Intra-Africa trade has a 50% possibility to increase for every percent-age increase in gross domestic product. For every percentage increase in distance, intra-African trade decreases by 8.9% on average and ceteris paribus. The model is a good fit showing that the explanatory variables explain the dependent variable to the tune of 89.3%. In addition, the fixed effects results show that AfCFTA is positive and is statistically significant at 10% indicating a weak relationship with intra-African trade by 35.2%. Again, trade in-creases by USD 0.485 for every unit dollar increase in GDP. Moreover, the PPML results show that the model is a good fit, showing that the independent variables explain the dependent variable to the tune of 90.4%. Also, a per-centage increase in AfCFTA increases trade by 37.5%. The study also highlights the alignment of AfCFTA with the Sustainable Development Goals, particularly in terms of poverty eradication and economic opportunities. However, being landlocked is found to decrease trade between countries. Geographically closer nations typically engage in more trade, whereas farther away nations impede trade.

Keywords: African Continental Free Trade Area, Intra-Africa trade, Gravity Model

APPENDIX 1: Conference Program

National University of Lesotho (NUL)
World Trade Organization (WTO) Chair
3rd Annual Conference

Bridging Borders: Technology, Trade, and Africa's Renaissance
10th - 11th October 2024

ISAS Auditorium, Roma or Virtually (Zoom):
https://us06web.zoom.us/j/89844916513?pwd=cmcvaVpkaHpUVi8xMmVPdFFsWIFPQT09
(Meeting ID: 898 4491 6513; Passcode: 842514)

PROGRAMME

Programme Director – Day One: **Dr Denis N. Yuni**; Research Pillar Coordinator, *NUL-WTO Chair*

Note: Time is according to the South African Standard Time (SAST)

DAY 1: **THURSDAY, 10ᵗʰ OCTOBER 2024**

PLENARY SESSION

08:30 – 09:00	Registration (ISAS Auditorium) / Signing into the Zoom platform
09:00 – 09:10	Opening Remarks – **Dr. Letzadzo Kometsi Dean Faculty of Law, NUL**
09:10 – 09:50	Keynote Address – **Dr Uchenna Anyamele,: CEO, Hakakire Consulting Services/Senior Research Fellow Centre for the Studies of the Economies of Africa (CSEA)**
09:50 – 10:00	Discussant – **Dr Tsotang Tsietsi**

SESSION I: **ICT AND TRADE OUTCOMES**

Chair Dr. Letzadzo Kometsi Dean Faculty of Law, NUL

10:00 – 10:15	Bridging Borders: Information and Communication Technology and International rade Outcomes in Lesotho
	Presenter: Lefa Matsoai – National University of Lesotho
10:15 – 10:20	**Discussant: Yemisi Adelakun,** University of KwaZulu-Natal, South Africa
10:20 – 10:35	How has ICT investment and utilization translated to ICT Exports in Africa?
	Presenter: Christian Urom – Paris School of Business, Paris, France
10:35 – 10:40	**Discussant: Nthabiseng Letlala,** National University of Lesotho
10:40 – 11:00	**Q & A / General Discussions**
11:00 -11:40	**Group Photo and Tea Break**

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SESSION II:	**BLOCKCHAIN TECHNOLOGY, AI AND TRADE OUTCOMES**
Chair	Dr Tsotang Tsietsi - National University of Lesotho
11:40 – 11:55	Blockchain Technology for Strengthening Agricultural Value Chains and Trade in Eswatini
	Presenter: Thandokuhle Knowledge Silindza - University of Eswatini, Luyengo Campus
11:55 – 12:00	**Discussant: Caiphus Absalom Mamba -** University of Eswatini
12:00 – 12:15	Blockchain for Agricultural Supply Chains: Legal Prospects and Challenges in Africa
	Presenter: Chido_Teclar Mitchel_ Muza – Overseas Development Institute
12:15 – 12:20	**Discussant: Chinagorom E. Alita-** Alex Ekwueme Federal Univeristy Ndufu-Alike Ikwo
12:20 – 12:35	AI and inclusive economic growth: integrating marginalized African communities into global trade networks
	Presenter: Chinagorom E. Alita – Alex Ekwueme Federal Univeristy Ndufu-Alike Ikwo
12:35 – 12:40	**Discussant: Retšepile Patricia Monatsi,** Legal Officer Mayet & Associates
12:40 – 12:55	Quantitative Review of IoT Adoption and Supply Chain Efficiency in Five Nigerian Companies
	Presenter: Ezekwueme A. Elozana - University of Nigeria, Nsukka
12:55 – 13:00	**Discussant: Gafar Idowu Ayodeji -** Augustine University. Ilara-Epe
13:00 – 13:30	**Q & A / General Discussions**
13:30 – 14:30	**Lunch Break**
SESSION III:	**HUMAN CAPITAL, ICT DEVELOPMENT AND INTERNATIONAL TRADE OUTCOMES**
Chair	Dr Alouis Chilunjika – National University of Lesotho
14:30 – 14:45	Bridging the Digital Divide: How Education Can Empower Africa in the Global Marketplace
	Presenter: Caiphus Absalom Mamba - University of Eswatini
14:45 – 14:50	**Discussant: Thandokuhle Knowledge Silindza,** University of Eswatini, Luyengo Campus
14:50 – 15:05	Towards Manpower Development and Trade through Artificial Intelligence in Member Countries of African Continental Free Trade Area: Evidence from Nigeria.
	Presenter: Stephen C. Chioke – Legacy University Okija
15:05 – 15:10	**Discussant: Keith Tichaona Tashu, University of the Western Cape**
15:10 – 15:25	Impact of Cross Border Paperless Trade and Human Capital Development On Advanced Global Value Chain (GVC) Participation: Implication for Lesotho
	Presenter: Ojo J. Adelakun - National University of Lesotho

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15:25 – 15:30	Discussant: Jimoh Olakunle Saka, Lagos State University, Ojo, Nigeria
15:30 – 15:45	Digitalising Trade: Leveraging Digital Ecosystems for MSMEs in Africa
	Presenter: Retsepile Patricia Monatsi - Legal Officer Mayet&Associates
15:45 – 15:50	**Discussant: Boris Awa - University of Dschang & Institut d'Enséignement Supérieur, (INES) Ruhengeri**
15:50 – 16:15	**Q & A / General Discussions**
16:15 -16:25	**Tea Break**
16:25 – 16:30	Closing Remarks for Day 1 – **Dr Alouis Chilunjika - NUL**

DAY 2: FRIDAY, 11ᵗʰ OCTOBER 2024

Programme Director – Day Two: **Ntate Rorisang Lesaoana;** Research Pillar Co-coordinator, *NUL-WTO Chair*

SESSION IV:	**REGULATORY FRAMEWORKS, DIGITIAL GOVERNANCE AND INTERNATIONAL TRADE OUTCOMES**
Chair	Chido_Teclar Mitchel_ Muza – Overseas Development Institute
09:00 – 09:15	Navigating Legal Complexities: The Regulation of Crypto Assets as Securities in CEMAC.
	Presenter: Dr Boris AWA, Lecturer in Law at Institut D'enseignement Supérieur de Ruhengeri, Rwanda
09:15 – 09:20	**Discussant: Chido_Teclar Mitchel_ Muza** – Overseas Development Institute
09:20 – 09:35	Data Governance and Trade Liberalisation in West Africa.
	Presenter: Prof Gafar Idowu Ayodeji - Augustine University, Ilara-Epe
09:35 – 09:40	**Discussant: Ojo Johnson Adelakun** – National University of Lesotho
09:40 – 09:55	Intersecting Digital Governance and Sustainable Development Goals in Africa
	Presenter: Keith Tichaona Tashu – University of the Western Cape
09:55 – 10:00	**Discussant: Stephen Chinedu Chioke - Legacy University Okija**
10:00 – 10:15	Does institutional quality moderate the impact of trade and foreign direct investment (FDI) on climate change in sub-Saharan Africa (SSA): Greening the African economies
	Presenter: Ezebuilo R. Ukwueze - University of Nigeria, Nsukka
10:15 – 10:20	**Discussant: Ezekwueme Augustine Elozana - University of Nigeria, Nsukka**
10:20 – 10:50	**Q & A / General Discussions**
10:50 -11:10	**Tea & Coffee Break**
SESSION V:	**CLIMATE VARIABILITY, TECHNOLOGY AND TRADE**
Chair	Dr Johnson Adelakun – National University of Lesotho

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11:10 – 11:25	Understanding the Intricate Nexus: Climate Variability, African Integration, and Sustainability
	Presenter: Dare John Olateju – University of Jos
11:25 – 11:30	**Discussant: Teboho Molefi** – National University of Lesotho
11:30 – 11:45	Does Trade Openness Spur CO2 Emissions in Low Carbon Footprint Region? Evidence from Selected Africa Economies
	Presenter: Gbenga P. Sanusi- University of Ibadan, Ibadan/Anchor University, Lagos, Nigeria
11:45 – 11:50	**Discussant: Lefa Augustinus Matsoai** – National University of Lesotho
11:50 – 12:05	Economic Globalization and Agriculture Value-Added Nexus: Empirical Analysis in Lesotho
	Presenter: Teboho Molefi – National University of Lesotho
12:05 – 12:10	**Discussant: Gbenga Peter Sanusi** – National University of Lesotho
12:10 – 12:40	**Q & A / General Discussions**
12:40 – 13:40	**Lunch Break**
SESSION VI:	**DIGITAL TECHNOLOGY, REGIONAL INTEGRATION AND INTERNATIONAL TRADE OUTCOMES**
Chair	Mr Malefetsane Nketekete - National University of Lesotho
13:40 – 13:55	Impact of digital technology on Nigeria's trade and gender performance: CGE Analysis
	Presenter: Yemisi Adelakun – University of KwaZulu-Natal, South Africa
13:55 – 14:00	**Discussant: Ezebuilo R. Ukwueze** - University of Nigeria, Nsukka
14:00 – 14:15	Mobile Internet and Trade flows in West Africa
	Presenter: Jimoh Olakunle Saka - Lagos State University, Ojo, Nigeria
14:15 – 14:20	**Discussant: Dare John Olateju – University of Jos**
14:20 – 14:35	The Potential Effects of The African Continental Free Trade Area on Intra-African Trade: Gravity Model Approach
	Presenter: Nthabiseng Letlala - National University of Lesotho
14:35 – 14:40	**Discussant: Christian Urom** - Paris School of Business, Paris, France
14:40 – 15:00	**Q & A / General Discussions**
15:00 -15:20	**Tea Break**
15:20 – 15:30	**Closing Remarks & Vote of Thanks - Dr Denis N. Yuni**

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