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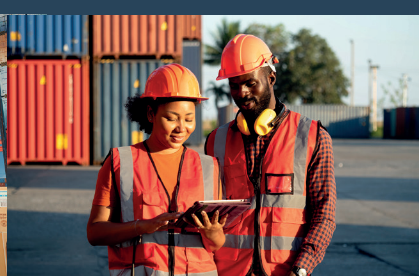
IMPACTS OF TRADE FACILITATION AND LOGISTICS PERFORMANCE ON TRADE FLOWS

THE CASE OF LANDLOCKED AFRICAN OIC COUNTRIES

(BURKINA FASO, CHAD, MALI, NIGER AND UGANDA)

Prepared by SESRIC and ITFC - 2022

ABOUT ITFC

The International Islamic Trade Finance Corporation (ITFC) is a member of the Islamic Development Bank (IsDB) Group. It was established with the primary objective of advancing trade among the member countries of the Organisation of Islamic Cooperation (OIC), which would ultimately contribute to the overarching goal of improving the socioeconomic conditions of the people across the world. Commencing operations in January 2008, ITFC has provided more than US$66.1 billion of financing to OIC member countries, making it the leading provider of trade solutions for these member countries' needs. With a mission to become a catalyst for trade development for OIC member countries and beyond, the Corporation helps entities in member countries gain better access to trade finance and provides them with the necessary trade-related capacity-building tools, which would enable them to successfully compete in the global market.

ABOUT SESRIC

The Statistical, Economic and Social Research and Training Centre for Islamic Countries (SESRIC), a subsidiary organ of the Organisation of Islamic Cooperation (OIC), has been operating from Ankara, Türkiye, since June 1978 as the main economic research arm, statistics centre and training organ of the OIC. The Centre has been engaged with statistical data collection, collation and dissemination on and for the OIC member countries, undertaking the preparation of research papers, reports and studies on economic cooperation and development issues contained on the agenda of various OIC ministerial and other forums, organizing training programs on subjects of immediate interest to the member countries, and putting out periodic and other publications in its areas of mandate for the benefit of the member countries.

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DISCLAIMER

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FOREWORD

Africa, like all other parts of the world, is slowly emerging out of a three-year global Pandemic, and yet, many countries on the continent are expected to face intense economic challenges in the current environment of exceptional economic and political uncertainties.

Good news, however, spring from the hope offered by the African Continental Free Trade Area (AfCFTA), which has granted Africa the possibility to unify its large market and trade, duty free since January 2021. The success is such that 41 out of 54 signatories have already ratified the agreement, demonstrating a consensus to the idea that the future of trade in Africa is intimately related to the success of the AfCFTA.

In this context of opportunity, we present the second series of the ITFC-SESRIC research trilogy on the impacts of the AfCFTA on selected OIC countries. Understanding just how the AfCFTA will impact African OIC countries, and thus how its contributions can be improved through policy and projects has been the focus of this collaborative project.

The first series, which we published in July 2021, observed the result of tariff reduction on 24 economic sectors in 6 countries. It identifies winning and losing sectors and serves to prepare responses to future obstacles, such as potential skills deficits that may limit social gains of the agreement when sectorial transitions occur.

With the second series, we are looking at the specific case of landlocked African OIC countries. Without exception, they are all identified as Least Developed Countries with significant economic disadvantages that limit their ability to achieve sustainable development. We argue that although tariffs are crucial, other measures, including trade facilitation policies, will yield even more benefits and at a lower cost if they are implemented adequately. The policy recommendations set out in this report offer highly tangible benefits in terms of broad increase in intra-African trade.

Governments and firms all need to embrace the possibilities offered by the continental agreement. There is a need for increasing awareness on its existence, its potential impacts and the reform requirements to make it an effective tool for development.

Cost-effective policies and interventions will be needed to allow funding skills and innovation to shift to new goals in order to build a stronger and more conducive trade environment. Countries already moving toward this type of dynamism will need to accentuate their efforts. For others, change is especially decisive now, when choices that have to be made are severely stretched by the three year pandemic and looming challenges ahead.

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EXECUTIVE SUMMARY

The African Continental Free Trade Area (AfCFTA) aims to significantly accelerate growth of intra-African trade and use trade more effectively as an engine of growth and sustainable development, by doubling intra-African trade and strengthening Africa's common voice and policy space in global trade negotiations. Trade facilitation is one of the crucial components of the AfCFTA Agreement, which is a particularly important policy dimension for the landlocked African countries as they face serious obstacles in accessing global markets by means of maritime transportation. In Africa, there are 16 landlocked countries, all of which are in the Sub-Saharan region and 13 of which are listed among the Least Developed Countries (LDCs). Five out of those 13 landlocked LDCs, namely Burkina Faso, Chad, Mali, Niger and Uganda, are OIC members.

This study investigates the impacts of alternative trade facilitation measures on trade flows with special focus on the five landlocked African OIC countries. By employing a diverse set of data and methodology, it is found that there are significant gains from trade facilitation and improved logistics infrastructure. This benefit is significantly higher in the case of African countries. While infrastructure investments in logistics generate the largest gains, landlocked countries can attain additional gains from efficiency improvements in trade facilitation measures. Nevertheless, aggregate impact of logistics performance remain significantly higher than the impacts of soft trade facilitation measures in both landlocked and coastal countries. This study also presents the potential gains for the five landlocked African OIC countries in case of a simulated improvement in their trade facilitation performance.

An improvement in aggregate Trade Facilitation Indicator (TFI) to the level of African average would enhance exports by 53% in Burkina Faso, 180% in Chad, 50% in Mali and 140% in Niger, considering their landlocked status. The gain would be huge in the case of Chad and Niger due to very low initial values. Burkina Faso would benefit most from the improvements in advance rulings and formalities related to documents. Chad would benefit most from the improvements in information availability, appeal procedures and formalities related to automation. Gains for Mali would come mostly from formalities related to automation and advance ruling. In Niger, these policy areas would be appeal procedures, external and internal border agency cooperation, and formalities related to automation and procedures. Since Uganda already performs above the African average in many indicators, it would attain significant benefits by improving governance and impartiality related to customs structures and functions.

Another simulation is conducted by artificially improving the Logistics Performance Index (LPI) scores of landlocked OIC countries. Improvement of overall LPI scores to the global averages would result in close to 20% increase in exports from Burkina Faso, Mali and Uganda. Growth in exports in Niger would reach almost 70%. Regarding the components of the LPI, Burkina Faso would attain the largest growth in exports via an improvement in tracking and tracing performance (17%), Chad in international shipments (41%), Mali in customs (25%), Niger in international shipments (14%) and Uganda in infrastructure (28%). Better logistics performance would also lead to higher volume of imports to these countries.

Overall, AfCFTA undoubtedly offers a window of opportunity for African development and integration, and trade facilitation will be an important catalyser of this process. In order to reap the benefits, there is a need for increasing awareness among all businesses and exporters on the existence of the free trade agreement and its potential impacts, informing policy makers on the potential benefits of the agreement and the associated reform requirements for better utilization, and enhancing multilateral collaboration with global development partners to provide the required financial and technical assistance to improve human, physical, technological and institutional capacities.

1. INTRODUCTION

This study is a contribution to the ITFC-IsDB AfCFTA Initiative, an initiative that combines policy work and technical assistance to support technical capacity agenda of AfCFTA institutions and member countries engaged in the AfCFTA implementation.[1] With this research, OIC institutions and their partners will be able to anticipate potential impacts, prepare to respond or adapt to new requirements, and develop new products to contribute to the strengthening of intra-OIC trade.

The African Continental Free Trade Area (AfCFTA), which entered into force in January 2021, promises to foster the economic integration, create regional value chains and accelerate the diversification of the economies across the continent. Scores of studies have been completed on the potential benefits of the agreement, and a diverse set of guidelines and policy options are offered to policy makers for its effective utilization. Studies highlight the fact that tariff elimination will bring some gains, but real benefit would come if tariff elimination is accompanied by additional trade facilitating reforms. In fact, the Agreement on the Establishment of the Continental Free Trade Area in Africa set the objective of "cooperating on customs matters and the implementation of trade facilitation measures" as one of its specific objectives. Seven out of the nine Annexes[2] of the Protocol are related to broader definition of trade facilitation, signifying the importance paid to trade facilitation issues.

Trade facilitation has emerged as an important issue for the world trading system over the last decade. In 2017, the Trade Facilitation Agreement (TFA) by the member states of the World Trade Organization (WTO) entered into force. The Agreement contains commitments to expedite the movement, release and clearance of goods, including goods in transit. It also includes provisions to help developing countries obtain technical assistance and capacity building for the implementation of the TFA (WTO, 2021). In line with WTO TFA, the AfCFTA Agreement under the Protocol on Trade in Goods calls for parties to take "appropriate measures including arrangements regarding trade facilitation in accordance with the provisions of Annex 4 on Trade Facilitation". It thereby recognizes the significance of eliminating non-tariff barriers (NTBs) and the implementation of trade facilitation in realizing and fulfilling the general objectives of the AfCFTA.

Key Messages

- Notwithstanding the expected potential gains from lower tariffs, a relatively stronger impact on trade flows would be achieved if measures are taken to facilitate trade and improve logistics infrastructure. What is more, this impact would be considerably higher in the case of African countries.

- While infrastructure investments in logistics generate larger gains, soft trade facilitation measures can generate quick wins with lower investment and resources. Moreover, landlocked countries can attain extra gains from efficiency improvements in trade facilitation measures.

- An improvement in aggregate Trade Facilitation Indicator to the level of African average would enhance exports by 53% in Burkina Faso, 180% in Chad, 50% in Mali and 140% in Niger. Similarly, an improvement in Logistics Performance Index to the level of global average would result in close to 20% increase in exports from Burkina Faso, Mali and Uganda. Growth in exports in Niger would reach almost 70%.

- Burkina Faso would benefit most from the improvements in advance rulings and formalities related to documents. Chad would benefit most from the improvements in information availability, appeal procedures and formalities related to automation. Gains for Mali would come mostly from formalities related to automation and advance ruling. In Niger, these policy areas would be appeal procedures, external and internal border agency cooperation, and formalities related to automation and procedures. Since Uganda already performs above the African average in many indicators, it would attain significant benefits by improving governance and impartiality related to customs structures and functions.

[1] The AfCFTA initiative was set up by the ITFC and the IsDB. It is articulated around four pillars: (1) Support to the AfCFTA Secretariat, (2) Implementation of the AfCFTA Operational Instruments, (3) Development of National Strategies and (4) Connectivity and infrastructure across Africa.
[2] These include Annex 3 on Customs Cooperation and Mutual Administrative Assistance, Annex 4 on Trade Facilitation, Annex 5 on Non-Tariff Barriers, Annex 6 on Technical Barriers to Trade, Annex 7 Sanitary and Phytosanitary Measures, Annex 8 on Transit and Annex 9 on Trade Remedies.

The challenges of African countries regarding the disproportionately high trade costs are well documented in the literature. The importance of trade facilitation is also well recognized and adequately highlighted (see Annex III on related literature). Yet, as discussed in the next section, African countries are significantly behind the world averages in terms of trade facilitation and logistics performance. Documentary requirements are time-consuming and customs procedures are cumbersome by international standards. Even though trade facilitation and the elimination of NTBs have been already on the agenda of the regional economic communities (RECs) in Africa, only little progress has been made, reflecting the lasting importance of advancing in trade facilitation measures.

in this context , this study takes a renewed look at the impacts of trade facilitation on trade flows with a special focus on African countries and presents the potential impacts of trade facilitation measures in five landlocked OIC countries by simulating an improvement in their index scores to the African or world average. While findings are in line with the existing literature, they also suggest significant additional benefits for landlocked countries from improvement of 'soft' measures of trade facilitation. The next section provides a summary of existing trade patterns of the five landlocked African countries, namely Burkina Faso, Chad, Mali, Niger and Uganda. It is followed by a review of related literature, and the estimation methodology and data. Section 5 presents the main results obtained by using a diverse set of trade facilitation indicators and estimation methodologies. Section 6 concludes the study.

2. CURRENT TRADE PATTERNS

Africa has a large population, but contributes far below its potential to the world economy. In the past two decades, the region's population increased from about 800 million to over 1.3 billion, accounting for an increasing share of the world population, from 13% in 2000 to 17% in 2020.[3] However, during the same period, the region accounted for only 2-3% of the world GDP[4] and the global exports[5]. Trade among African countries is also low, ranging between 15 and 18% (African Union, 2021).

Landlocked countries lack direct access to maritime trade, which constitutes a substantial part of international trade. The additional costs incurred to transport from/to distant seaports not only makes them pay more for freight than their coastal neighbours do, but also makes their exports more expensive. Therefore, transportation for landlocked countries is more costly and unattractive, negatively affecting their competitiveness and leading to lower trade numbers. Indeed, Figure 1 shows that between 2000 and 2020 in Africa, the share of merchandise exports in GDP was larger for coastal countries than for landlocked countries, which is understandable given the importance of access to the sea for foreign trade.

Summary of ITFC Portfolio in Africa 2008 – 2021

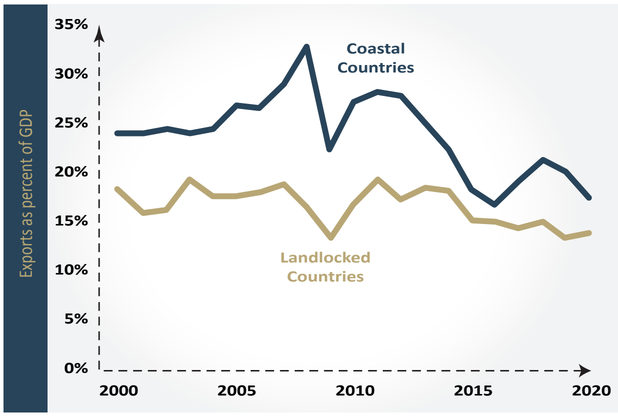
Since its inception in 2008, ITFC has contributed to the trade financing of at least half of the countries in Africa. The contribution by way of approval of trade financing facilities from 2008 – 2021 reached a cumulative amount of US$27.5 billion across 32 countries. This amount represents about 44.7% of the total ITFC approvals of US$61.4 billion for the subject period.

The ITFC financing in Africa has cut across different sectors, with the emphasis being on energy and agriculture. These two sectors are followed by the financial services and the health sectors respectively.

The five countries (Burkina Faso, Chad, Mali, Niger and Uganda) studied in this report cumulatively received financing approvals of US$2.8 billion during this period.

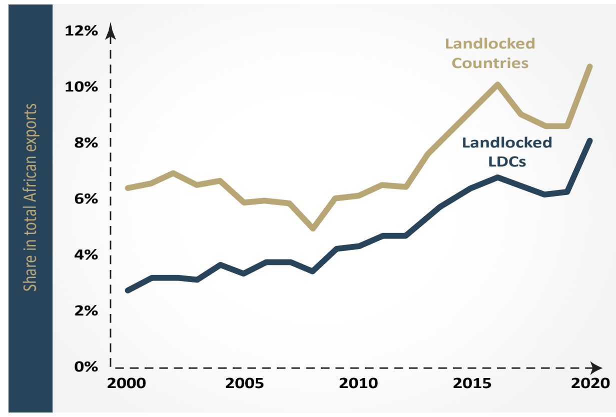
[3] United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects 2019, Online Edition. Rev. 1.
[4] IMF. World Economic Outlook (WEO) Database, October 2021.
[5] IMF. Direction of Trade Statistics (DOTS) Database.

Figure 1: Share of Exports in GDP in Africa: Landlocked vs. Coastal Countries



Source: Authors' calculation based on data from the IMF's Direction of Trade Statistics (DOTS) Database and World Economic Outlook (WEO) Database.

Figure 2: Increasing Share of Landlocked Countries in African Exports



Source: Authors' calculation based on data from the UNCTAD's Data Center.

Nevertheless, the 16 landlocked countries in Africa, which are home to a quarter of the region's total population, are gaining market share in total exports of the region. Their share in total exports of African countries showed an increasing trend after bottoming out at 4.9% in 2008 and reached 10.7% in 2020. Within that category, the landlocked Least Developed Countries (LDCs) followed a similar but smoother upward trend, with a share rising from 2.6% in 2000 to 8.1% in 2020 (Figure 2).

International Trade of the Landlocked OIC Countries in Africa

Exports, imports, trade balance and market share

The African landlocked OIC countries — hereafter referred to as ALOCs — have improved their trade performance over the past two decades. Their total annual exports increased from US$ 1.6 billion in 2000 to US$ 16.1 billion in 2020, corresponding to an average annual growth rate of 12.1%. Their imports followed a similar course and rose from US$ 3.7 billion to US$ 22.3 billion over the same period, with an average annual growth rate of 9.4%. The larger amounts of imports than exports have chronically led to trade deficits, which have moved to higher levels since the 2008/2009 global financial crisis. Averaged annually at US$ 1.9 billion during the 2000-2007 period, the deficits fluctuated in a range of US$ 4-7 billion in the next period until 2020 (Figure 3.A).

The average growth rates of exports and imports achieved by the ALOCs over the past two decades exceeded the continental averages — 4.9% for exports and 7.1% for imports. Accordingly, the share of these countries in total trade of all African countries increased over the 2000-2020 period, from 1.1% to 4.2% in exports and from 2.8% to 4.4% in imports (Figure 3.B).

At the country level, Niger had relatively lower trade values than the other ALOCs did, with its exports averaging annually at US$ 1.1 billion and imports at US$ 2.1 billion during the last five-year period of 2016 2020. Exports were around US$ 3 billion for all the other four countries, while imports varied from US$ 2.4 billion in Chad to US$ 6.6 billion in Uganda. Accordingly, Chad was the only ALOC with a trade surplus during the period under consideration, while deficits averaged annually at as high as US$ 3.4 billion in Uganda (Figure 3.C)

Direction of the trade and market concentration

The distribution of exports by destination region varies from one ALOC to another, though Asia comes to the fore on average basis. During the period from 2016 to 2020, on average, half (49.8%) of Mali's exports went to Asia, which was also the main export region of Chad (40.0%) and Niger (37.4%). Asia also had a significant export share in Uganda (37.8%) and Burkina Faso (26.3%), making it the second most exported region. Europe, on the other hand, was by far the largest export region for Burkina Faso, accounting for about two-thirds (63.8%) of exports, while it made up 17-28% of total exports in the other ALOCs. Intra-African exports were most prominent in Uganda, whose exports were predominantly to other African countries (42.2%). Intra-African exports were 33.2% in Niger and 20.6% in Mali – above the continental average of 17% –

and as low as 1% in Chad. Chad differs from the other ALOCs in exports to Northern America, given that these exports accounted for one-third (33.4%) of total exports in the former but less than 3% in the latter (Figure 4.A).

An analysis of the distribution of exports by partner country, on the other hand, reveals that exports of the ALOCs are concentrated in a limited number of countries. During the period from 2016 to 2020, the major five partners accounted for about 80% of total exports in Chad, Burkina Faso, and Mali and about 60% in Uganda and Niger. In particular, directed over half of the exports to a single partner, Burkina Faso was the ALOC that had the most concentrated (or least diversified) export markets, with a Herfindahl-Hirschman Index (HHI) value of 0.55. At the other side of the spectrum, Nigerian exports were the most diversified by destination market, with an HHI value of 0.24. The main destination markets were Switzerland for Burkina Faso, the United States for Chad, the United Arab Emirates for Mali and Uganda, and France for Niger (Figure 4.B).

As for the origins of imports of the ALOCs, African markets seem to have a more noticeable share in imports than exports. Data for the period from 2016 to 2020 show that Africa was the main supplier of imports of Mali and Burkina Faso, accounting, respectively, for 43.2% and 34.8% of their total imports. Intra-African imports was also above the continental average of 14% in the other ALOCs. On the other hand, Uganda and Chad were heavily concentrated in a single region that accounted for over half of their imports – 57.8% of imports of Uganda came from Asia and 56.5% of imports of Chad from Europe. Nigerian imports also originated mainly from Asia (40.9%) (Figure 4.C).

With the exception of Niger, ALOCs' imports have a lower market concentration compared to their exports. HHI values ranged from as low as 0.18 in Burkina Faso – more diversified markets of origin – to 0.26 in Niger – more concentrated markets of origin. This is also evident from the share of major five partners in total imports, which ranged from 46.5% in Burkina Faso to 64.6% in Chad. In the last five-year period under consideration, China was the largest import partner of Niger and Uganda, accounting, respectively, for 21.9% and 13.2% of their total imports. Chad imported mainly from France (25.3%), while Mali and Burkina Faso relied more on neighbouring Senegal (14.8%) and Cote d'Ivoire (14.0%), respectively (Figure 4.D).

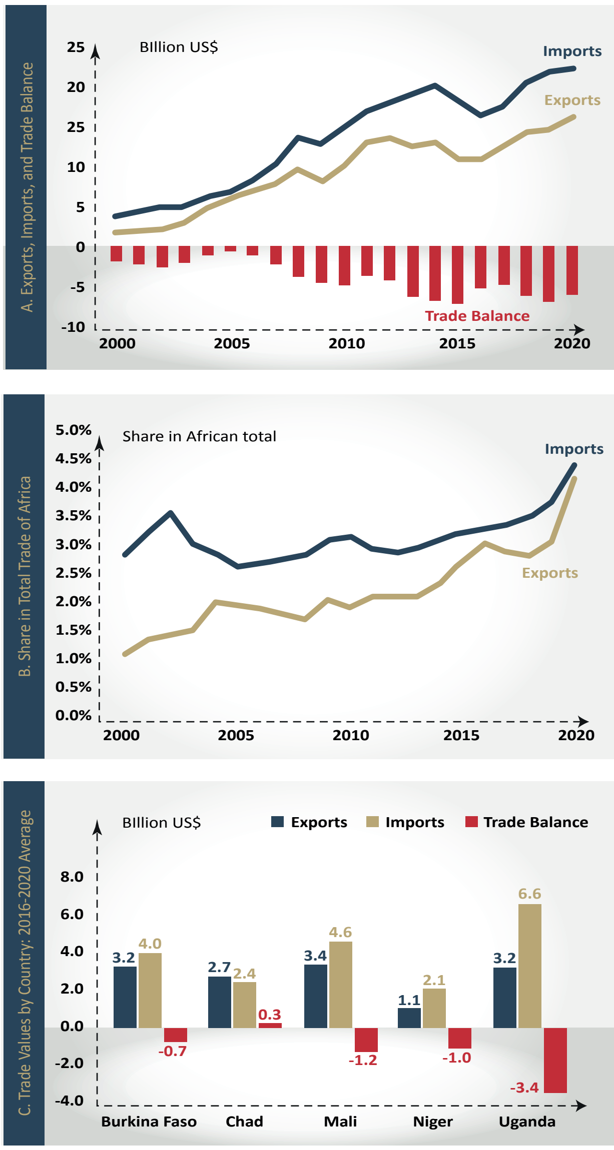
Composition of the trade and product concentration

The ALOCs usually rely on a limited group of commodities as their primary source of foreign exchange income. In the 2016-2020 period, crude oil (SITC 333) accounted for an average of 87.6% of Chad's exports, while gold (SITC 971) made up 70.0% of Burkina Faso's and 72.9% of Mali's exports. Cotton (SITC 263) was the second most exported commodity in all of these countries, accounting for 7-10% of total exports. This export structure indicates a high level of product concentration, reflected by high HHI values of 0.87 in Chad, 0.72 in Mali, and 0.69 in Burkina Faso. Uganda and Niger had relatively more diversified export profiles, with a HHI value of 0.29 and 0.30, respectively. Gold had a significant share in exports of these countries as well (Figure 5.A).

The composition of exports differs substantially when it comes to exports to Africa, except for Mali, whose exports consist mainly of gold, both to the world (72.9%) and to Africa (59.1%). Burkina Faso mainly exported zinc (SITC 686) to Africa, while Chad exported cotton (SITC 263), Niger petroleum products (SITC 334), and Uganda coffee (SITC 071). Compared to exports to the world, exports to Africa are less concentrated in all ALOCs except Niger. Uganda had the most diversified intra-African export profile, with an HHI value of 0.13, while Mali and Niger had the highest product concentration levels, with values close to 0.6 (Figure 5.B).

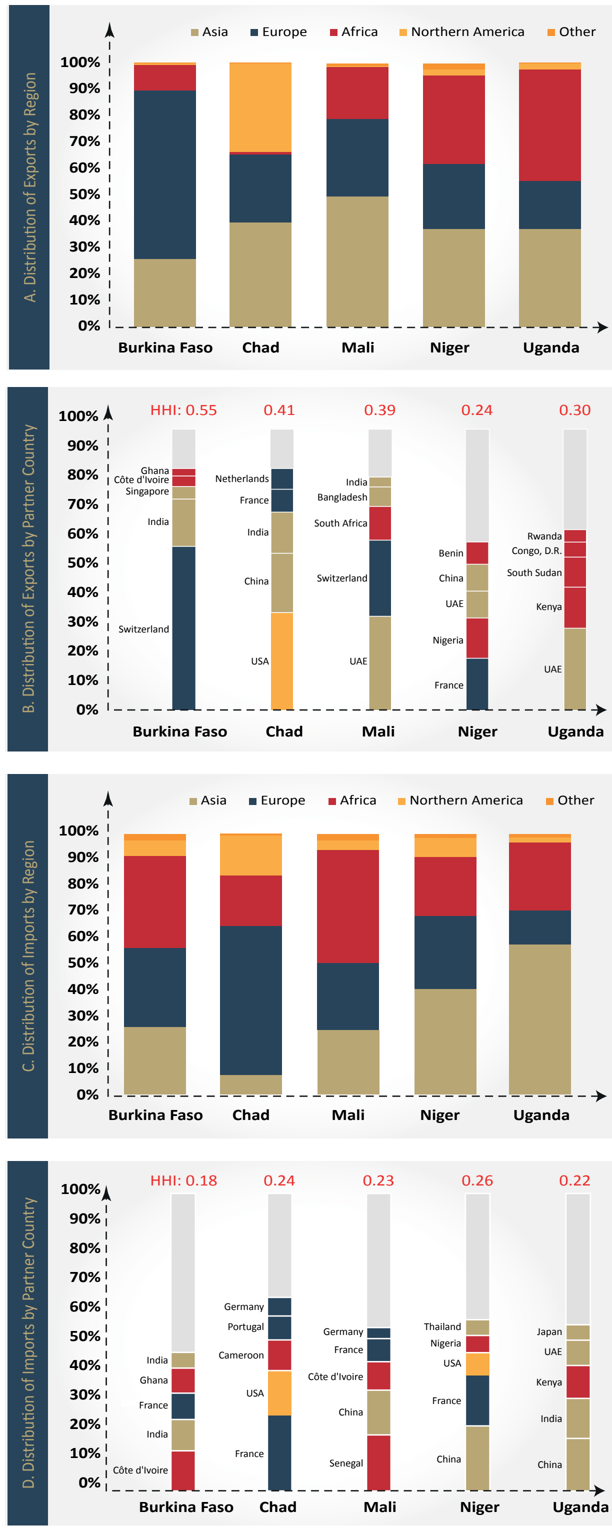
Figure 5 shows that, as opposed to exports, imports are more diversified in all of the ALOCs, and imports from Africa have higher product concentration levels than imports from the world. Confirming this situation is that the average HHI in the 2016-2020 period ranged from 0.11 in Chad to 0.16 in Mali in the case of total imports (compared to a minimum level of 0.29 in total exports) and from 0.19 in Niger to 0.39 in Mali in the case of intra-African imports. Petroleum products (SITC 334) had a significant role in this picture, as this commodity group had the highest share in total imports of Mali (17.7%), Burkina Faso (16.1%), and Uganda (12.3%) (Figure 5.C) and the highest share in intra-African imports of Mali (40.0%), Chad (27.6%), and Burkina Faso (21.5%) (Figure 5.D). Lime, cement, and fabricated construction materials (SITC 661) topped Niger's list of imports from Africa, while Uganda imported mostly gold (SITC 971) from the continent.

Figure 3: Trade Performance of the Landlocked OIC Countries in Africa



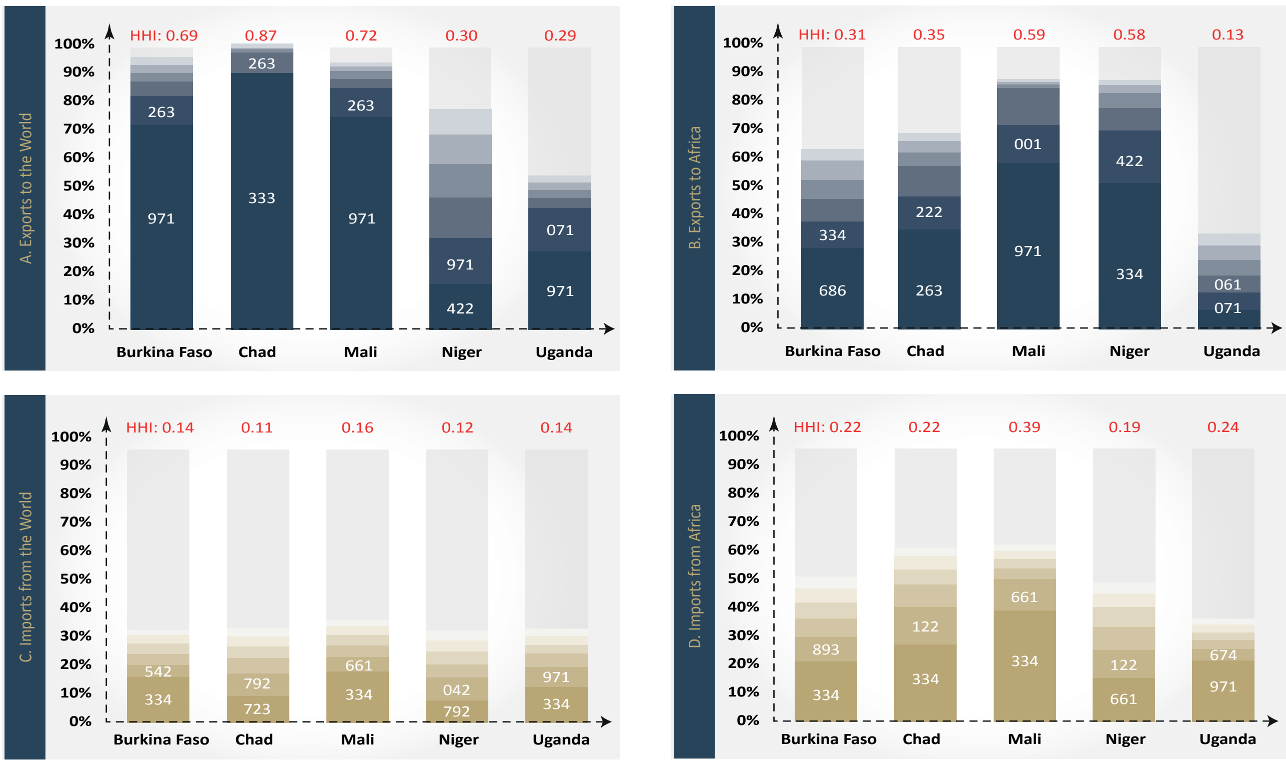
Source: Authors' calculation based on data from the UNCTAD's Data Center.

Figure 4: Direction of the Trade of the Landlocked OIC Countries in Africa (2016-2020 average, % of total)



Source: Authors' calculation based on data from the UNCTAD's Data Center.
HHI: The normalised Herfindahl-Hirschman Index, as a measure of concentration or an inverse measure of diversification, with values ranging from 0 to 1. Here, lower values of HHI indicate diversified markets (of destination or origin) whereas higher values reveal a high degree of concentration of markets.

Figure 5: Major Products Exported/Imported by the Landlocked OIC Countries in Africa (by SITC 3-digit commodity group*, 2016-2020 average, % of total)



Source: Authors' calculation based on data from the UNCTAD's Data Center.
HHI: The normalised Herfindahl-Hirschman Index, as a measure of concentration or an inverse measure of diversification, with values ranging from 0 to 1. Here, lower values of HHI indicate diversified products (of export or import) whereas higher values reveal a high degree of product concentration.
* Product classification is based on the 3-digit (group) level of the Standard International Trade Classification (SITC Rev.3). See Annex Table A3 for a description of the group codes shown on the figures.

Trade in Manufactured Goods

Manufactured goods have a minimal weight in exports of the ALOCs since these countries are heavily engaged in the export of primary commodities and gold. In imports, however, manufactured goods have a substantial share, leading to huge deficits in the manufacturing trade of these countries. During the 2016-2020 period, manufactured goods accounted for only 1.6% of total exports in Chad and as high as 17% in Niger and Uganda, while their share in total imports ranged from 62.4% in Mali to 75.3% in Chad (Figure 6). Most of the manufacturing exports in Uganda (82.2%), Burkina Faso (69.3%), and Mali (56.8%) were destined to African countries, while the manufactured goods exported by Niger and Chad mostly went to countries outside Africa. Manufacturing imports, on the other hand, were mostly sourced from outside Africa in all ALOCs, with those from Africa accounting for 10-25% of total imports (Figure 7).

Trade Facilitation and Logistics Performance

Over the past few decades, international trade volume has considerably increased, and major advances in information, communication and transportation technologies have allowed production processes to be increasingly fragmented across national borders, with global supply and value chains becoming a central characteristic of world trade and investment. In parallel, countries have made significant progress in removing barriers to trade by lowering trade tariffs and eliminating quota systems through numerous trade agreements at bilateral or multilateral levels all around the world. Nevertheless, there are obstacles seen as posing greater barriers to trade than tariffs and quotas do, such as lack of transparency about rules and regulations, redundant and lengthy clearance processes, and cumbersome formalities with multiple documents requirements, which all increase the costs and time of doing trade.

Trade facilitation, comprising the simplification, modernization and harmonization of export and import processes, has therefore emerged as a key factor for international trade efficiency and the economic development of countries. Over the last decade, it has gained prominence in the international political agenda, leading to the conclusion of the WTO Trade Facilitation Agreement (TFA) that entered into force on 22 February 2017 following its ratification by two-thirds of the WTO membership. All of the ALOCs are among the 154 WTO members that have ratified the Agreement so far. The TFA contains provisions for accelerating the movement, release and clearance of goods, sets out measures for effective cooperation between customs and other appropriate authorities on trade facilitation and customs compliance issues, and contains provisions for technical assistance and capacity building in this area.

Estimating that the TFA could reduce worldwide trade costs by 10-18%, the OECD developed a set of Trade Facilitation Indicators (TFIs) that mirror the substantive provisions of the TFA. The TFIs are composed of a set of variables measuring not only the actual extent to which countries have introduced and implemented trade facilitation measures in absolute terms, but also their performance relative to others (OECD, n.d.). A comparison of the TFIs between 2017 and 2019 reveals that all the ALOCs have improved their trade facilitation performance, nevertheless they still perform below the global average. Moreover, with the exception of Uganda, they also perform below the African average, which is below the global average as well (Figure 8).

In addition to trade facilitation, logistics services are also of crucial importance to international trade of countries. Inefficient logistics raises the cost of doing business and trade, and it reduces the potential for integration in the global value chains. The Logistics Performance Index (LPI), a benchmarking tool developed by the World Bank, measures performance along the logistics supply chain within a country and provides a dataset on the key areas. Consisting of six components (customs, infrastructure, ease of arranging shipments, quality of logistics services, timeliness, and tracking and tracing), the LPI allows for comparisons across countries. Last published for the year 2018, the LPI shows that all the ALOCs performed lower than the global average, though Burkina Faso, Mali, and Uganda slightly outperformed the average for Africa. While Chad's LPI score was rather comparable to the African average, Niger was among the bottom performers, with a rank of 157th (Figure 9).

In general, coastal countries have an advantageous position in terms of logistics performance when compared to landlocked countries, but this advantage is much less pronounced in Africa (Figure 9). This is actually a problematic issue for the landlocked countries in the continent, given the dependence of their logistics on the logistics of the transit coastal countries. The 2018 LPI report (World Bank, 2018) states that, "for most landlocked countries, the LPI might reflect access problems outside the country assessed, such as transit difficulties. The rating of a landlocked country might not adequately assess its trade facilitation reform efforts, because their success depends on international transit routes through its neighbours" (p.10). Therefore, since trade facilitation efforts depend on the workings of complex international transit systems, "landlocked countries cannot eliminate transit inefficiencies with domestic reforms" (p.61). Indeed, coastal neighbours of the ALOCs are all developing countries and their LPI scores, on average, were also below the world average (Figure 9). Uganda and Burkina Faso had coastal neighbours with relatively better logistics performance, which could be considered as an advantage for their transit trade.

Figure 6: Share of Manufactured Goods in Exports and Imports (2016-2020 average)

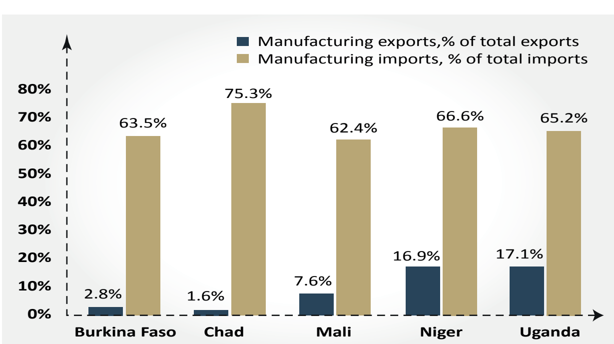
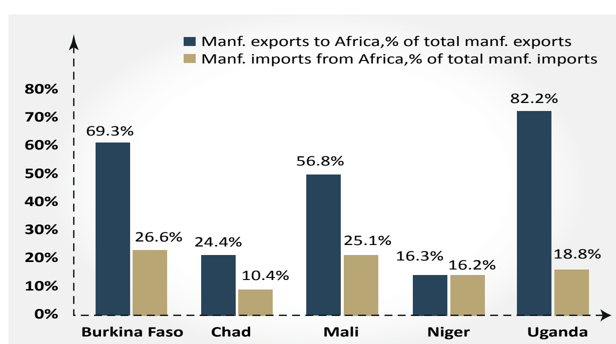
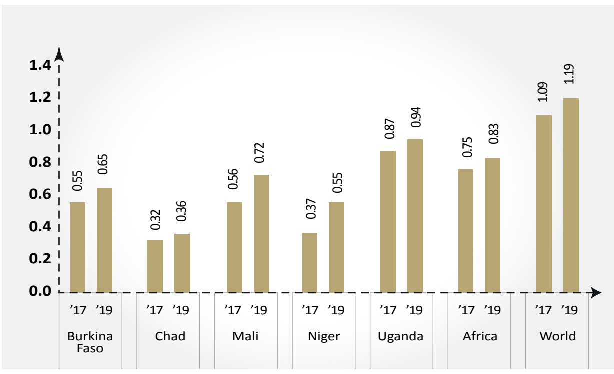


Figure 7: Intra-African Manufacturing Trade (2016-2020 average)



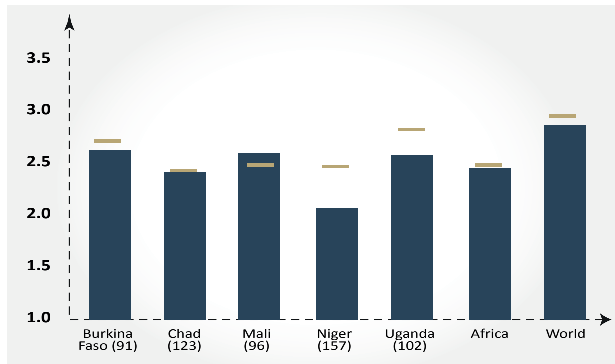
Source: Authors' calculation based on data from the UNCTAD's Data Center.

Figure 8: Average Trade Facilitation Performance*: 2017 vs 2019



Source: OECD, Trade Facilitation.
[https://www.oecd.org/trade/topics/trade-facilitation/]
* The average of the eleven TFIs, which take values from 0 to 2, where 2 designates the best performance that can be achieved. See Annex Table A4 for the performance in the eleven TFIs.

Figure 9: Logistics Performance Index (LPI) 2018



Source: World Bank, https://lpi.worldbank.org/
Note: LPI takes values from 1 to 5, where 5 designates the best performance. The gold lines represent the average LPI score of the neighbouring coastal countries for each ALOC (excluding Tanzania for Uganda), and the average of all coastal countries for Africa and the World. The numbers in parentheses show the country's ranking among the 160 countries covered by the Index.

3. IMPACTS OF TRADE FACILITATION ON TRADE

This section presents the findings of the gravity model estimation under four different categories. The results are presented first on the impacts of trade barriers on trade, which include tariffs and non-tariff measures (NTMs). Estimated impacts of trade facilitation measures are provided next, followed by transport and logistics, and finally business environment. This section also presents the results estimated for landlocked countries as well as the estimated change in exports and imports in five landlocked OIC countries in Africa based on a simulation exercise.

3.1 Market Access

The primary objective of the AfCFTA is to accelerate intra-African trade and boost Africa's trading position in the global market by reducing trade barriers. To this end, the AfCFTA is expected to facilitate, harmonize and better coordinate trade regimes, and eliminate challenges related to overlapping trade agreements across the continent. When assessing the impacts of trade barriers and trade facilitating measures, it is natural to start with the measures restricting the access to markets, namely tariffs and NTBs.

A fall in tariffs and NTBs may result in improvement in trade flows across countries due to reduced trade costs. Estimated by using 3-year interval data during 2006-2018, Table 1 shows the results of the gravity model based on the ordinary least squares (OLS) and Poisson Pseudo Maximum Likelihood (PPML) estimation methods (see Annex II for further details on the methodology). Standard gravity variables have the expected sign and significance in impacting bilateral trade. Landlocked countries (LLCs) tend to export around 60% less than coastal countries.[6] Moreover, a 10% increase in tariffs causes 1.3% fall in exports. When LLCs face an additional 10% tariffs, this would result in 3.6% fall in their exports. Yet, aggravated impacts for LLCs do not hold for the Africa region, where LLCs do not suffer more than coastal countries do, as the estimated coefficient of intra-Africa tariffs to LLCs in Africa is not significant. Moreover, tariffs do not appear to be significantly affecting the trade among African countries.

6 Volume effect of dummy variables is estimated as follows: *[eβdummy -1]x100*. In the case of landlocked countries, it is equal to $[e^{-0.469} - 1] \times 100 = 62.6\%$.

Table 1: Impacts of Tariffs on Trade (3-year intervals during 2006-2018)

	OLS			PPML		
	GLB-1	GLB-2	AFR-1	GLB-3	GLB-4	AFR-2
Distance	-1.415***	-1.415***	-1.545***	-0.714***	-0.716***	-0.927***
	(-58.295)	(-58.315)	(-25.870)	(-22.072)	(-22.399)	(-9.885)
Common Border	0.939***	0.937***	1.658***	0.503***	0.508***	0.881***
	(8.750)	(8.731)	(8.588)	(5.989)	(6.045)	(4.183)
Common Language	0.796***	0.797***	0.571***	0.145**	0.150**	0.594***
	(18.725)	(18.768)	(9.072)	(2.421)	(2.498)	(6.099)
Common Colony	1.004***	1.002***	0.557***	0.391***	0.386***	0.279**
	(16.707)	(16.664)	(7.122)	(3.145)	(3.106)	(2.362)
Common Currency	0.750***	0.746***	0.530***	0.532***	0.524***	-0.230
	(7.231)	(7.190)	(3.653)	(4.480)	(4.435)	(-0.921)
RTA	0.411***	0.411***	0.411***	0.115**	0.116**	0.334***
	(12.604)	(12.612)	(6.804)	(2.168)	(2.197)	(3.331)
Landlocked	-0.727***	-0.721***	-0.663***	-0.469***	-0.385**	-1.418***
	(-8.068)	(-8.003)	(-5.778)	(-2.928)	(-2.300)	(-3.399)
Tariffs	-0.070***	-0.065***	-0.049***	-0.131***	-0.118***	-0.024
	(-5.827)	(-5.217)	(-2.726)	(-5.082)	(-4.603)	(-0.773)
Tariffs to LLCs		-0.028	-0.005		-0.242***	0.104
		(-0.791)	(-0.103)		(-2.597)	(1.347)
Constant	12.055***	12.056***	10.402***	14.367***	14.706***	16.011***
	(24.084)	(24.080)	(4.027)	(17.448)	(18.123)	(9.995)
R^2	0.781	0.781	0.730	0.919	0.920	0.735
N	66,366	66,366	28,017	67,151	67,151	28,646
Fixed effects (exporter, importer and time)	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust and clustered standard errors used to compute t-values, which are reported below each coefficient. All variables except the dummy variables are in logarithms. GLB denotes global sample and AFR denotes African sample. Tariffs is the weighted average of tariffs applied by importer. One (1) has been added to the tariff while taking its logarithm, as zero tariffs would send the log to minus infinity. Tariffs to LLCs is an interaction variable of tariffs multiplied by LLC dummy. MRT denotes multilateral resistance term, RMT denotes remoteness index, FE denotes fixed effect estimation. See Annex II for more detailed information on the methodology. Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01.

This suggests that while exports from LLCs are more severely affected than coastal countries in case of higher tariffs, this does not hold in the case of intra-African trade. Whether landlocked or coastal, higher tariffs are found to be insignificant in impacting the continental trade. This would imply that regional integration in Africa should focus less on tariff reductions and more on trade facilitation. Evidence already indicate that substantial NTBs, regulatory differences and diverging standard requirements keep trade costs in Africa at a level that is significantly higher than the average tariff of 6.9% (Songwe et al., 2021).

Data on non-tariff barriers are not available for a panel data estimation. The aggregate data provided by WITS on the coverage of NTBs enables us only to conduct a cross-sectional estimation. In fact, data limitation persists in all indicators that are used in the following sections, where the empirical findings are presented based on only single year cross-country estimations due to lack of data. Based on 2016 data, the estimation reveals that as the coverage of NTBs increases by 10%, exports falls by 2.3% (c. RMT-2). This makes the NTBs an equally significant barrier to trade (Table 2).

Table 2: Impacts of Tariffs and NTBs on Trade (2016)

	OLS			PPML		Heckman	
	No MRT	RMT-1	FE-1	RMT-2	FE-2	RMT-3	FE-3
Tariffs	-0.387***	-0.283***	-0.081***	**-0.232*** **	**-0.070** **	-0.280***	-0.077***
	(-11.817)	(-8.840)	(-3.732)	(-2.685)	(-2.058)	(-8.387)	(-3.776)
Non-Tariff Barriers	-0.196***	-0.188***		**-0.233*** **		-0.181***	
	(-4.324)	(-4.091)		(-2.854)		(-3.720)	
R^2	0.653	0.670	0.796	0.796	0.946		
N	5,312	5,312	12,947	5,344	13,047	5,531	13,571

Notes: Robust and clustered standard errors used to compute t-values, which are reported below each coefficient. All variables except the dummy variables are in logarithms. GLB denotes global sample and AFR denotes African sample. Tariffs is the weighted average of tariffs applied by importer. One (1) has been added to the tariff while taking its logarithm, as zero tariffs would send the log to minus infinity. Tariffs to LLCs is an interaction variable of tariffs multiplied by LLC dummy. MRT denotes multilateral resistance term, RMT denotes remoteness index, FE denotes fixed effect estimation. See Annex II for more detailed information on the methodology. Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01.

An indicator on market access developed by the World Economic Forum (WEF) is used to complement the assessment on the impact of trade barriers. The Market Access indicator of WEF consists of both domestic and foreign market access components, which assesses not only the level of tariff protection, but also the complexity of it. Estimation results based on WEF market access indicator reveal that an improvement in market access by exporter or importer has significant positive impacts on trade. Estimation with the African sample, on the other hand, does not yield a significant result, denying once again the importance of tariff protections to African trade (Table 3).

Although it is early at this stage to comment, these results may be pointing to the relatively greater importance of trade facilitation than trade protectionism (or tariffs) in improving trade linkages within Africa. The following sections investigate the possible impacts of various dimensions of trade facilitation and trade related infrastructure and provide further insights on the relative importance of such policies.

3.2 Trade Facilitation

COVID-19-induced disruptions to trade since early 2020 have highlighted the importance of trade facilitation. The rise of e-commerce and the growing numbers of parcels crossing international borders is both increasing demand, and creating new challenges, for trade facilitation. Some definitions limit trade facilitation to improvements in trade procedures, while other definitions of trade facilitation include investments in hard infrastructure such as ports, transportation links as well as information and communications technology (WTO, 2015). Since trade facilitation policies related to logistics and transport infrastructure are evaluated separately, this section focuses only on 'soft' measures that aim to enhance trade by improving efficiency, transparency and governance.

The impacts of trade facilitation on trade is estimated with the Trade Facilitation Indicators (TFIs) of OECD by using the annual data for 2017. As reported in Table 4, trade facilitation appears to be a strong policy dimension in improving trade linkages. While trade facilitation by exporter countries increases trade significantly, it would increase at even higher levels if implemented by importer countries. Smaller sample with African countries provides similar significant results, where 10% improvement in overall trade facilitation by exporter would increase exports by 5.7%, but trade facilitation by exporter countries in Africa is found to be more important than trade facilitation by importer countries in increasing manufacturing exports.

Table 3: Impacts of Tariffs and NTBs on Trade (2016)

	Global Sample	African Sample
Market Access - Exporter	**0.809*****	**0.257**
	(2.696)	(0.797)
Market Access - Importer	**1.243*****	**0.025**
	(6.224)	(0.062)
R^2	0.714	0.394
N	13,266	5,505

Notes: Robust and clustered standard errors used to compute t-values, which are reported below each coefficient, estimated by PPML estimator. The results for standard gravity variables are not reported, which include distance, common border, common language, common colony, common currency, RTA and landlocked dummies. All variables except the dummy variables are in logarithms. Data corresponds to the year 2016. Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01.

Table 4: Impacts of Trade Facilitation on Trade (2017)

	Global Sample	African Sample
Distance	-0.817***	-0.866***
	(-17.419)	(-6.383)
Common Border	0.490***	0.349
	(4.486)	(0.863)
Common Language	0.134	0.221*
	(1.387)	(1.722)
Common Colony	0.633***	0.673***
	(3.012)	(3.785)
Common Currency	0.213**	0.323
	(2.230)	(1.302)
RTA	0.164**	0.557***
	(2.079)	(3.570)
Landlocked	0.053	-0.295***
	(0.728)	(-2.705)
GDP - Exporter	0.795***	0.804***
	(22.552)	(18.039)
GDP - Importer	0.708***	0.707***
	(20.772)	(15.929)
Trade Facilitation - Exporter	**0.565****	**0.567****
	(2.384)	(2.416)
Trade Facilitation - Importer	**0.909+**	**0.371****
	(5.398)	(2.140)
Remoteness - Exporter	0.739***	1.101***
	(6.613)	(4.944)
Remoteness - Importer	0.577***	0.318
	(5.478)	(1.133)
Constant	-38.920***	-40.977***
	(-12.450)	(-4.758)
R^2	0.675	0.407
N	15,395	6,961

Notes: Robust and clustered standard errors used to compute t-values, which are reported below each coefficient, estimated by PPML estimator. All variables except the dummy variables are in logarithms. Data corresponds to the year 2017. Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01.

Facilitating Payment in Africa

Findings indicate that having a common currency would significantly contribute to the development of trade. Although a common currency across the continent is not expected in the foreseeable future, there are efforts towards facilitating payments across borders, such as of the Pan-African Payment and Settlement System (PAPSS). Considering the 42 currencies being currently used in Africa, introduction of the PAPSS in 2022 is expected to reduce the cost of currency convertibility, which is estimated to be about $5 billion annually. On another front, considering the costly process of traditional dispute settlement mechanisms, the use of online mechanism can make dispute settlement more affordable and inclusive.

OECD TFI is calculated based on 11 subcategories of trade facilitation. While it has significant impacts at aggregate level, it is more insightful to see how different components of trade facilitation can contribute to trade among countries (see Table A2 on the subcategories of TFI and their short description). Table 5 presents the results for each component of trade facilitation.[7] Improved access to trade-related information has no significant impact on exporter side, but it increases exports if importer countries make it available to traders, which is in turn not found to be significant in the case of African countries. In terms of advance rulings[8], there are significant and positive impacts when applied by both exporter and importer, which is slightly lower in the case of African countries.

If there are appeal procedures (the possibility and modalities to appeal administrative decisions by border agencies) in importing countries, there is a greater likelihood to export. It appears to be negative for African exporters, which can be explained by costly and inefficient appeal procedures. While the lengthy process of dispute settlement can impede trade, efficiency in appeal procedures and dispute settlement can make significant improvements in trade. Disciplines on the fees and charges imposed on imports and exports by exporters and importers are positive stimulators of exports, which is not significant in the case of African countries. On the other hand, formalities in relation to documents and their harmonisation in accordance with international standards improve trade, as estimated in both samples.

Improved automation within the context of electronic exchange of data, use of automated risk management, automated border procedures and electronic payments again significantly contribute to the improvement of bilateral trade. One of the most significantly contributing component of trade facilitation is formalities related to procedures. Streamlining of border controls, single windows systems, post-clearance audits and authorised operators would result in the highest positive impact in the case of African countries. An interesting observation is that internal and external border agency cooperation does not provide a positive significant stimulus to bilateral exports in Africa, but they only improve trade if implemented by importing countries. Finally, if exporting countries improve their customs structures and functions, accountability and ethics policy, they would also able to export greater amounts of manufacturing products.

The assessment of trade facilitation components reveal important insights. Almost all components are found to have significant positive impact on trade flows, with particularly strong impacts in formalities and advance rulings. Formalities related to procedures stand as the most critical trade facilitation policy, as estimated in both global and African sample. It is, however, somewhat surprising that internal border agency cooperation as well as cooperation with transit and partner countries have no significant positive impact on Africa's trade.

[7] The results for the "Involvement of the Trade Community" subcategory are omitted due to its relative insignificance for the development of trade.

[8] An advance ruling is a written decision provided by a Member to an applicant prior to the importation of a good covered by the application that sets forth the treatment that the Member shall provide to the good at the time of importation with regard to the good's tariff classification, and the origin of the good (OECD, n.d.).

Table 5: Impacts of Specific Components of Trade Facilitation on Trade (2017)

	Global Sample	African Sample	Global Sample	African Sample
	A. Information Availability		F. Formalities – Automation	
Exporter	**0.170**	**0.133**	**0.367****	**0.380*****
	(0.818)	(0.634)	(2.408)	(3.348)
Importer	**0.868*****	**0.202**	**0.513*****	**0.123**
	(4.440)	(1.631)	(5.552)	(1.587)
	0.675	0.401	0.678	0.415
	B. Advance Rulings		G. Formalities – Procedures	
Exporter	**0.811*****	**0.512*****	**0.698*****	**0.768*****
	(6.419)	(3.028)	(3.157)	(3.137)
Importer	**0.403*****	**0.278****	**0.824*****	**0.531****
	(3.440)	(2.208)	(5.714)	(2.571)
R^2	0.665	0.420	0.659	0.409
	C. Appeal procedures		H. Internal Border Agency Cooperation	
Exporter	**0.114**	**-0.300****	**0.018**	**-0.330****
	(0.623)	(-2.412)	(0.122)	(-2.258)
Importer	**0.671*****	**0.065**	**0.473*****	**-0.101**
	(3.754)	(0.713)	(3.879)	(-0.891)
R^2	0.673	0.407	0.686	0.422
	D. Fees and Charges		I. External Border Agency Cooperation	
Exporter	**0.796*****	**0.342**	**0.136**	**0.152**
	(3.419)	(1.305)	(1.233)	(1.314)
Importer	**0.847*****	**0.083**	**0.266*****	**0.117**
	(3.991)	(0.393)	(3.668)	(1.002)
R^2	0.675	0.403	0.669	0.405
	E. Formalities – Documents		**J. Governance & Impartiality**	
Exporter	**0.515*****	**0.688*****	**0.390*****	**0.449*****
	(3.851)	(5.387)	(2.750)	(3.508)
Importer	**0.575*****	**0.400*****	**0.241*****	**0.121**
	(5.801)	(3.605)	(2.817)	(1.592)
R^2	0.673	0.427	0.663	0.423
N	15,395	6,961	15,395	6,961

Notes: Robust and clustered standard errors used to compute t-values, which are reported below each coefficient, estimated by PPML estimator. The results for standard gravity variables are not reported, which include distance, common border, common language, common colony, common currency, RTA and landlocked dummies. All variables except the dummy variables are in logarithms. The results are estimated for each component of TFI separately. Data corresponds to the year 2017. Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01.

Importance of Information Availability

Among the critical components of trade facilitation, improving information availability would significantly contribute to the development of trade. In this connection, the African Trade Observatory fulfils an important role as a repository of trade information that allows to monitor the trade integration in Africa. Such information could also reduce the experimental costs of firms entering a new export market and support exporting firms in destination markets, especially when we consider that the average survival rate of African exporters in African markets is only 24% in their first year and 10% in their second year (UNCTAD, 2021). It is also noteworthy to mention that only 25% of micro, small and medium-sized enterprises in Nigeria were aware of the AfCFTA (Madden, 2021). This share is as low as 3% among the firms operating in the agricultural sector.

3.3 Logistics Performance

While 'soft' trade facilitation policies can significantly contribute to the expansion of intra-African trade, better transport services can provide additional gains by reducing trade costs, increasing connectivity and improving predictability. Impacts of transport services are estimated by using logistics performance index (LPI) of the World Bank for the year 2018 and the results are presented in Table 6. Again standard gravity variables have the expected signs and significance in affecting the bilateral trade flows. The overall LPI index has a positive and significant impact in improving manufacturing trade. A 10% increase in the LPI performance of exporters (importers) would increase exports by around 17% (15%). This impact is found to be much stronger in the case of Africa, where the growth in exports would exceed 23% (20%) following a 10% increase in LPI performance.

The LPI is a summary indicator of logistics sector performance, combining data on six core performance components into a single aggregate measure (Arvis et al. 2014). Table 7 shows the estimated impacts of different components of logistics performance on trade flows. An improvement in the efficiency of customs and border clearance leads to higher trade flows and this impact is stronger in the case of African countries. The quality of trade and transport infrastructure has similar impacts in expanding trade flows. The highest impact among other components of the LPI is observed in the case of the ease of arranging competitively priced international shipments. African exporters would expand their trade by 36% if they increase their capacity to arrange competitive international shipments by 10%.

The competence and quality of logistics services as well as the ability to track and trace consignments can significantly contribute to the expansion of trade. Finally, the frequency with which shipments reach consignees within scheduled or expected delivery times emerges as the second most critical components of logistics performance, where a 10% improvement on the exporter side can rise exports by 19% as estimated in the global sample, or 27% as estimated in the sample of African countries only.

Table 6: Impacts of Logistics Performance on Trade (2018)

	Global Sample	African Sample
Distance	-0.756+	-0.975+
	(-16.374)	(-7.398)
Common Border	0.590+	0.104
	(5.007)	(0.210)
Common Language	0.066	0.213
	(0.689)	(1.597)
Common Colony	0.532+	0.777+
	(3.401)	(4.057)
Common Currency	0.460+	0.488*
	(5.298)	(1.717)
RTA	0.202***	0.384***
	(2.678)	(2.894)
Landlocked	-0.000	-0.211*
	(-0.001)	(-1.693)
GDP - Exporter	0.751+	0.743+
	(22.101)	(16.406)
GDP - Importer	0.687+	0.699+
	(17.235)	(14.327)
LPI - Exporter	**1.704+**	**2.373+**
	(5.719)	(6.109)
LPI - Importer	**1.526+**	**2.019+**
	(5.751)	(4.203)
Remoteness - Exporter	0.770+	1.265+
	(6.924)	(5.849)
Remoteness - Importer	0.640+	0.289
	(6.075)	(1.054)
Constant	-43.675+	-46.344+
	(-13.765)	(-5.769)
R^2	0.670	0.443
N	15,607	6,583

Notes: Robust and clustered standard errors used to compute t-values, which are reported below each coefficient, estimated by PPML estimator. All variables except the dummy variables are in logarithms. Data corresponds to the year 2018. Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01.

Table 7: Impacts of LPI Components on Trade (2018)

	Global Sample	African Sample	Global Sample	African Sample	Global Sample	African Sample
	A. Customs		C. International Shipments		E. Tracking and Tracing	
Exporter	**0.990*****	**1.526*****	**2.947*****	**3.603*****	**1.374*****	**1.463*****
	(4.033)	(4.898)	(10.913)	(10.150)	(4.387)	(3.992)
Importer	**1.122*****	**1.268*****	**1.784*****	**2.197*****	**1.415*****	**1.224*****
	(5.276)	(3.321)	(5.961)	(5.354)	(5.671)	(3.167)
R^2	0.669	0.423	0.689	0.524	0.669	0.417
	B. Infrastructure		D. Logistics Quality and Competence		F. Timeliness	
Exporter	**1.202*****	**1.231*****	**1.592*****	**1.716*****	**1.904*****	**2.661*****
	(4.813)	(3.760)	(5.780)	(5.013)	(5.576)	(5.639)
Importer	**1.105*****	**1.357*****	**1.328*****	**1.484*****	**1.757*****	**2.403*****
	(5.107)	(3.253)	(5.630)	(3.512)	(5.815)	(4.624)
R^2	0.667	0.421	0.666	0.426	0.671	0.445
N	15,607	6,583	15,607	6,583	15,607	6,583

Notes: Robust and clustered standard errors used to compute t-values, which are reported below each coefficient, estimated by PPML estimator. The results for standard gravity variables are not reported, which include distance, common border, common language, common colony, common currency, RTA and landlocked dummies. All variables except the dummy variables are in logarithms. The results are estimated for each component of LPI separately. Data corresponds to the year 2018. Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01.

Overall, logistics performance appear to generate significant improvements in trade flows. It is noteworthy to highlight that the growth in trade is estimated to be larger in Africa as logistics performance appear to be a critical determinant of bilateral trade within the continent. Probably due to its direct linkages with export performance, LPI and its subcomponents have significantly higher impacts than TFI and its subcomponents presented in the previous section.

3.4 Transport Infrastructure and Business Environment

Benefiting from the World Economic Forum's Enabling Trade Index (ETI), a few additional dimensions are included in the analysis in order to complement the previous analysis on trade facilitation. The ETI has components related to market access (see section 3.1), efficiency and transparency of border administration, availability and quality of transport infrastructure, availability and quality of transport services, availability and use of ICTs, and operating environment. Selected components of the ETI are estimated by using the annual data for 2016, the latest year available for the ETI index. Once again, the standard gravity variables have the expected signs and significance when estimated with ETI index for the year 2016, as reported in Table 8.

As evidenced earlier, trade facilitation has again positive significant impact on trade flows, as measured by ETI. A 10% increase by exporters in their ETI scores would lead to 10% increase in their exports, but this impact is stronger in the case of African countries (16%). There are also important benefits on the importers side, where a 10% improvement in importers' ETI score would result in an increase in exports to that country by 19%. This impact is somewhat lower in the case of Africa, but it is still strong with almost 15%.

There are five separate pillars of ETI other than the market access that is discussed earlier. The results on the impacts of three pillars are presented in Table 9. The availability and quality of domestic infrastructure covers the scores for each of the four main modes of transport (road, air, railroad and seaport) as well as air connectivity and sea line connectivity. The scope of this index is similar to the infrastructure component of LPI, and the findings are also similar. Availability and quality of infrastructure positively affects the trade flows and this effect is stronger in the case of African countries. Better infrastructure in importing countries also spurs export to these countries. Another pillar on border administration assesses the efficiency, transparency and costs associated with importing and exporting goods. This is also akin to different components of LPI and TFI discussed above, but this one is a more composite form of 13 sub-indicators related to time, costs, and other procedures related to exports and imports. As evidenced earlier, more efficient border administration improves the trade linkages, particularly when implemented by exporting countries in the case of African countries.

A final pillar is operating environment, which assesses a wide range of issues related to the quality of a country's operating environment in doing business. This includes, amongst others, a country's level of protection of property rights, the quality and impartiality of its public institutions, efficiency in enforcing contracts, the availability of finance, and openness to foreign participation in terms of foreign investments and labour (WEF and GATF, 2016). It has again positive impact on trade flows, where the impact is stronger if implemented by exporters in the African continent.

Reassessment of various trade facilitation indicators under different categorization provided by WEF only confirms the previous findings where trade facilitation has a significant positive impact on exports of manufacturing goods. It is not surprising to observe that African countries would attain higher benefits from implementing various trade facilitation policies. This is also in line with the findings of Portugal-Perez and Wilson (2012), who show that trade facilitation reforms do improve the export performance of developing countries. This is particularly true with investment in physical infrastructure and regulatory reform to improve the business environment. They also found that if infrastructure quality and business environment in Chad would be improved halfway to the level of South Africa, trade levels of the former would increase by 79% and 113%, respectively, reflecting the significant trade gains for sub-Saharan African countries.

3.5 Trade Facilitation in Landlocked Countries

The analyses made above ignored the special case of landlocked countries (LLCs), which face greater challenges in export and import of goods due to lack of connectivity. Lack of access to seaports increases the reliance on transit countries in realizing timely and efficient transportation of goods. Moreover, coordination problems among border agencies, the lack of reliable transport systems, high logistics costs, poor infrastructure, and dependency on the infrastructure of transit countries constitute some other challenges faced by LLCs. Although the estimated models included a separate variable for LLCs, which were found to be all negative and significant, no separate analysis were made in relation with trade facilitation indicators in these countries. In this connection, this section extends the analyses made earlier in order to see if LLCs accrue any additional benefit from implementing various trade facilitation policies.

Table 10 presents the results in the case of OECD's TFIs for exporting LLCs. It is critical to observe that in all nine sub-indices of the TFI, there would be additional trade gains for landlocked countries from implementing various trade policies.[9] For some variables, such as information availability, internal and external border agency cooperation, even though they were not significantly contributing to the development of trade as estimated in the global sample, there are significant gains for LLCs. Probably the most striking evidence is that internal cooperation as well as external border agency cooperation with transit and partner countries have significant positive impacts on export flows from landlocked countries. Moreover, the benefits from trade facilitation almost double for LLCs on all other indicators.

Table 8: Impacts of Trade Facilitation on Trade based on ETI (2016)

	Global Sample	African Sample
Distance	-0.734***	-0.842***
	(-15.741)	(-5.646)
Common Border	0.573***	0.250
	(5.131)	(0.466)
Common Language	0.090	0.118
	(0.966)	(0.788)
Common Colony	0.562***	0.688***
	(3.284)	(3.658)
Common Currency	0.241**	0.373
	(2.134)	(1.360)
RTA	0.234***	0.436**
	(3.105)	(2.524)
Landlocked	0.034	-0.325***
	(0.434)	(-2.577)
GDP - Exporter	0.805***	0.802***
	(29.003)	(20.861)
GDP - Importer	0.719***	0.690***
	(21.841)	(14.763)
ETI - Exporter	**1.016*** **	**1.569*** **
	(3.124)	(3.777)
ETI - Importer	**1.910*** **	**1.460*** **
	(6.300)	(3.123)
Remoteness - Exporter	0.736***	1.203***
	(7.015)	(5.205)
Remoteness - Importer	0.568***	0.299
	(5.449)	(0.883)
Constant	-44.011***	-46.959***
	(-13.893)	(-4.732)
R^2	0.708	0.392
N	13,266	5,505

Notes: Robust and clustered standard errors used to compute t-values, which are reported below each coefficient, estimated by PPML estimator. All variables except the dummy variables are in logarithms. Data corresponds to the year 2016. Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01.

[9] The results for the "involvement of the trade community" and "appeal procedures" subcategories are omitted.

Table 9: Impacts of Specific Pillars of ETI on Trade (2016)

	Global Sample	African Sample	Global Sample	African Sample	Global Sample	African Sample
	A. Availability and Quality of Transport Infrastructure		B. Efficiency and Transparency of Border Administration		C. Operating Environment	
Exporter	0.987***	2.047***	0.791***	1.393***	0.656**	0.983***
	(5.522)	(7.979)	(3.040)	(4.838)	(2.554)	(2.623)
Importer	1.379***	1.724***	1.207***	0.981***	1.660***	1.614***
	(6.096)	(5.320)	(5.390)	(3.434)	(5.720)	(3.303)
R^2	0.692	0.441	0.692	0.401	0.703	0.386
N	13,266	5,505	13,266	5,505	13,266	5,505

Notes: Robust and clustered standard errors used to compute t-values, which are reported below each coefficient. The results for standard gravity variables are not reported, which include distance, common border, common language, common colony, common currency, RTA and landlocked dummies. All variables except the dummy variables are in logarithms. Data corresponds to the year 2016. Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01.

Table 10: Impacts of Trade Facilitation in Landlocked Countries on Trade based on TFI (2017)

	PPML - 1	PPML - 2	PPML - 1	PPML - 2	PPML - 1	PPML - 2
	A. Information Availability		D. Formalities – Documents		G. Internal Border Agency Cooperation	
Exporter	0.170	0.093	0.515***	0.473***	0.018	-0.024
	(0.818)	(0.425)	(3.851)	(3.332)	(0.122)	(-0.162)
Exporter * Landlocked		**0.609*** **		**0.395** **		**0.708*** **
		(2.816)		(2.093)		(4.445)
Importer	0.868***	0.857***	0.575***	0.570***	0.473***	0.476***
	(4.440)	(4.421)	(5.801)	(5.777)	(3.879)	(3.902)
R^2	0.675	0.676	0.673	0.674	0.686	0.688
	B. Advance Rulings		E. Formalities – Automation		H. External Border Agency Cooperation	
Exporter	0.811***	0.765***	0.367**	0.321**	0.136	0.101
	(6.419)	(5.864)	(2.408)	(2.029)	(1.233)	(0.904)
Exporter * Landlocked		**0.427** **		**0.515*** **		**0.839*** **
		(2.073)		(2.582)		(4.950)
Importer	0.403***	0.410***	0.513***	0.512***	0.266***	0.265***
	(3.440)	(3.500)	(5.552)	(5.572)	(3.668)	(3.662)
R^2	0.665	0.666	0.678	0.678	0.669	0.670
	C. Fees and Charges		F. Formalities – Procedures		I. Governance & Impartiality	
Exporter	0.796***	0.757***	0.698***	0.636***	0.390***	0.319*
	(3.419)	(3.205)	(3.157)	(2.784)	(2.750)	(1.958)
Exporter * Landlocked		**0.565*** **		**0.801*** **		**0.361** **
		(2.788)		(3.012)		(2.022)
Importer	0.847***	0.829***	0.824***	0.814***	0.241***	0.235***
	(3.991)	(3.972)	(5.714)	(5.683)	(2.817)	(2.743)
R^2	0.675	0.674	0.659	0.660	0.663	0.663
N	15,395	15,395	15,395	15,395	15,395	15,395

Notes: Robust and clustered standard errors used to compute t-values, which are reported below each coefficient, estimated by PPML estimator. See Annex II for further details on the methodology. The results for standard gravity variables are not reported, which include distance, common border, common language, common colony, common currency, RTA and landlocked dummies. All variables except the dummy variables are in logarithms. The results are estimated for each component of TFI separately. The extended PPML estimator (PPML-2) includes additionally an indicator variable (Exporter*Landlocked) presenting the additional impact for landlocked exporting countries. Data corresponds to the year 2017. Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01.

A separate experiment was conducted by using the World Bank's LPI. Contrary to the direct trade facilitation measures related to formalities, cooperation and governance, the trade facilitation measures related to transport infrastructure and capacities do not have any additional importance in LLCs as compared to coastal countries (Table 11). The only exception is the component of LPI related to customs, which generates additional benefits for LLCs. Efficiency of customs and border clearance has lower association with transport infrastructure than other LPI components do and it does not require LLCs to make huge investments in infrastructure capacities to accrue additional gains. It is also akin to OECD TFIs.

Table 11: Impacts of Trade Facilitation in Landlocked Countries on Trade based on LPI (2018)

	PPML - 1	PPML - 2	PPML - 1	PPML - 2	PPML - 1	PPML - 2
	A. Customs		C. International Shipments		E. Tracking and Tracing	
Exporter	0.990***	0.970***	2.947***	2.920***	1.374***	1.333***
	(4.033)	(3.915)	(10.913)	(10.746)	(4.387)	(4.186)
Exporter * Landlocked		**0.192***		**0.137**		**0.159**
		(1.882)		(1.547)		(1.612)
Importer	1.122***	1.131***	1.784***	1.795***	1.415***	1.436***
	(5.276)	(5.337)	(5.961)	(6.000)	(5.671)	(5.718)
R^2	0.669	0.669	0.689	0.689	0.669	0.669
	B. Infrastructure		D. Logistics Quality and Competence		F. Timeliness	
Exporter	1.202***	1.170***	1.592***	1.563***	1.904***	1.871***
	(4.813)	(4.620)	(5.780)	(5.606)	(5.576)	(5.422)
Exporter * Landlocked		**0.155**		**0.154**		**0.147**
		(1.580)		(1.625)		(1.606)
Importer	1.105***	1.121***	1.328***	1.342***	1.757***	1.775***
	(5.107)	(5.161)	(5.630)	(5.671)	(5.815)	(5.863)
R^2	0.667	0.667	0.666	0.666	0.671	0.671
N	15,607	15,607	15,607	15,607	15,607	15,607

Notes: Robust and clustered standard errors used to compute t-values, which are reported below each coefficient, estimated by PPML estimator. See Annex II for further details on the methodology. The results for standard gravity variables are not reported, which include distance, common border, common language, common colony, common currency, RTA and landlocked dummies. All variables except the dummy variables are in logarithms. The results are estimated for each component of LPI separately. The extended PPML estimator (PPML-2) includes additionally an indicator variable (Exporter*Landlocked) presenting the additional impact for landlocked exporting countries. Data corresponds to the year 2018. Significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01.

This exercise shows that there are additional benefits of trade facilitation for LLCs. These benefits are mostly related to facilitation measures associated with efficiency of operations with reduced formalities and greater collaboration with transit and partner countries. Improved capacity in logistics infrastructure does not provide extra gains for LLCs. Considering the fact that many African landlocked countries lack the resources for new investment in logistics infrastructure, these findings present important opportunities for expanding trade by concentrating on low-cost, efficiency enhancing trade facilitation policies. This may require building human and institutional capacities of related authorities, which is to be complemented with associated technology transfer for improved efficiency.

3.6 What-if Scenarios

The analyses made until now clearly highlight the significant gains to be accrued from trade facilitation measures. In majority of cases, the estimated benefits for African countries surpasses the ones for the rest of the world. Moreover, there are additional benefits for landlocked countries if they improve their efficiency and partnership for trade activities. Based on these results, it is possible to quantify the effects of improvements in trade facilitation on selected countries. Accordingly, we will assess the potential benefits for five selected landlocked African countries based on the estimations derived from improving the overall OECD-TFI and WB-LPI as well as from improving their sub-components in order to inform policymakers about possible gains from implementing alternative trade facilitation measures.

Following Wilson et al. (2003), the experiment is designed in a way that accounts for differential potential for improvement for different countries. Applying a common percentage improvement to each trade facilitation indicator for all countries would require an improvement even in best performing countries. Accordingly, the estimated gains are calculated by artificially increasing their index scores to the level of average performing country in the sample. Since the five landlocked African OIC countries are already below-average in most of the indicators, this is a reasonable approach to follow. The estimated gains in trade are calculated by improving a country's trade facilitation performance as an exporter or importer.

As shown earlier, the performance of five OIC countries in OECD TFIs are comparably low, even mostly below the average of African countries. Therefore, increasing their performance levels to the levels of the world average would generate enormous gains. To make it more realistic, the simulation in the case of TFIs is conducted by artificially increasing their index values to the average level of the African countries in the sample. In few cases where some OIC countries have already above the continental averages, the gains are not estimated and left as zero. Accordingly, overall improvement of TFI would enhance exports by 7.1% in Burkina Faso, 22% in Mali and 70.7% in Niger (Table 12). The gain would be extremely huge in the case of Chad, as the initial values are very low (see Figure 8). Improvements in formalities have approximately similar impact on exports and imports, but information availability and appeal procedures would ease the trade into the concerned countries more.

Table 12: Gains in Trade from Improvements in TFIs based on Standard Estimation (2017)

	Burkina Faso		Chad		Mali		Niger		Uganda	
	Export	Import	Export	Import	Export	Import	Export	Import	Export	Import
Trade Facilitation – Overall Index	7.1	38.4	371.4	130.2	22.0	36.1	70.7	100.9	0	0
Information availability	2.1*	10.9	111.9*	570.6	6.6*	33.7	21.3*	108.7	0	0
Advance rulings	84.1	41.7	--	--	84.1	41.7	--	--	1.6	0.8
Appeal procedures	20.6*	120.9	81.5*	477.9	2.4*	14.3	60.0*	352.2	0	0
Fees and charges	15.0	16.0	30.4	32.3	23.2	24.7	30.4	32.3	0	0
Formalities – documents	54.8	61.2	54.8	61.2	2.4	2.6	12.6	14.1	29.3	32.7
Formalities – automation	20.6	28.8	112.3	156.9	94.7	132.4	60.4	84.5	0	0
Formalities – procedures	0	0	60.6	71.6	27.5	32.5	60.6	71.6	0	0
Internal co-operation	1.8*	47.7	0.9*	24.0	0	0	3.5*	95.2	0	0
External co-operation	3.0*	5.9	1.7*	3.3	14.7*	28.9	28.9*	56.6	0	0
Governance & impartiality	0	0	--	--	14.7	9.1	--	--	192.4	118.9

Note: Values with asterisk are not statistically significant. Changes in trade for countries with zero initial values are not calculated and indicated with (--). Changes in trade for countries with index values above the African average are not calculated and left as zero.

As presented in Table 10, the landlocked countries would benefit more from the improvements in trade facilitation as compared to coastal countries. When the simulation is conducted based on the findings of this estimation, the results presented in Table 12 would improve even further and all findings would be statistically significant. In that case, an improvement in TFI to the average level of African countries would generate the largest benefit for Chad and Niger. Burkina Faso would benefit most from the improvements in advance rulings and formalities related to documents. Chad would benefit most from the improvements in information availability, appeal procedures and formalities related to automation. Gains for Mali would come mostly from formalities related to automation and advance ruling. In Niger, these policy areas would be appeal procedures, external and internal border agency cooperation, and formalities related to automation and procedures. Since Uganda already performs above the African average in many indicators, it would attain significant benefits by improving governance and impartiality related to customs structures and functions (Table 13).

Table 13: Gains in Trade from Improvements in TFIs based on Extended Estimation (2017)

	Burkina Faso		Chad		Mali		Niger		Uganda	
	Export	Import	Export	Import	Export	Import	Export	Import	Export	Import
Trade Facilitation – Overall Index	53.1	39.1	179.9	132.5	49.9	36.7	139.5	102.7	0	0
Information availability	7.7	7.0	400.3	366.0	23.7	21.6	76.2	69.7	0	0
Advance rulings	123.6	42.4	--	--	123.6	42.4	--	--	2.4	0.8
Appeal procedures	132.9	122.0	525.6	482.5	15.7	14.4	387.3	355.6	0	0
Fees and charges	24.9	16.3	50.5	32.9	38.6	25.2	50.5	32.9	0	0
Formalities – documents	92.4	39.6	92.4	39.6	4.0	1.7	21.3	9.1	49.4	21.2
Formalities – automation	46.9	29.9	255.6	162.9	215.7	137.5	137.6	87.7	0	0
Formalities – procedures	0	0	124.8	72.9	56.7	33.1	124.8	72.9	0	0
Internal co-operation	71.5	47.7	35.9	23.9	0	0	142.6	95.1	0	0
External co-operation	18.7	5.8	10.5	3.2	90.9	28.0	178.2	55.0	0	0
Governance & impartiality	0	0	--	--	25.7	9.9	--	--	335.5	129.4

Note: Values with asterisk are not statistically significant. Changes in trade for countries with zero initial values are not calculated and indicated with (--). Changes in trade for countries with index values above the African average are not calculated and left as zero.

A similar exercise can be made in relation with an improvement in logistics performance index and its components. Noting the fact that the average scores of five OIC countries are close to the average of the African countries, the simulation is conducted by improving the LPI scores of OIC countries vis-à-vis the global averages. Associated gains in trade are presented in Table 14. Improvement of overall LPI scores to the global averages would result in close to 20% increase in exports from Burkina Faso, Mali and Uganda. Growth in exports in Niger would reach almost 70%.

Regarding the components of the LPI, Burkina Faso would attain the largest growth in exports via improvements in tracking and tracing (17%), Chad in international shipments (41%), Mali in customs (25%), Niger in international shipments (14%) and Uganda in infrastructure category (28%). Better logistics performance would also lead to higher volume of imports to these countries.

Table 14: Impacts of Trade Facilitation in Landlocked Countries on Trade based on LPI (2018)

	Burkina Faso		Chad		Mali		Niger		Uganda	
	Export	Import	Export	Import	Export	Import	Export	Import	Export	Import
Logistics Performance – Overall Index	18.9	15.5	34.5	28.4	21.1	17.3	69.2	56.9	21.8	18.0
Customs	12.0	12.4	25.4	26.2	25.4	26.2	52.1	53.8	3.5	3.6
Infrastructure	13.5	11.4	16.9	14.2	21.0	17.8	42.2	35.6	28.1	23.7
International Shipments	0	0	41.4	23.9	0.3	0.2	103.5	59.8	0	0
Logistics Quality and Competence	15.7	12.0	5.0	3.8	16.4	12.5	45.7	34.9	12.9	9.9
Tracking and Tracing	17.3	16.3	19.3	18.1	0	0	29.9	28.1	16.7	15.7
Timeliness	0	0	6.0	5.1	0	0	30.4	25.6	0	0

Note: All values are statistically significant. Changes in trade for countries with index values above the world average are not calculated and left as zero.

4. FINAL REMARKS AND POLICY RECOMMENDATIONS

The AfCFTA offers a great potential and unprecedented opportunities to transform African economies, enhance their economic integration, and raise their collective share in global trade. While elimination of tariffs on majority of products in continental trade will foster trade, it will not be enough to realize the full potential. High number of documentation requirements and formalities, inefficient customs processes, inadequate port infrastructure, and lack of quality port services are some of the factors making trade more costly and cumbersome. Complementary policies are needed to reduce structural barriers to trade, and foster trust, transparency and partnership within the continent. In this connection, this study investigated the potential gains for the five landlocked African OIC countries against an improvement in their trade facilitation performance.

By employing a diverse set of data and methodology, it is found that there are significant gains from trade facilitation and improved logistics infrastructure. This benefit is significantly higher in the case of African countries. While infrastructure investments in logistics generate the largest gains, landlocked countries can attain additional gains from efficiency improvements in trade facilitation measures. Nevertheless, aggregate impact of logistics performance remain significantly higher than the impacts of soft trade facilitation measures in both landlocked and coastal countries. Using alternative indices and their components for different years enables policymakers to judge on the comparative importance of various types of trade facilitation policies and associated gains in increasing trade flows. Analyses reveal that five landlocked OIC countries would benefit more from trade facilitating measures, particularly related to appeal procedures, information availability, and formalities related to automation and procedures. There are also benefits associated with improvements related to logistics performance, especially in the case of Niger.

While considering the findings of this study, it is useful to keep in mind that the estimated effects may be amplified or offset by other factors that are not included in the model. However, the findings reiterate the fact that trade costs are a major factor in affecting the world trade and any meaningful reduction in trade costs would help to improve trade flows and economic integration among countries. Landlocked countries in Africa face significant barriers to trade, but many of them would be eliminated with adequate investment in human, institutional and technological capacities, improving governance and cooperating with external border agencies. Moreover, building physical infrastructure for trade and transport corridors would support socioeconomic development across the continent.

The digitalization of trade and the promotion of paperless trading systems, which has already gained importance during the COVID-19 pandemic, has also significant potential to support traders and should be among the priority objectives of policymakers. Fully automated customs and clearance processes would allow for speedy processing of goods in transit and destination countries. In Uganda, for example, the creation of one-stop points and electronic single windows are expected to reduce the amount of paperwork required and may reduce the time required and transaction costs by 30% (ITC, 2018). In Senegal, perhaps more strikingly, the digitalization of customs procedures has reduced the time required for the registration of customs declarations from 2 days to 15 minutes; for pre-clearance customs procedures from 2 days to 7 hours; and for the clearance of imports and exports from 18 and 14 days, respectively, to 1 day (UN-OHRLLC, 2017).

For landlocked countries, one-stop border posts (OSBPs), also known as joint border posts, are getting increasing attention in reducing the time and costs associated with multiple inspections and customs procedures at each border crossing. OSBPs are already an integral part of the regional integration agenda, supported mainly by the New Partnership for Africa's Development (NEPAD). Currently, more than 80 OSBPs have been planned or implemented in various parts of Africa (UNCTAD, 2021). Designing policies for quick and effective implementation of OSBPs may significantly contribute to the development of trade in landlocked countries.

Overall, AfCFTA undoubtedly offers a window of opportunity for African development and integration, and trade facilitation will be an important catalyser of this process. This requires a continental and multistakeholder approach due to the nature of cross-border trade so as to reduce trade costs associated with overlapping trade schemes and heterogeneous rules across RECs. Facilitating trade by harmonizing trade schemes is actually what AfCFTA secretariat is currently endeavouring for.

There is also a need for increasing awareness among all businesses and exporters on the existence of the free trade agreement and its potential impacts, informing policy makers on the potential benefits of the agreement and reform requirements for better utilization, and enhancing collaboration with global development partners to provide the required financial and technical assistance to improve human, physical, technological and institutional capacities.

From 2016, following the formulation of its 10-year strategy, ITFC realized that trade financing alone was not sufficient to meet the needs of its Member Countries. This realization gave birth to the emphasis on Trade Development in addition to Trade Financing efforts as a means to maximize the impact of ITFC interventions and to further support the development objectives of OIC countries. Since the adoption of this strategy, the trade development component of ITFC has been strengthened significantly with the adoption of the FIT model. The FIT model comprises Flagship Programs, Integrated Trade Solutions and Targeted Interventions designed to provide capacity building and technical assistance to OIC Member Countries including in trade facilitation. This can serve as a suitable modality to engage in trade facilitation initiatives that support OIC African countries' AfCFTA implementation strategies.

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Annex I: Supplementary Tables

Table A1: List of Trade Facilitation Indicators used in the Report

Dimension	Indicator	Scale	Source	Availability
Market Access	Tariffs	-	WITS	Annual
	NTM Coverage ratio (affected export/total export)	0-100		Latest between 2012-17
Trade Facilitation	OECD Trade Facilitation Index	0-2	OECD	2017, 2019
	A-Information availability			
	C-Advance rulings			
	D-Appeal procedures			
	E-Fees and charges			
	F-Documents			
	G-Automation			
	H-Procedures			
	I-Internal border agency co-operation			
	J-External border agency co-operation			
	K-Governance and impartiality			
Transport and Logistics	Logistics performance index	1-5	World Bank	2007, 2010, 2012, 2014, 2016, 2018
	Customs			
	Infrastructure			
	International shipments			
	Logistics quality and competence			
	Tracking and tracing			
	Timeliness			
Business Environment	WEF Enabling Trade Index	1-7	WEF Enabling Trade Index	2014, 2016
	Market Access			
	Efficiency and transparency of border administration			
	Availability and quality of transport infrastructure			
	Operating environment			

Table A2: Overall structure of the OECD Trade Facilitation Indicators

Indicator	Description
(a) Information availability	Enquiry points; publication of trade information, including on Internet
(b) Involvement of the Trade Community (Consultations)	Structures for consultations; established guidelines for consultations; publications of drafts; existence of notice-and comment frameworks
(c) Advance rulings	Prior statements by the administration to requesting traders concerning the classification, origin, valuation method, etc., applied to specific goods at the time of importation; the rules and process applied to such statements
(d) Appeal procedures	The possibility and modalities to appeal administrative decisions by border agencies
(e) Fees and charges	Disciplines on the fees and charges imposed on imports and exports; disciplines on penalties
(f) Formalities – documents	Acceptance of copies, simplification of trade documents; harmonisation in accordance with international standards
(g) Formalities – automation	Electronic exchange of data; use of automated risk management; automated border procedures; electronic payments
(h) Formalities – procedures	Streamlining of border controls; single submission points for all required documentation (single windows); post-clearance audits; authorised operators
(i) Internal co-operation	Control delegation to Customs authorities; co-operation between various border agencies of the country
(j) External co-operation	Co-operation with neighbouring and third countries
(k) Governance and impartiality	Customs structures and functions; accountability; ethics policy

Source: OECD (n.d.).

Table A3: SITC (Revision 3) 3-digit Commodity Codes and Descriptions for Figure 5

SITC 3-digit	Description	SITC 3-digit	Description
001	Live animals other than animals of division 03	422	Fixed vegetable fats and oils, crude, refined or fractionated, other than "soft"
042	Rice	542	Medicaments (including veterinary medicaments)
061	Sugars, molasses and honey	661	Lime, cement, and fabricated construction materials (except glass and clay materials)
071	Coffee and coffee substitutes	674	Flat-rolled products of iron or non-alloy steel, clad, plated or coated
122	Tobacco, manufactured (whether or not containing tobacco substitutes)	686	Zinc
222	Oil-seeds and oleaginous fruits of a kind used for the extraction of "soft" fixed vegetable oils (excluding flours and meals)	723	Civil engineering and contractors' plant and equipment; parts thereof
263	Cotton	792	Aircraft and associated equipment; spacecraft (including satellites) and spacecraft launch vehicles; parts thereof
333	Petroleum oils and oils obtained from bituminous minerals, crude	893	Articles, n.e.s., of plastics
334	Petroleum oils and oils obtained from bituminous minerals (other than crude); preparations, n.e.s., containing by weight 70% or more of petroleum oils or of oils obtained from bituminous minerals, these oils being the basic constituents of the preparation	971	Gold, non-monetary (excluding gold ores and concentrates)

Table A4: OECD Trade Facilitation Indicators (TFIs): 2017 vs. 2019

	Burkina Faso		Chad		Mali		Niger		Uganda		Africa		World	
	2017	2019	2017	2019	2017	2019	2017	2019	2017	2019	2017	2019	2017	2019
Average TF performance	**0.55**	**0.65**	**0.32**	**0.36**	**0.56**	**0.72**	**0.37**	**0.55**	**0.87**	**0.94**	**0.75**	**0.83**	**1.09**	**1.19**
A-Information availability	0.74	0.75	0.11	0.11	0.60	0.75	0.37	0.37	1.10	1.05	0.79	0.84	1.13	1.21
B-Involvement of the trade community	0.43	0.57	0.57	0.57	0.67	0.57	1.00	1.00	1.43	1.29	0.94	0.96	1.22	1.30
C-Advance rulings	0.29	0.29	0.00	0.00	0.29	0.89	0.00	0.80	0.57	0.80	0.54	0.61	1.04	1.19
D-Appeal procedures	0.29	0.33	0.10	0.13	0.67	0.67	0.13	1.00	0.89	0.78	0.79	0.93	1.14	1.26
E-Fees and charges	1.00	1.15	0.86	1.00	0.92	1.62	0.86	0.67	1.57	1.62	1.18	1.31	1.38	1.49
F-Documents	0.38	0.75	0.38	0.38	0.75	0.88	0.63	0.75	0.50	1.25	0.78	0.92	1.11	1.25
G-Automation	0.39	0.60	0.15	0.40	0.17	0.40	0.23	0.11	0.83	0.92	0.57	0.71	1.02	1.12
H-Procedures	1.03	1.16	0.50	0.46	0.67	0.79	0.50	0.73	1.00	1.00	0.91	1.00	1.11	1.27
I-Internal border agency co-operation	0.27	0.27	0.36	0.36	0.60	0.56	0.18	0.18	0.70	0.70	0.50	0.52	0.81	0.88
J-External border agency co-operation	0.46	0.46	0.50	0.50	0.27	0.27	0.18	0.18	0.82	0.82	0.56	0.57	0.85	0.88
K-Governance and impartiality	0.78	0.78	0.00	0.00	0.56	0.56	0.00	0.22	0.13	0.13	0.74	0.78	1.25	1.29

Source: OECD.

Table A5: Logistics Performance Index (LPI) Scores (2018)

	Overall LPI score	Customs	Infrastructure	International shipments	Logistics quality and competence	Tracking and tracing	Timeliness
Burkina Faso	2.62	2.41	2.43	2.92	2.46	2.40	3.04
Chad	2.42	2.15	2.37	2.37	2.62	2.37	2.62
Mali	2.59	2.15	2.30	2.70	2.45	3.08	2.83
Niger	2.07	1.77	2.00	2.00	2.10	2.22	2.33
Uganda	2.58	2.61	2.19	2.76	2.50	2.41	2.90
Africa	**2.46**	**2.27**	**2.24**	**2.51**	**2.39**	**2.51**	**2.80**
World	**2.87**	**2.67**	**2.72**	**2.83**	**2.82**	**2.90**	**3.24**

Source: World Bank.

Table A6: List of Countries Included in the Estimation

Non-African Countries (103)					African Countries (41)	
Afghanistan	Cuba	Iraq	New Zealand	Spain	Algeria	Malawi
Albania	Cyprus	Ireland	Nicaragua	Sri Lanka	Angola	Mali
Argentina	Czech Rep.	Israel	N. Macedonia	Sweden	Benin	Mauritania
Armenia	Denmark	Italy	Norway	Switzerland	Burkina Faso	Mauritius
Australia	Dominican Rep.	Jamaica	Oman	Taiwan	Burundi	Morocco
Austria	Ecuador	Japan	Pakistan	Tajikistan	Cameroon	Mozambique
Azerbaijan	El Salvador	Jordan	Panama	Thailand	Central Afr. Rep.	Niger
Bangladesh	Estonia	Kazakhstan	Paraguay	Trinidad and Tobago	Chad	Nigeria
Belarus	Finland	Kuwait	Peru	Türkiye	Congo, D.R.	Rwanda
Belgium	France	Kyrgyzstan	Philippines	Turkmenistan	Congo, Rep.	Senegal
Bolivia	Georgia	Laos	Poland	Ukraine	Cote d'Ivoire	Sierra Leone
Bosnia and Herzegovina	Germany	Latvia	Portugal	United Arab Emirates	Egypt	Somalia
Brazil	Greece	Lebanon	Qatar	United Kingdom	Ethiopia	South Africa
Bulgaria	Guatemala	Lithuania	Romania	USA	Gabon	Sudan
Cambodia	Haiti	Malaysia	Russia	Uruguay	Gambia	Tanzania
Canada	Honduras	Mexico	Saudi Arabia	Uzbekistan	Ghana	Togo
Chile	Hong Kong	Moldova	Serbia	Venezuela	Guinea	Tunisia
China	Hungary	Mongolia	Singapore	Vietnam	Kenya	Uganda
Colombia	India	Myanmar	Slovakia	Yemen	Liberia	Zambia
Costa Rica	Indonesia	Nepal	Slovenia		Libya	Zimbabwe
Croatia	Iran	Netherlands	South Korea		Madagascar	

Annex II:
Estimation Methodology and Data

The gravity model has been one of the most powerful and intuitive tool in studying and quantifying the impacts of various determinants of international trade. It allows users to assess the effects of alternative trade policies in a multi-country environment based on a structural model. Following Anderson and van Wincoop (2003), the structural gravity system is given by:

$$X_{ij} = \frac{Y_i Y_j}{Y_w}\left(\frac{t_{ij}}{P_i P_j}\right)^{1-\sigma}$$

Y_i, Y_j and Y_W denotes exporter, importer and world income levels, respectively, t_{ij} is bilateral trade cost, and P_i and P_j can be interpreted as consumer price indices in exporter and importer countries. Log-linearized version of the structural gravity equation with an additive error term ε_{ij} is given as follows:

$$\ln X_{ij} = lnY_i + lnY_j - lnY_w + (1-\sigma)lnt_{ij} - (1-\sigma)lnP_i - (1-\sigma)lnP_j + \varepsilon_{ij}$$

In a generalized gravity model, trade between country i and country j is positively related to the size of the economies and negatively related to the distance between them, or trade costs. There are three terms related to trade cost. $Intij$ is bilateral trade cost between partner countries and approximated by various geographic and trade policy variables, such as bilateral distance, common border and tariffs. The remaining terms of the trade cost are defined as inward and outward multilateral resistance terms (MRTs). This is the most preferred version of the gravity model used in assessing the various determinants of bilateral trade, including regional trade agreements (RTA), currency unions and foreign investment. In addition, a number of bilateral factors that foster or hamper trade are commonly included as explanatory variables to the model.

There are a number of challenges associated with the estimation of the above model. One is that the MRTs (lnp_i and lnp_j) are not observable, whose exclusion would result in biased estimates. There are a number of solutions offered in the literature. Two most commonly used solutions are (i) approximating with a remoteness index (Baier and Bergstrand, 2009) and (ii) using exporter and importer fixed effects, or pair fixed effects (Feenstra, 2016). While the first approach has been criticized for its little resemblance to its theoretical counterpart (Head and Mayer, 2014), the second approach prevents the estimation of impacts of trade policy variables as the dummy variables will absorb all observable and unobservable country-specific characteristics. Since the main focus of this research is to identify the impacts of various determinants of trade facilitation policies, which are country-specific, the first option is preferred in this study to account for MRTs. There are also recommendations in the literature to include intra-national trade to the model to estimate the impacts of non-discriminatory trade policies, but data limitations particularly on African countries prevent us to adopt this approach as well. Despite its limitations, the MRTs will be approximated with remoteness index[10].

Detailed theoretical discussions on deriving the structural gravity model are skipped (see Anderson and van Wincoop, 2003, Head and Mayer, 2014, and Yotov, 2022 for more detailed discussion). As standard in the literature, the following log-linearized version of the model is utilized in this study:

$$\begin{aligned}\ln X_{ij} = \beta_0 &+ \beta_1 lnDIST_{ij} + \beta_2 BORDER_{ij} + \beta_3 LANG_{ij} + \beta_4 COLONY_{ij} + \beta_5 CUR_{ij} + \beta_6 RTA_{ij} \\ &+ \beta_7 LLOCKED_{ij} + \beta_8 lnY_i + \beta_9 lnY_j + \beta_{10} lnRMT_i + \beta_{11} lnRMT_j + \beta_{12} lnTF_i \\ &+ \beta_{13} lnTF_j + (\gamma_i + \delta_j) + \varepsilon_{ij}\end{aligned}$$

10 Another way of dealing with this problem would be to transform the variables into a variable that varies bilaterally, so that they are unique to each country pair. This would allow us to include exporter and importer fixed effects while estimating the impacts of trade facilitation variables. We estimated a fixed effect model by including geometric average of these variables using PPML estimator, but the results became harder to interpret, as it was not possible to distinguish the impact of changes in policies by partners.

X_{ij} denotes bilateral exports, $DIST_{ij}$ denotes bilateral distance between most populated cities, and $BORDER_{ij}$, $LANG_{ij}$, $COLONY_{ij}$, CUR_{ij} and RTA_{ij} are dummy variables for common border, common language, common colony, common currency and RTA between partner countries. $LLOCKED_{ij}$ is a dummy variable if country i or country j is a landlocked country. Y_i and Y_j are exporter and importer income levels, RMT_i and RMT_j are approximated remoteness indexes, and TF_i and TF_j are main variables of interest related to trade facilitation. γ_i and δ_j are exporter and importer fixed effects that are included when using fixed effect estimation methods, in which case all country-specific variables are excluded.

In estimating the gravity equation, in addition to MRTs, there are also challenges associated with zero trade flows, heteroscedasticity of trade data and endogeneity of trade policy, among others (Yotov et al., 2016). In order to account for these challenges, the gravity model is estimated with the Poisson Pseudo Maximum Likelihood (PPML) estimator (Santos Silva and Tenreyno, 2006). In addition to PPML estimator, the results are also presented by using ordinary least square (OLS) estimator and the Heckman sample selection model. While OLS excludes the observations with zero trade flows, causing a possible sample selection bias, the Heckman model provides a natural way of including zero trade observations in the dataset (Helpman et al., 2008). This policy paper presents only the findings obtained from PPML estimator.

The main variables of interest (TF_i and TF_j) are estimated by using alternative definition and components of trade facilitation. Trade facilitation, defined as the simplification, modernization and harmonization of export and import processes, implies a fall in trade costs other than tariffs. These include both hard and soft infrastructure (Portugal-Perez and Wilson, 2012). The hard component related to the quality of ports, roads and logistics is approximated by the World Bank's Logistics Performance Index (LPI) and the soft component related to efficiency, transparency and governance is evaluated by using OECD's Trade Facilitation Indicators (TFI). The World Economic Forum (WEF)'s Enabling Trade Index (ETI) is also used to complement the analysis on trade facilitation and provide additional insight. From an econometric point of view, including right-hand side variables related to trade facilitation that measure similar aspects of a model can be conducive to multicollinearity. Accordingly, the model is estimated individually for each component of the variable of interest to assess its particular impact, as also suggested by Puertas et al. (2013), even though some components are clearly distinct from each other.

The data used in this study comes from a range of sources. The main data comes from the French Centre for Prospective Studies and International Information (CEPII). The CEPII gravity database includes all standard gravity variables for more than 200 countries between 1948 and 2019, such as distance, contiguity, language, landlocked and GDP (see Conte, M., P. Cotterlaz and T. Mayer, 2021, for more details). Trade data comes from BACI database of CEPII, which is based on the COMTRADE database and includes aggregate as well as manufacturing trade at bilateral level. Due to heavy concentration of mineral products in total trade of selected African countries, data on bilateral trade flows of manufactured goods is used as the main trade data. Overall, 144 countries are included to the estimation, 41 of which from the Africa region (Table A6). However, depending on the estimation year and variables used, the number of countries used in the estimation may be lower than the aggregate number.

Data on main variables of interest comes from several sources. Data on trade facilitation comes from the OECD's TFI database. Transport and logistics data comes from the World Bank's LPI. Data on trade barriers, including tariffs and non-tariff measures, are obtained from the World Integrated Trade Solution (WITS) of the World Bank. Data on business environment comes from WEF's ETI database. Table A1 in the Annex provides more detailed information on the trade facilitation indicators used in this study.

Annex III: Related Literature

Trade facilitation has emerged as an important issue for the world trading system over the last decade. In 2017, the Trade Facilitation Agreement (TFA) by the member states of the World Trade Organization (WTO) entered into force. There is a huge literature investigating the impact of the trade facilitation measures on trade flows. It is estimated that full implementation of the TFA could reduce trade costs by an average of 14.3% and boost global trade by up to US$ 1 trillion per year, with the largest gains in the poorest countries. For the African region, the reduction in trade costs would average 16.5%. Across coastal and landlocked Africa, reductions would average 16.8% and 15.7%, respectively (WTO, 2015; WTO, 2021).

In an early study, Wilson et al. (2005) found that improvement in trade facilitation of the 'below-average' countries halfway to global average yields an increase in global trade of $377 billion, representing an increase of about 10% in total trade, where the largest gain comes from the improvement in service sector infrastructure. Moïsé and Sorescu (2013) investigated the impacts of specific trade facilitation measures on developing countries' trade and found that the availability of trade-related information, the simplification and harmonization of documents, the streamlining of procedures and the use of automated processes have the greatest impact on trade volumes and trade costs. The combined effect of improvements reach up to around 15% reduction of total trade costs, where authors recommends a holistic approach in trade facilitation rather than simply focusing on isolated measures.

WEF (2013) shows that if every country improved border administration and transport and communications infrastructure and related services – even halfway to the world's best practices, global GDP could increase by US$ 2.6 trillion (4.7%) and exports by US$ 1.6 trillion (14.5%). For comparison, completely eliminating tariffs could increase global GDP by US$ 0.4 trillion (0.7%) and exports by US$ 1.1 trillion (10.1%). Even a more modest improvement in trade facilitation, in which all countries raised their performance halfway to regional best practice, would lead to increases of US$ 1.5 trillion (2.6%) in global GDP and US$ 1.0 trillion (9.4%) in global exports.

There are also significant negative impacts of the time required for border procedures and documentation on trade. In a recent study, Oberhofer et al. (2021) found that an additional day spent on those procedures corresponds to an ad valorem tariff equivalent of 0.4 percentage points. The trade facilitation efforts between 2006 and 2012 lead to an increase in welfare of middle/low-income countries of 1% and further reductions to 2012 levels of time for the average time for cross-border procedures between high-income countries could further increase welfare by 2.1%. In an earlier study, Persson (2013) showed that decreasing the number of days needed to export a good by 10%, increases exported goods between 3% (homogeneous goods) and 6% (differentiated goods).

UN (2020) shows that a reduction of 20% in trade costs could imply an increase on the size of new exporters and new surviving exporters by 14% and 19%, respectively. This would result in a growth in productivity due to expansion of more productive exporters. As a result of the ongoing COVID-19 pandemic and the collapse of global trade, promoting regional value chains proves to be even more relevant for building economic resilience.

Felipe and Kumar (2012) show that there have been significant gains in trade as a result of improving trade facilitation in the case of Central Asian countries, ranging from 28% in the case of Azerbaijan to 63% in the case of Tajikistan, estimated by artificially increasing the LPI of all the Central Asian countries up to halfway between each country's actual LPI and the average of all the countries in the sample. Authors find that the greatest increase in total trade comes from improvement in infrastructure, followed by logistics and efficiency of customs and other border agencies.

Trade costs are significantly large in Africa, making it even cheaper for African exporters to trade with developed economies rather than neighbouring countries. There is a great potential for the expansion of trade within Africa, but this is constrained by high trade costs and lack of productive capacities (Geda and Seid, 2015). Studies focusing on African continent have also found significant impacts of trade facilitation. Iwanow and Kirkpatrick (2008) assess the impact of trade facilitation and other trade-related institutional constraints on manufacturing export performance with particular reference to Africa. They found that a 10% rise in infrastructure availability, contract enforcement regulation or trade facilitation environment would increase African exports by around 17%. Constraining the sample to African economies yields a significant rise in the trade facilitation variable. Assessing the effects of trade facilitation measures and their combined effect on trade performance in a sample of 52 African countries, Sakyi and Afesorgbor (2019) found that trade facilitation improves trade performance in Africa; the better the level of trade facilitation, the larger the extent of trade flows. Porteous (2019) found that lower agricultural trade costs would have led to a large drop in grain prices, agricultural revenues, and expenditure on grains in sub-Saharan Africa, with an overall welfare gain equivalent to 2.2% of GDP.

Elimination of NTBs or improvements in trade facilitation policies would make significant gains for African trade. Various estimates by the World Bank, IMF, UNECA and others reveal that an improvement in trade facilitation would more than double intra-African trade under the AfCFTA. Portugal-Perez and Wilson (2009) shows that the gains for African exporters from cutting trade costs has a greater effect on trade flows than a substantial cut in tariff barriers. Trade facilitation policies, such as improved information availability, modernized procedures and harmonized customs requirements, can lead to substantial reduction in costs and time needed to export and import manufacturing goods in the continent. By speeding up the clearance of goods across borders, trade facilitation could also provide a big boost to trade in perishable agricultural goods (WTO, 2015). Increased predictability would allow the manufacturing firms to join global value chains (GVCs) and enjoy productivity improvements. Hoekman and Shepherd (2015) show that trade facilitation can significantly improve the participation of African firms to GVCs.

Challenges faced by landlocked countries (LLCs) require special attention. Lack of access to seaports increases the reliance on transit countries in realizing timely and efficient transportation of goods. Moreover, coordination problems among border agencies, the lack of reliable transport systems, high logistics costs, poor infrastructure, and dependency on the infrastructure of transit countries constitute some other challenges faced by LLCs (Pérez-Salas et al., 2014). Yet, transit countries are not always the major source of trade costs. Atkin and Donaldson (2015) have shown the low availability and quality of roads, inefficient logistics, low vehicle quality, and policies restricting competition have significant effects on trade costs, making intra-national trade 4-5 times costlier than in sub-Saharan African countries as compared to developed countries. Similarly, Freund and Rocha (2011) show that inland transit delays have greater impact on export than delays in other territories, where a one-day increase in inland transit time reduces exports by 7%, which signifies the importance of the quality of domestic infrastructure and institutions. Using structural gravity model, Moore (2018) estimates that there is a substantial "landlocked penalty", with LLCs on average exporting 27-41% less than non-landlocked countries over 2005-2014.

The high road transport costs reach up to 99% of trade value for countries within the Intergovernmental Authority on Development and 84% within the East African Community (UNCTAD, 2021). The particular constraints faced by landlocked economies in Africa are largely due to the immense gaps in road network density across African regions (AfDB, 2019). Inland transportation costs reach over 70% of the total import/export costs in landlocked African countries (UNECA, 2013). The funds needed for infrastructure investment is estimated at around $150 billion per year.[11] This emphasizes the importance of interim solutions to facilitate trade, which could be very powerful in promoting trade while infrastructure gaps are being closed in the longer term. A good example in cross-border facilitation is the Sikasso-Korhogo-Bobo Dioulasso special economic zone established between Mali, Cote d'Ivoire and Burkina Faso with the aim of encouraging agro-industrial and mining companies to set up in the area, the first cross-border special economic zone in West Africa (AUC & OECD, 2021).

11 See "https://www.fdiintelligence.com/article/76336"

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