

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

## **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 specializing 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. Utilizing a mixed-methods approach, this study leverages data from the 2023 National University of Lesotho (NUL) - World Trade Organization (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 imply 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:** Global Value Chain, Human Capital Development, Cross-Border Trade, Import, Export, Trade Facilitation

**JEL Classification:** O55, O15, F14, F13

## **1.0 Introduction:**

Global value chains (GVCs) are progressively defining the modern wave of international trade as the global economy continues to change (UNIDO, 2019). Its formation had a profound impact on the structure of the global production system, putting the specialisation of nations and individual businesses within GVCs at the core of economic research. According to a progress study on GVC,

participation increased significantly from 35.2 per cent in 1995 to 46.1 per cent in 2008 (Polovina & Peasnell, 2023). However, the 2008 financial crisis severely affected GVC activities, resulting in a contraction in participation rates that did not start to rise again until 2010. Since then, participation rates have stabilised, but the GVC's structure has fundamentally changed due to technical advancements and the cyclical nature of economic development in the context of global commerce (Kyzyma *et al.*, 2023; Polovina & Peasnell, 2023; Li, Li, & Liao, 2022).

The 1990s and 2000s saw a global surge of production fragmentation attributable to several variables, several of which are essential for facilitating trade (Johnson & Noguera, 2017). For example, the revolution in the information and communication technology (ICT) space resulted in new information management software, more powerful personal computers, and more affordable and dependable telecoms (World Bank, 2020). Digital technology breakthroughs made it possible for industrial processes to become increasingly globalised, allowing more businesses to outsource the manufacture of parts, components, and services to foreign suppliers—even those located in remote areas (Antras & De Gortari, 2020).

Regarding the relevance of global value chains (GVCs), a series of research has been conducted about GVCs' increasing significance in both developed and developing nations (Johnson & Noguera, 2017; Cieřlik *et al.*, 2019; Kyzyma *et al.*, 2023). With GVC, a reduction in the development cycle was made possible coupled with an increase in productivity gains (Haworth, 2013 Baldwin & Yan, 2014)). When GVC was not prominent, this contrasted with the traditional Late Development model that was the foundation of the "new competitive order." GVCs help small and medium-sized enterprises get into global markets, particularly by finding their niches

(UNCTAD2010). Therefore, a nation such as Lesotho benefits from integration into the GVC; however, increased participation is offset by advanced skill acquisition enabled by world-class human capacity development and technological innovation, which is reflected in the digitisation of trade processes (Shepherd & Duval 2017).

Generally, Sub-Saharan Africa's GVC participation accounted for around 8% of the overall GVC between 1990 and 2015 (World Bank, 2020). North and Sub-Saharan Africa have succeeded in joining GVCs in the food, automobile and textile industries and certain commercial services. But with just 3% of the world's trade in intermediate products, Africa is still a minor player in the global economy. African exports typically arrive in GVCs at the outset. A significant portion is used as inputs for exports by other nations, indicating the continued dominance of natural resources and agriculture in African exports.

According to Lee *et al.* (2021), participation in higher GVC requires policies mixture in favour of infrastructural development institutional support and other enabling variables. The cost and time involved in executing trade agreements have become crucial factors in a fiercely competitive global market, which is why the transition from paper to paperless trade procedures has happened so quickly. Through technological innovation and the digitisation of the cross-border process, major actors in the GVC have benefited from this (UNESCAP, 2019). Globally speaking, WTO TFA-related policies are generally implemented rather successfully. Across the world, a variety of Regional Trade Agreements (RTAs) and Economic Trade Agreements (ETAs) promoted the use of paperless facilitation in improving trade processes. The Australia-Japan Economic Partnership Agreement, which made its debut in 2015, established as a permanent norm the economies'

acceptance of e-certificates and other necessary papers. According to Dash *et al* (2020b), The COVID-19 pandemic was a major factor in accelerating the adoption of paperless commerce and digital transformation globally (WTO, 2020). While the percentage of Cross-Border Paperless Trade implementation is significantly lower at 38% than that of Paperless Trade implementation (64%), the overall progress in implementing both Cross-Border Paperless Trade and Paperless Trade measures is still seen as noteworthy (WTO, 2020).

Paperless trade makes international transactions quicker, more efficient, and more affordable by doing away with the need for physical documentation. According to research conducted by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP, 2019), implementing paperless commerce might result in an average reduction of 13–15% in trade transaction costs. The rapid track paperless and contactless trade facilitation that ensures sustainability and optimisation has been made possible by the deployment of current information and communication technologies to simplify and automate trade through electronic data interchange, single windows, and digital custom processes. In addition to improving trade competitiveness, automated customs implementation addresses supply chain management and related logistical concerns, hence fostering cross-border e-commerce. (Dash *et al.*, 2020). Businesses find it simpler because of the related time and cost savings, especially small and medium-sized businesses. The World Commerce Organisation (WTO) claims that paperless commerce may greatly increase supply chain coordination and visibility, resulting in GVCs that are more robust and efficient (WTO, 2020). Paperless commerce may provide businesses with a competitive edge by lowering operating costs and raising customer satisfaction through quicker,

more dependable service delivery, according to research by the International Chamber of Commerce (ICC) (ICC, 2017).

Beyond the adoption of more extensive paperless commerce, the World Bank (2020) asserted that upgrading requires greater skills, while entry into the industrial sector requires a big pool of low-skilled people. Human capital development through education and training, infrastructure development, and increased capital availability all contribute to economies' integration into the GVC, according to research by Bamber *et al.* (2014), Guinn (2014), and OECD (2013). As they work towards export-led industrialisation and GVC involvement, many developing nations are placing a high priority on training human capital.

The need for human capital development is emphasised, as is the fact that growth rates cannot be maintained without adopting ever more complex GVC participation models. However, the demands on skills, connections, and regulatory bodies increase as one moves from restricted production to more advanced manufacturing and services, and ultimately to creative activities (World Bank, 2020). Most developing nations must overcome the difficulty of establishing prerequisites for GVC integration, which goes beyond liberalised investment and trade policies.

Another crucial component of a manufacturing company's competitive human capital is worker capital. While many low-skilled professions have been displaced by new technologies, which have drastically transformed how businesses operate, highly trained personnel are necessary to fully use these technologies. Workers become knowledge workers due to their creativity, problem-solving

abilities, and technology capabilities, which provide the manufacturing company with unique competencies (Graham & Rosenthal, 1986; Levy & Murnane, 2004; Youndt *et al.*, 1996). Additionally crucial are the interpersonal abilities of employees, particularly in a collaborative setting (Gupta & Goyal, 1989; Norman *et al.*, 2002). For instance, the reduced work-in-process inventory in a just-in-time (JIT) system moves autonomous individual jobs to more cooperative tasks (Johnson & Manoochehri, 1990). However, as China has shown, a nation's labour costs may increase if it continues to participate in and upgrade GVCs. To export more sophisticated manufactured goods and services, workers must upgrade their abilities (Pathikonda & Farole, 2017).

Trade liberalisation and incentives for foreign direct investment (FDI) are two ways that increased involvement in the GVC might be realised, according to Shrestha, R., & Winkler, D. (2021). This also explains why developing country officials encourage involvement in the global value chain (GVC) to increase domestic productivity, for example by cutting tariffs and offering incentives for foreign direct investment (FDI). Through knowledge diffusion spillovers deriving from technology as well as all kinds of codified and "tacit knowledge" relevant to production, FDI businesses can increase the productivity of local firms (Hoekman and Javorcik, 2006). At least in the medium to long term, increases in workers' skills can be linked to the rise in domestic business productivity brought about by FDI.

Likewise, engagement in GVC can enhance workers' competencies via several channels of transmission (e.g. refer to Farole, Staritz, & Winkler (2014) and Taglioni & Winkler (2016)). Any nation that wants to participate in advanced GVC must have adequate human capital. The most

direct route is through employees learning skills unique to the GVC sector. When doing business in developing nations, GVC companies must make sure that their employees are qualified to meet the global quality standards set by global lead companies (World Economic Forum, 2015; Criscuolo & Timmis, 2017). Even if international lead companies sometimes procure from vendors or contract manufacturers in low-cost nations, most finished items are still intended for established consumer markets and are thus subject to strict quality control standards. In GVC sectors, advanced worker skills may also be required to operate machinery or employ imported supplies. Businesses taking part in GVCs can thus immediately train their employees or acquire additional competent staff to satisfy these demands. FDI inflows to emerging nations, which had been strong recently, did, however, fall by 7% in 2023. Net of conduits flows to developed economies decreased by 15%. They were impacted by a significant decline in the value of cross-border M&As as well as corporate financial reconfigurations, which were partially prompted by efforts to impose a worldwide minimum tax on large multinational businesses (MNEs). (UNCTAD, 2024)

Businesses in Lesotho have not fully taken advantage of the potential presented by GVC under accelerated trade and investment liberalisation as well as regional growth, even though GVC plays a significant role in encouraging inclusive economic growth. The process of establishing and maintaining an environment that allows Lesotho enterprises to grow their capacity and get access to foreign markets through GVCs is, however, little documented. Policymakers and other interested parties must investigate possible trade facilitation-related reasons to establish practical policy solutions. Trade facilitation is a barrier to the digitisation of internal and external cross-border trade procedures, which limits enterprises' involvement in GVCs. Although South African businessmen were aware of the possibility of digitising border processes within the domestic

economies in which multinational corporations operate, their awareness of the extent of the emerging disruptions—their speed, scale, and scope—often led to a reluctance to make new investments due to the obstacles they posed to the ease of export, which made it challenging to engage in GVC as effectively as possible.

Following the AGOA, Lesotho's garment exports to the United States increased gradually between 2000 and 2004. However, from 2004 to 2009, these exports sharply declined, and there has been an apparent standstill since. This experience is not unlike the nation's battle to establish paperless cross-border procedures, which has affected the nation's involvement in GVC in the garment industry. Cherkashin & associates (2015). The Fernandes *et al* (2019). 31 trade facilitation initiatives have an average implementation rate of 64.7% worldwide. Despite COVID-19's effects, there was a rise of more than 5 percentage points between 2019 and 2021. The Pacific Islands' economy lags at 40.1%, whereas developed economies lead at 81.8%. The rate in Sub-Saharan Africa is 49.1%. With a 10-percentage-point gain, South Asia had the most advancement. The Pacific Islands, Developed Economies, and Sub-Saharan Africa all saw significant advancements. United Nations (2024).

Growing manufacturing concentration in regional and/or global supply chains means that GVCs offer member nations excellent prospects. This article investigates the connection between human capital in Lesotho and GVC membership. Huang *et al* (2024). According to Escaith (2014), taking part in GVC enables nations to concentrate on activities in which they have a comparative advantage rather than developing a whole product or value chain.



Our primary contribution is a clear examination of the connection between cross-border paperless trade, human capital, and GVC involvement. Such research is necessary for a few reasons. Despite the abundance of research on productivity spillovers, there is a dearth of studies evaluating the underlying transmission pathways. This study adds to the body of knowledge on productivity by demonstrating the importance of workers' talents. Furthermore, it is difficult to find studies on the interception of cross-border paperless trade, which is a component of trade facilitation and GVC participation. This is because the idea was first introduced in 2017 with the World Trade Organisation Trade Facilitation Agreement, which came into effect after being approved by two-thirds of WTO members (World Trade Organisation, 2013). Thus, no research has been done in this field specifically in the context of Lesotho.

About Lesotho enterprises' engagement in GVC, our study will be the first to go into this field. Our study was significant because it examined the importance of trade facilitation components and human capital development in the case of Lesotho, going beyond the fundamentals that have been identified as critical determinants for GVC participation (World Bank, 2020). This is further demonstrated by the fact that one's ability to achieve a positive trade agreement—which aims to lower transaction costs and improve trade flow between parties—may be compromised by onerous cross-border processes. Nonetheless, the African Growth and Opportunity Act (AGOA), which permits qualified sub-Saharan African nations to export a variety of goods to the United States duty-free, has given the Lesotho textile industry a considerable boost (AGOA.info, n.d.). Due to Lesotho's and other African nations, particularly the SSA, poor implementation levels of digitalising cross-border procedures, this level, when compared to analogous sectors in Bangladesh and Vietnam, can still be regarded as substandard.

Six sections make up the paper's structure, including the introduction. The second section examines pertinent theories and literature. The data and technique are described in Section Three. Section Four talks about the structural equation model's result. The study's limitations, policy recommendations, and results are presented in Section 5.

## **2.0 Literature Review:**

### **2.1 Overview of Global Value Chain and Labour Skill Human Capital Development**

From 1990 to 2008, there was a growing globalisation of the production of goods and services. As businesses started to arrange their output in intricate global value chains (GVCs), the trend became more noticeable in some areas and industries than in others (Baldwin, 2016). They created the items in one nation, obtained the necessary parts and components from other nations, and put the finished goods together in still another. Consequently, there was a significant surge in foreign trade and investment flows, much surpassing the expansion in economic production. Over the past three decades, the rise of international commerce has been largely attributed to the fragmented manufacturing process, which has led to many emerging nations entering the global value chain (GVC). The start of the global financial crisis in 2008 and the subsequent severe recession slowed down the process, leading some to speculate that the phenomenon had reached its peak. A crucial benefit and connection that has emerged is the opportunity to engage in highly skilled industrial production. (World Bank, 2020; Gereffi, 2014)

This is typically not the case for nations with a lot of natural resources and less trained workforce, such as Lesotho and many Sub-Saharan African nations. These nations are more likely to specialise in low-skilled manufacturing output and exports, as the Heckscher-Ohlin model of international trade anticipated, in line with their factor endowments. In developing nations, GVC participation and human capital have a favourable association, despite the preceding reasoning being based on final products trade. Even the least skilled activity within a GVC often requires more skills than non-GVC-related jobs in developing nations, even though the skills composition of the workforce has a significant impact in deciding what forms of GVC activity take place in a country or area (Grundke *et al.*, 2017). Consequently, GVC-oriented enterprises are generally more productive than non-GVC firms, notwithstanding considerable variation (World Bank, 2020). Therefore, increased GVC activity tends to raise the need for skilled labour, for example, to support the use of cutting-edge inputs or to meet stricter production and quality requirements. We anticipate that appropriately skilled people will be concentrated in those sectors or places when GVC activity is distributed predominantly in one area within a nation. This relative rise in skilled workers may be the result of skilled workers migrating from other areas or industries, or it may be the result of local skill growth.

## **2.2 Role of human capital in GVC participation**

Participation in Global Value Chains (GVCs) is influenced by more than just the cost and quality of labour; the overall state of human capital plays a significant role. According to OECD (2013), higher value-added GVC activities are concentrated in nations with well-developed human capital. Knowledge-based and human capital-driven activities are the primary drivers of performance in GVCs (Del Prete *et al.*, 2018). Nations that provide advanced, difficult-to-replicate goods and services tend to capture greater value from GVCs. The transition from low-value-added to high-

value-added activities requires additional knowledge-based capital (OECD, 2013; González et al., 2015), and upgrading capabilities is key to seizing new opportunities (Hausmann & Hidalgo, 2011; Caldarelli et al., 2012).

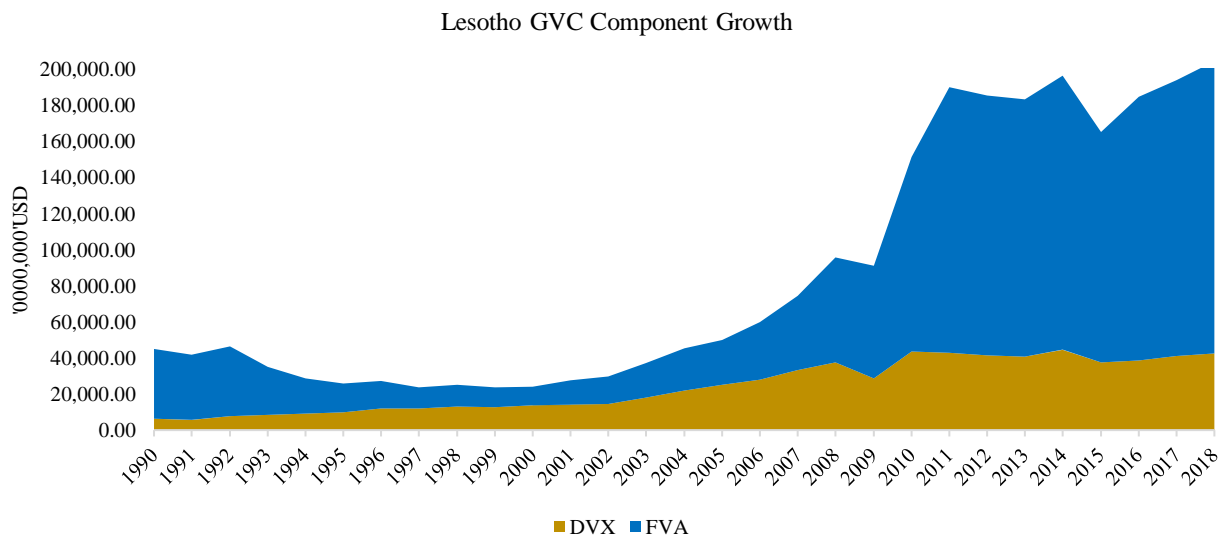
Multinational corporations seek competencies essential for innovation and competitiveness, and the evolving nature of employment driven by technological innovation affects these abilities. Hence, individuals with complex cognitive, socio-behavioural, and flexible skills are increasingly in demand. However, developing these skill sets requires a strong foundation in human capital, particularly in a globalized, automated world where qualities that technology cannot fully replicate are highly valued (WDR 2019).

Unfortunately, many developing nations have low-skilled or unskilled labor forces, often concentrated in low-productivity agriculture with limited access to technology. As a result, these countries are typically excluded from high-value-added GVC activities and struggle to diversify or upgrade. Empirical studies have shown that trade in value-added is positively influenced by education and training (Barro, 2001; Pathikonda & Farole, 2017). For example, Cheng et al. (2015) found that education quality is crucial for high-tech manufacturing integration, while basic education supports low-tech manufacturing. Human capital, institutional strength, market accessibility, and efficient logistics are the key factors driving GVC participation (Pathikonda & Farole, 2017).

Additionally, the gender-based classification of human capital has become a focal point. Higher backward GVC participation correlates with increased female labour market participation, particularly in manufacturing firms involved in GVCs (World Bank, 2020).

**Hypothesis 1:** Human Capital Development has a direct positive relationship with advanced GVC participation for Lesotho.

## 2.3 Stylise fact on Lesotho's Participation in GVC



### UNCTAD-Eora Global Value Chain Database

Lesotho's increased Foreign Value Added (FVA) relative to Domestic Value-Added in Export (DVX) can be ascribed to its involvement in specialised industrial activities, its integration into international production networks that rely significantly on imported inputs, and the existence of EPZs. The World Bank (2024) highlights that because foreign inputs play a significant role in the processing and assembly of imported commodities, the value contributed by foreign inputs in developing nations might significantly surpass local value added. UNCTAD (2024) examines how the majority of inputs for EPZs and other agreements are imported while very little local value added is produced, leading to greater FVA.

The information covering the years 1990 through 2018 provides a thorough understanding of Lesotho's performance in the Global Value Chain (GVC). Throughout this time, Lesotho's export-driven economic value added, or DVX (Domestic Value Added in Exports), showed a consistently rising trend. DVX began trading at \$6,222.68 million in 1990 and increased steadily, reaching a

peak of \$44,470.48 million in 2014. This suggests that the local value contributed to Lesotho's exports has increased significantly. But in the years that followed, there was a little drop, and by 2018, DVX had dropped to \$42,642.36 million. This pattern points to a period of performance fluctuations in the latter half of the examined period.

The value of foreign inputs utilised in Lesotho's exports, or FVA (Foreign Value Added in Exports), on the other hand, showed a great deal of fluctuation. FVA first fell to \$11,234.68 million by 1999, from \$38,649.64 million in 1990, because of a decreased reliance on foreign inputs. FVA increased significantly starting in the early 2000s and reached \$161,755.60 million by 2018. This sharp increase suggests that Lesotho's export output is becoming more and more dependent on imported components.

Lesotho's expanding integration into global value chains, with a greater role for foreign inputs in its exports, is shown by the difference between DVX and FVA developments. Lesotho also manages to boost local value addition. This intricate interaction highlights how Lesotho's economic involvement in international trade networks has changed during the years under study. The textile and garment sectors make up most of Lesotho's economy, which is heavily dependent on foreign investment and imported goods. Because of the nature of the manufacturing activities, the local value-added stays lower, despite the high FVA reflecting the cost of these imports.

## **2.4 Global Value Chain Participation and Paperless Cross border Trade Implementation**

A nation's ability to participate in Global Value Chains (GVCs) is closely linked to its trade facilitation efforts, particularly in the implementation of modern information and communication

technologies (ICTs) for cross-border product transfer (UNESCAP, 2021). The Trade Facilitation Agreement (TFA), introduced in 2004 and ratified by two-thirds of WTO members in 2017, plays a crucial role in determining a country's preparedness for effective GVC participation (Neufeld, 2014). Key elements like cross-border paperless trade aim to reduce costs and enhance trade efficiency.

Several regions have adopted automated customs systems, electronic single windows, and digital trade facilitation projects to streamline trade operations. The integration of paperless trading provisions in many recent bilateral and regional trade agreements, often through dedicated chapters on e-commerce and customs, reflects the growing importance of digital commerce. However, implementation varies across regions, with wealthy nations leading in adoption rates. By 2021, about 64% of countries had implemented cross-border paperless commerce, up from 34% in 2017 (ESCAP, 2017).

Developed countries dominate GVCs due to their strong legal frameworks and advanced technology infrastructure, which facilitate efficient trade processes. These nations benefit significantly from GVCs, supported by systems like single windows and electronic data interchange. Conversely, developing countries lag behind in digital trade adoption, limiting their GVC participation and economic gains (Monteiro & Teh, 2017; UNESCAP, 2024).

In addition to preserving trade competitiveness, these paperless trade procedures are quickly becoming necessary to handle the trade control and logistical issues brought on by a surge in small shipments and cross-border e-commerce. The shift from national paperless systems, which only

allow Business to Government (BtoG) data exchange between stakeholders within a nation, to cross-border paperless trade systems, which allow for the seamless exchange and legal recognition of electronic data and documents between stakeholders located in different nations, is crucial to addressing these challenges (Duval *et al.*, 2019).

Compared to the traditional method of sending commercial information using paper papers, the stand shocked. On the same token, trade transactions that are both "paperless," in which all trade-related data and documents are transferred electronically, and "paperless," in which just a portion of the data and documents are sent electronically, are included in the category of paperless commerce. Given the concept and parameters of paperless trade, information systems used to conduct business, whether business-to-business (B2B), business-to-government (B2G), or government-to-government (G2G), are classified as paperless trade systems.

The primary goal of paperless trade systems, as information (processing) systems, is to expedite the exchange of trade data throughout global supply chains. But as information and communication technology (ICT) has advanced, paperless trade has found new uses and is now able to streamline the movement of goods through the use of mobile technology, GPS, and radio frequency identification (RFID); this kind of application makes it easier to improve security and traceability in global supply chains.

On this back of the foregoing, we state our second hypothesis as follows:

**Hypothesis 2:** Cross-border paperless trade has a direct positive relationship with advanced GVC participation for Lesotho.

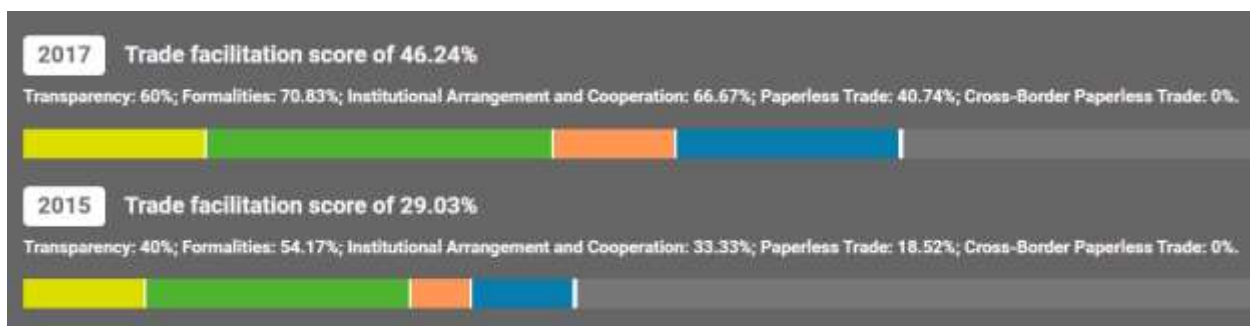
Because paperless commerce makes it easier for relevant parties to transmit financial information efficiently, its applicability to financial flows also grows. Since an import transaction in one



economy correlates with an export transaction in another economy through an international supply chain, transactions involving international commerce must involve transactions across many economies. However, since an economy only has authority over one portion of its territory and another portion is regulated by a partner economy, its focus is trade transactions that take place within its borders, whether they are imports or exports. As a result, trade facilitation policies are mostly carried out inside economies. While paperless commerce is cross-border, much like traditional international trade, the development and application of paperless trade systems—particularly B2G and G2G systems—occurs mostly at the domestic level as a means of trade facilitation.

Regarding Lesotho, as of 2017. 46.24% is the trade facilitation score. 60 per cent transparency, 70.83 per cent formalities, 66.67 per cent institutional arrangement and cooperation, 40.74 per cent paperless trade, and nil cross-border paperless trade. Trade facilitation received a 29.03% score in 2015. 40% of communication is transparent; 54.17% of formalities; 33.33% of institutional arrangement and cooperation; 18.52% of paperless trade; and 0% of cross-border paperless trade.

2015 and 2017: Lesotho Trade Facilitation Score as of 2017.



Source: *The UN Global Survey on Digital and Sustainable Trade Facilitation, 2023. Available at [unfssurvey.org](https://unfssurvey.org)*

E-Payment of Customs Duties and Fees was gradually adopted. The electronic filing of customs declarations and air cargo manifests, and the establishment and dissemination of average release timings. The internet publication of current import-export laws, since 2015, pre-arrival processing post-clearance audits have been conducted as part of the paperless trade facilitation program. (2024 United Nations). Community for the Development of Southern Africa (SADC). Implementing the electronic Certificate of Origin (eCoO) is a major step forward for the Trade Facilitation Programme (TFP), which is funded by the European Union and the German Corporation for International Cooperation (GIZ) as part of the "Cooperation for the Enhancement of SADC Regional Economic Integration" (CESARE) program. With online applications and real-time tracking, the eCoO replaces the manual SADC Certificate of Origin, increasing efficiency. It successfully lowers fraud at border posts because of cutting-edge security features like optical watermarking and online authenticity checking. The Development Community of Southern Africa. (2022)

## **2.5 Empirical Review**

Zhou, Z., Lai, Q., and He, J. (2024) used a fixed-effects model to empirically analyse country-level panel data from 59 economies from 2007 to 2018. Their analysis looks at the connection between GVC positions and digital technologies, and it finds a U-shaped link. Countries that employ digital technology in its early phases see a reduction in their GVC status as a result of adverse effects on input demand chains. But when digital technologies advance, they improve GVC positions by having a favourable impact on output supply chains. The study also emphasises how productivity affects GVC status by mediating the effect of digital technologies. Furthermore,

the variability in how digital technology affects GVC positions is investigated, demonstrating that lower-income nations with strong trade openness arrive at a U-shaped turning point more quickly, enabling their advancement in GVC

The impacts of GVC involvement on small and medium-sized enterprises (SMEs) in Vietnam, Indonesia, Thailand, Sri Lanka, and Sri Lanka were studied by Sanjeewa, C. (2021). Descriptive analysis was used in the study to determine how many more business possibilities GVCs provide for SMEs, helping to promote inclusive economic growth, create jobs, and lessen poverty. SMEs' success in GVCs is influenced by a variety of elements, including capital assets, workforce size, sales income, human capital, and training. According to the report, to increase GVC involvement, governments and policymakers should foster conditions that support SME expansion and global competitiveness.

The impact of trade facilitation (TF) measures on international trade flows and GVC involvement in developing Asia and the Pacific was examined by Martínez-Zarzoso (2023). The UN Global Surveys on Digital and Sustainable Trade Facilitation data were used in the study, which revealed the importance of TF measures regarding institutions, formalities, and transparency. By cutting down on import and export times and costs, these actions enhance logistics efficiency. To encourage GVC involvement, the report advises low-income Asian nations to concentrate on institutional quality and transparency rules.

Shrestha & Winkler (2021) looked at the connection between Indonesian workers' abilities and GVC involvement. The study discovered a relationship between increased GVC activity at the district-sector-year level and a higher chance of vocational education among workers by combining data from the National Labour Force Survey and the Large/Medium Industry Survey. The study also showed that, at the district level, there is a positive correlation between GVC

activity and human capital, with larger salary premiums for vocational education in districts with higher GVC intensity.

Yameogo & Jammeh (2019) evaluated the factors that influence Sub-Saharan Africa's involvement in the production of GVCs. They discovered that initial human capital endowment and skilled labour are important factors influencing GVC participation using a fixed-effect gravity model. Exports of foreign value-added products gain more by including them than do nations with lower baseline capital endowments. Furthermore, nations with net migrant inflows participate more actively in GVCs.

Grundke *et al.* (2017) used TiVa and the OECD Survey of Adult Skills to investigate, sector-specifically, the link between trade and value-added skills. According to their research, the following competencies are essential for international integration across industries: cognitive capabilities, ICT skills, managerial and communication skills, and readiness to learn. Research and development spending has a strong correlation with value-added trade, suggesting that research and development expenditures are necessary for GVC participation.

In 11 European nations, Corrado, *et al* (2017) investigated the effect of knowledge-based capital on GVC involvement. The study discovered a favourable correlation between GVC membership and intangible assets, such as design, brand equity, R&D, and organisational efficiency. The impacts differed by industry, with ICT having a greater impact on service value chains and R&D having a greater impact on manufacturing value chains.

The importance of human capital development in GVC operations in East Asia was examined by Hing, V. (2022). Based on panel data from eleven countries using a gravity model framework, the study discovered that education and skills increase the involvement of local enterprises in GVC.

While skills are more crucial for backward GVC activities, higher education levels enable forward GVC involvement. The significance of logistics, transport quality, and trade policy in influencing value-added trade was also emphasised by the study.

Karim, Md. Rezaul (2015) examined Bangladesh's trade facilitation performance and the country's developments in the garment sector. According to the report, the industry has major obstacles from high trade prices and lead times, especially when importing inputs and exporting final items. Bangladesh's competitiveness in the international garment industry might be increased by significantly lowering trading costs and times through improved trade facilitation performance.

## **2.6 Theoretical Review**

### **Fragmentation Theory**

According to the idea, industrial processes may be divided into several phases, each of which can be situated in a different nation according to cost and comparative advantages. The theoretical foundation for comprehending the fragmentation of production was developed by Jones and Kierzkowski (1990), who emphasised the role of services in enabling the breakdown of production processes. They contend that by allowing companies to take advantage of particular geographical advantages, the unbundling of manufacturing phases improves overall efficiency and competitiveness in the global market. Fragmentation is justified when: (1) production costs are reduced in fragmented production blocks, allowing the company to take advantage of labour and production cost differences between the original and new positions; (2) incurred service link costs are reduced in connecting remote production blocks; and (3) network setup costs are reduced (Arndt & Kierzkowski, 2001). One essential feature of GVCs is their fragmentation, which allows businesses to get inputs from the most affordable places around the world to maximise production. Fahrig (2003).

The contribution of trade facilitation to increased GVC participation is further highlighted by fragmentation theory. Efficient logistics, strong regulatory frameworks, and streamlined customs processes are essential for smooth cross-border trade in products and services. Effectively implementing trade facilitation policies puts nations in a better position to draw in investment and join GVCs. Trade facilitation lowers transaction costs and increases the competitiveness of nations inside GVCs, as stated by the World Trade Organisation (WTO) (Business Today) (ESCAP). Marvin % Graham (2001).

New ideas were then developed, including trade-in tasks (Grossman & Rossi-Hansberg, 2008) and unbundling (Massunmi, 2006). As a result, there is now a more recent school of thought in the literature on the global fragmentation of production that places more emphasis on task specialisation than on product specialisation. Commerce in value-added measurements developed because of the awareness of the novel aspects of international commerce (Koopman *et al.*, 2014). These metrics provide information on whether and how much a certain nation takes part in GVCs.

In this regard, Ando & Kimura (2005b) investigate the mechanics of production/distribution networks in East and Southeast Asia using the idea of two-dimensional fragmentation. In the section that follows, we address this once again about SME involvement in local production and distribution networks.

Trade policy and economic growth are greatly impacted by the fragmentation of GVCs. Gereffi and Fernandez-Stark (2011), for example, point out that developing nations may become

integrated into global value chains by focusing on certain value chain sectors, including manufacturing or assembly of intermediate commodities. Industrialisation, employment, and economic growth can all be accelerated by this integration. But there are drawbacks as well, such as reliance on foreign companies and susceptibility to changes in the world economy (Graham, S., & Marvin, S. (2001))

#### 4.0 Data and Methodology

Gender differences in access to opportunities, networks, and resources can influence GVC engagement. Female entrepreneurs may face unique challenges, such as a lack of finance and mentorship, which may affect their participation in GVC. Gender equality must be encouraged to lessen these disparities and increase participation rates. The nature of this study was quantitative. The study adopted a multi-stage sampling technique for the FSIs. A sample of 153 firms was surveyed across five districts of Butha-Buthe, Leribe, Maseru, Mafeteng, and Mokhotlong in Lesotho. The questionnaire used for data collection was developed from the extensive literature review based on the overall trading experience of respondents in Lesotho. The questionnaire consisted of both structured and open-ended questions (questions one and five), with the questionnaire being divided into two sections

The GVC integration theory as developed by Gereffi et al., 2005 & Baldwin, 2016 forms the bedrock of our study. In this model, a country's participation in GVC depends on the level of reduced paperwork and human capital development.

Probit model which is a specific type of GLM takes the form:

$$P(y_i = 1|X_i) = \Phi(X_i'\beta) = \int_{-\infty}^{X_i'\beta} \Phi(S)ds = \int_{-\infty}^{X_i'\beta} \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}S^2} ds \dots \dots \dots eq 1$$





Import_Constraint_Customerprocedure	0.325296	0.119666	2.718	0.00656 **
Pseudo R-squared (McFadden):	-0.0316822	83.7223024		
Deviance Residuals	83.722302			
AIC	95.722			

*Source: Authors' computation 2024*

*Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1*

### Parameter Estimate

Only the variable "Import\_Constraint\_Customerprocedure" is significant, suggesting that difficulties in import-related customer procedures significantly affect the dependent variable.

The company head's (highesteducfh) coefficient of highest education is -0.071751, with a p-value of 0.48473 and a z-value of -0.699. This shows that the result in this model is not substantially predicted by the greatest level of education (p-value > 0.05). We found that the coefficient value for Intl\_trade\_Experience (International Trade Experience) was 0.134571, with a p-value of 0.40957 and a z-value of 0.825. Similar to schooling, there is no discernible relationship between this variable and the dependent variable. The human resources metric Full\_Time\_Employees has a coefficient of 0.000873, a z-value of 0.055, and a p-value of 0.95579. This suggests that the number of full-time employees has no discernible effect on the dependent variable. Cost custom, or the Cost of Customs Procedures, has a p-value of 0.25513, a z-value of 1.138, and a coefficient of 0.038198. There is likewise no statistical significance for this variable. The procedure of Import\_Constraint\_Customer: With a z-value of 2.718 and a p-value of 0.00656, the coefficient is 0.325296. This is statistically significant (p-value < 0.01), suggesting that the dependent variable is significantly positively impacted by import limits associated with customer operations.

### Model Fit Statistics:

**Null deviance:** 159.424 on 115 degrees of freedom (this reflects the deviance of the model with no predictors). **Residual deviance:** 83.722 on 109 degrees of freedom (this reflects the deviance of the model with predictors included). **AIC:** 95.722 (AIC is a measure of model quality, where lower values generally indicate a better fit).

The reduction in deviance from the null deviance to the residual deviance suggests that the model does explain some variation in the data. However, only one variable is significantly contributing to this explanation.

Trade theories and empirical literature may be used to analyse the conclusion that "Import\_Constraint\_Customerprocedure" significantly positively affects the dependent variable (likely involvement in Global Value Chains or a similar outcome based on the prior context). This variable implies that companies' capacity to participate in trade and develop sophisticated global value chains (GVCs) may be impacted by obstacles or limitations in import-related customer procedures.

## **5.1 Discussion of Result**

Our study has investigated the impact of cross-border paperless trade and human capital development on advanced global value chain (GVC) participation in Lesotho. Our findings revealed that only import constraints were statistically significant in impacting GVC participation for Lesotho.

Given this, the benefit of import restrictions imply that these obstacles hinder businesses' capacity to take advantage of scale economies, which lowers their competitiveness in international marketplaces (Krugman, 1979; Helpman & Krugman, 1985). The importance of economies of scale and network effects is emphasised by the new trade theory, particularly in sectors of the economy where monopolistic competition exists. Businesses that participate in GVCs have access to reduced trade costs and the capacity to effectively handle intricate supply chains. Constraints in customer procedures, on the other hand, may increase transaction costs, diminishing the advantages of economies of scale and resulting in less-than-ideal participation in GVCs.

Non-tariff barriers (NTBs), which have grown in importance as traditional tariffs have declined as a result of trade liberalisation, can be seen as import restrictions (Hoekman & Nicita, 2011). NTBs, such as processes about imports, are frequently mentioned as major barriers to trade, especially in developing nations. According to the literature, trade flows and economic integration can be greatly increased by lowering NTBs (Moïsé & Sorescu, 2013). The conclusion that import restrictions matter much lends credence to the claim made by Djankov et al (2010) that bureaucratic and regulatory barriers are important factors in determining trade participation and GVC integration.

In contrast, according to the World Bank (2020), empirical research using this data demonstrates that simplifying import procedures can improve a firm's competitiveness and boost its involvement in international commerce. The present research highlights the significance of import limits and their alignment with actual findings. This underscores the necessity of trade facilitation for enterprises participating in global value chains. According to the OECD's work on trade facilitation, customs processes may be made simpler to dramatically lower trade costs, especially for small and medium-sized firms (SMEs). It is important to adopt trade facilitation reforms since the beneficial impact of import limits in our study shows that enterprises with greater procedural burdens are less able to compete in GVCs (Moïsé & Sorescu, 2013).

Conventional models of trade, such as the Heckscher-Ohlin model and the Ricardian comparative advantage, place a strong emphasis on the role that technology and factor endowments play in shaping trade patterns. These models concentrate on cross-border commerce, supposing little trade friction and restrictions. But they don't specifically take into consideration the effects of non-tariff trade barriers, such as import-related customer processes, which are becoming more and more important in contemporary commerce. According to Melitz's heterogeneous firm theory, the fixed

costs of international commerce prevent all but the most productive companies from entering export markets. These fixed expenses are increased by import restrictions, which may discourage even profitable businesses from trading. This argument is supported by the considerable influence of import limits on the dependent variable, which shows that bureaucratic obstacles might prevent businesses from participating in GVCs by increasing the productivity threshold required to compete globally (Melitz, 2003).

The fragmentation of production across borders, when businesses specialise in certain functions rather than whole goods, is highlighted in GVC literature (Gereffi *et al.*, 2005). Customer processes and other import restrictions cause delays in this process by raising lead times and uncertainty, both of which are crucial for just-in-time manufacturing systems. It may be difficult for businesses to take part in GVCs if timely imports of intermediate items are hindered or made more expensive by procedural restrictions (Gereffi, 2014).

## **5.2 Recommendations and conclusion**

Trade facilitation measures should be given priority by policymakers, as evidenced by the fact that import-related customer procedures have a major impact on enterprises' trade involvement. Mitigating the intricacy, duration, and expenses linked to import protocols might augment enterprises' capacity to engage in GVCs and reap the rewards of global commerce. This is especially important in developing nations like Lesotho, as procedural obstacles are frequently more severe and disproportionately impact smaller businesses (Shepherd & Wilson, 2009).

Harmonising customs processes and lowering trade barriers are common objectives of clauses included in regional trade agreements (RTAs). The noteworthy influence of import limitations implies that enhanced GVC involvement may be greatly aided by more thorough integration via

RTAs, which tackle these procedural problems. The African Continental Free Trade Area (AfCFTA) presents an opportunity to enhance GVC integration by streamlining customs procedures across African nations, hence lowering trade barriers. (UNECA, 2020).

The dependent variable's considerable positive correlation with "Import\_Constraint\_Customerprocedure" underscores the pivotal function of non-tariff barriers, namely those about import-related processes, in shaping businesses' involvement in global value chains. This result is in line with contemporary theories of trade, such as the New and New Trade Theories, which highlight the significance of business heterogeneity and trade costs in global commerce. The significance of trade facilitation policies in lowering these obstacles and boosting businesses' competitiveness in international marketplaces is further supported by the empirical evidence. Simplifying import procedures through policy may greatly increase GVC involvement and boost economic growth, especially in emerging regions.

To sum up, Paperless commerce, as discussed in previous chapters, has the potential to significantly improve trade efficiency and facilitate the integration of global supply chains, particularly in the context of cross-border transactions. However, achieving cross-border paperless trade provides more difficult challenges to solve than creating a local paperless commerce system.

The persistent economic uncertainty is causing people's suffering on a global scale. According to a new UNCTAD projection, the global economy is at "a critical juncture," with some economies flourishing and growing while others struggle and slow down. Therefore, overcoming trade barriers at unpredictable times can be facilitated by implementing cross-border trade facilitation measures. Better trade facilitation policies made it possible for nations to more expertly navigate the challenges posed by the COVID-19 epidemic than those without them

### 5.3 Limitation

It is critical to acknowledge the limitations of this research. First, because of the small sample size, the findings might not be as widely generalizable. One possible explanation for the lack of significance is a limited sample size. High p-values (e.g., 0.48473, 0.40957, and 0.95579, respectively) for several factors, like `highesteducfh`, `Intl_trade_Experience`, and `Full_Time_Employees`, suggest that these variables are not statistically significant in predicting the result. This implies that these variables could not have a significant effect on the model and that adding them could add noise instead of explaining anything. Furthermore, the data lacks particular metrics that would best capture the perspective of human capital development and GVC involvement from the standpoint of enterprises' operations. To improve, further study should include the right measures in data collecting across a bigger sample size to improve significance and generalisation. Moreover, data collection should be really purpose driven, transcending the mere need to build repository

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