ARTICLE

Implications of the African Continental Free Trade Area for intra-African trade

Jones Odei-Mensah[1] | Charles CKD Adjasi[2] | Michael Graham[3]

[1]Wits Business School, University of the Witwatersrand, 2 St David's Place, Parktown, Johannesburg, South Africa Email:jones.odei-mensah@wits.ac.za
[2]University of Stellenbosch Business School, University of Stellenbosch, Carl Cronjé Drive Bellville 7530, Cape Town, South Africa Email: chalresa@sun.ac.za
[3]University of Stellenbosch Business School, University of Stellenbosch, Carl Cronjé Drive Bellville 7530, Cape Town, South Africa Email: michael.graham@usb.ac.za

Abstract

Africa has traditionally recorded dismal levels of intra-African trade. The African Continental Free Trade Area (AfCFTA) and the action plan for Boosting Intra-Africa Trade (BIAT) is a strategy to change this pattern. The effect of this on sub regional as well as countries share of trade in total intra-African trade is however an empirical issue that deserves careful investigation. This paper estimates the impact of the AfCFTA on intra-African trade to assess regional and country distributional effects. The set up is a computable general equilibrium (CGE) model with a calibrated global trade analysis project (GTAP) data on Africa. Our results show that there are significant regional gains in intra-African trade, especially from a product point of view where the effects on regional exports are large. Specifically, we document changes in the intra-regional trade landscape of at least 30% in mostly the value-added non-traditional sectors such as textiles and apparel, light manufacturing, processed food and heavy manufacturing. Our work further establishes strong value chain and diversification effects across regions. There is growth in export and import volumes and generally terms of trade gains for participating countries. However, a few countries (four) suffer adverse terms of trade changes as well as direction of trade (intra-African trade) losses. We discuss a number of policy choices for maximising the benefits of the AfCFTA and mitigating the adverse effects.

KEYWORDS:
CGE; Economic integration; Economic development; Technical change; Africa

1 | INTRODUCTION

It is a well-known fact that Africa has a low level of intra-African trade. Apart from South Africa whose export share in intra African trade stood at 34% in 2016 (Table 1), all other African countries have very low (below 10%). Most African countries' share of exports in total intra-African trade is less than 5%. Historically, intra-African trade has been low, compared to African trade with the rest of the world. For example, for the period between 1995 and 2016, export trade among African countries averaged 12% compared to export trade among developing economies in America (20%), developing economies in Asia (47%), and the EU (69%) (see Table 2). The disappointingly low levels of intra-African trade has been one of the most cited challenges identified in regional integration and economic development discourses (see for instance Ndulo, 1992, Foroutan and Pritchett, 1993, Elbadawi, 1997, Lyakurwa et al., 1997 Geda and Kibret, 2008). Yet despite this gloomy picture, there is a high level of optimism for the potential to increase intra-African trade.

TABLE 1 Export value and share of country exports in total intra-African trade

2010			2016		
Rank	**Country**	**Percentage Share**	**Rank**	**Country**	**Percentage Share**
1	South Africa	32.7%	1	South Africa	34.4%
2	Nigeria	13.2%	2	Nigeria	7.2%
3	Egypt	4.8%	3	Côte d'Ivoire	5.4%
4	Côte d'Ivoire	4.6%	4	Egypt	5.1%
5	Ghana	3.5%	5	Ghana	3.7%
6	Kenya	3.1%	6	Kenya	3.5%
7	Tunisia	2.7%	7	Morocco	3.4%
8	Algeria	2.6%	8	Namibia	2.9%
9	Angola	2.4%	9	Tunisia	2.7%
10	Zambia	2.4%	10	Zimbabwe	2.6%
11	Zimbabwe	2.2%	11	Algeria	2.5%
12	Namibia	2.2%	12	Botswana	2.4%
13	Congo DRC	1.9%	13	Uganda	2.1%
14	Tanzania	1.7%	14	Zambia	2.0%
15	Morocco	1.7%	15	Tanzania	2.0%
16	Senegal	1.5%	16	Senegal	1.9%
17	Swaziland	1.5%	17	Angola	1.6%
18	Botswana	1.5%	18	Swaziland	1.5%
19	Mali	1.3%	19	Mozambique	1.3%
20	Congo	1.2%	20	Mali	1.1%
21	Benin	1.2%	21	Togo	1.1%
22	Uganda	1.1%	22	Ethiopia	1.1%
23	Mozambique	1.0%	23	Libya	1.0%
24	Libya	1.0%	24	Cameroon	0.9%
25	Cameroon	0.8%	25	Malawi	0.8%
26	Eq. Guinea	0.8%	26	Mauritius	0.7%

Source: Data for the table is from UNCTADstat, http://unctadstat.unctad.org

In recognition of the importance of intra-regional trade, the 18th Ordinary Session of the Assembly of Heads of State and Governments of the African Union, in January 2012, endorsed the framework for the establishment of the African Continental Free Trade Area (AfCFTA) and the action plan for Boosting Intra-Africa Trade (BIAT). An important implication of the AfCFTA is its projections for boosting intra-African trade and increase in Africa's trade and productivity. This is to be achieved be removal of tariff and non-tariff barriers that stand in the way of continental commerce. All things equal, the removal of these barriers should generate economies of scale in production and investment, which can in turn engineer a higher and vibrant intra-industry and regional trade. Essentially in the absence of these barriers, markets become more readily accessible thereby significantly increasing trade flows between African countries. This further spurs domestic production and increases the value chain integration of export products and total value of exports.

TABLE 2 Intra-regional trade (2016)

Trade Group	**Export (%) Intra-Group**	**Import (%) Intra-Group**
Arab Maghreb Union (AMU)	4.1	2.5
Association of Southeast Asian Nations (ASEAN)	24.2	22.7
Economic and Monetary Community of Central Africa (CEMAC)	3.1	4.2
Common Market for Eastern and Southern Africa (COMESA)	10.2	5.3
East African Community Economic Community of Central African States (ECCAS)	1.8	3.6
Economic Community of West African States (ECOWAS)	10.6	9.4
European Union (EU 28)	63.6	59.7
Southern Common Market (South America) (MERCOSUR)	13.1	15.8
Southern African Development Community (SADC)	20.6	21.5
West African Economic and Monetary Union (WAEMU)	14.4	8.2

Source: Adapted from UNCTADstat, http://unctadstat.unctad.org/

Prior studies have assessed the impact of the AfCFTA and various Free Trade Area (FTAs) and Customs Union effects on intra African trade. For instance, Mevel and Karingi (2013) concentrate on effect of total intra African trade and find an increase of 15% of an FTA. Jensen and Sander (2015) find non-tariff barriers (NTB) removal to be more effective for intra-African trade. De Melo and Tsikata (2015) and Balistreri et al. (2015) also emphasize the importance of removing NTBs to enhance intra-African trade. At a sub-regional level, Hallaert (2007) finds that a SADC FTA would improve the trade pattern of Madagascar. Similarly, Dimaranan and Mevel (2008) estimated that the potential impact of the COMESA would be an increase of trade in the COMESA region but with some substantial terms of trade losses. A study by Mold and Mukwaya (2016) also shows that a COMESA-SADC-EAC Tripartite Free Trade Area (TFTA) has substantial intra-regional trade benefits and increase intra-regional trade by 29%. Interestingly they show that the fear of concentration of gains to trade in high productivity and large economies is unwarranted.

What is missing in these studies is the evidence on the directional and distributional impact on intra-African trade from a regional sub group analysis across the entire continent and also from single country intra-African trade perspectives. These gaps raise a number of concerns for trade analysts, companies operating in the various value chains of African trade and policymakers alike, viz, how is intra-African trade between sub regions impacted by the AfCFTA? What is the effect on the value of exports to Africa for respective member countries to the AfCFTA? Are there losses from intra-regional trade for some countries and if so what is the direction of loss (or trade loss)? Answers to these questions are provided in this article through estimates of the impact of the AfCFTA on intra-African trade to assess regional and country distributional effects.

The removal of tariffs do not only enhance intra-African trade directly but also induces intra-industry trade effects with further intra-regional benefits. For instance, a typical African country (which exports primary products and depends on manufactured and processed imports) can use intermediate imports from the region to invest in the domestic production of different varieties of products (within the same product classification of its imports and exports) which serve a domestic and a regional market. Removing these barriers therefore offers the opportunity to increase regional value chains by changing the regional trade structure in the area of new and enhanced products and deepens the forward and backward linkages. The removal of these barriers can also be seen as a technological improvement, which enhances competitiveness, productivity and efficiency to augment free flow of trade between two countries or regions and intensify intra-industry trade and regional value chains.

However, there could be losers with the AfCFTA arrangement in the case of countries who are unable to access markets of member countries or experience some levels of reduced intra-African exports. These export losses could however be countered with growth of domestic production through the economies of scale from the lower cost of intermediate imports, consumer surplus from the consumption of quality low cost imported products and net welfare gains. Furthermore, the presence of such losses so long as there are net gains to intra-African trade will call for pre-emptive policies to help losing countries further mitigate the immediate adverse trade impacts. Therefore, an empirical evaluation of the potential intra-regional trade adjustment impact of tariff removal is essential as it can inform both the design of the intra-Africa trade strategies as well as the implementation of the policies that can alleviate any impact of adjustment.

The next section of paper gives an overview of the AfCFTA tariff proposals, with emphasis on the role of non-tariff barriers and their implications for continental trade. Section three discusses the analytical framework and empirical methods as well the data used for the analysis of the impact of the AfCFTA on intra-African trade. Section four presents the results from different scenarios and conclusions and recommendations are discussed in the final section.

1.1 | Overview of Tariff Proposals under AfCFTA

In June 2017 the African Union (AU) Ministers of Trade adopted modalities for Trade in Goods (tariff negotiations) and trade in services which set the tone for the negotiations that informs the tariff structure of the AfCFTA. The modalities for tariff negotiations include an ambitious 90% tariff liberalisation–the goal is for 90% of tariff lines to have a zero duty within 5 years (or 10 years for Least Developed Countries [LDCs]). Parties are required to develop schedules of tariff concessions in accordance with approved modalities of tariff liberalisation. The modalities are such that existing Regional Economic Communities (RECs) trade regimes will continue and new tariff liberalisation under the AfCFTA will only take place among those member states who were not party to an FTA.

The modalities also make provisions for member-states to negotiate on sensitive products on a request and offer basis. The goal is to reduce tariffs to zero within a 10-year period for non-LDCs and 13-year period for LDCs. The composition of sensitive products and their tariff reduction schedule may vary in each bilateral relationship. The modalities also provide for an exclusion list - a list of products for which tariff reductions are not to be proposed – which is also to be negotiated on a request and

offer basis. A critical part of the removal of trade barriers are the removal of Non-Tariff Barriers (NTBs). The AfCFTA defines NTBs as barriers that impede trade through mechanisms other than the imposition of tariffs (AU, 2018 p.3). NTBs form part of the popular obstacles to intra-African trade. NTBs are typically less transparent than tariffs and come in forms such as administrative procedures, complex rules of origin documentation, sanitary and phytosanitary measures (SPS), and technical barriers to trade (TBTs). These barriers greatly impede intra-African trade. For instance, it is estimated that the tariff equivalent of NTBs is 40 percent on average (Carrere and De Melo, 2009a, b). Hence, the importance of addressing such barriers cannot be overemphasized and the AfCFTA has taken the right step by including a NTB mechanism.

2 | ANALYTICAL FRAMEWORK

The concept of intra-regional trade can be linked to the concept of regional integration under Viner's (1950) famous customs union theory. Jacob Viner espouses the possibility of trade creation; the situation where trade from regional integration creates benefits from complementing domestic production and generating extra needed imports and trade diversion effects; when as a result of regional integration agreements imports are sourced from non-competitive and expensive regional integration members (or diverted away from cheaper sources to more expensive sources). The net benefits of this, in net trade effect and welfare terms, have been a source of controversy although Viner makes a case which points to the need for deep theoretical interrogation and empirical analysis. Subsequently, a host of analytical works have occurred and in recent times the new trade theory (Krugman 1980, Krugman and Venables 1990, Krugman 1991a and 1991b, Grossman and Helpman 1991) new economic geography have shown the possibility of enhanced trade creation effects. Importantly these recent additions show the net trade benefits of regional integration, even when countries have homogenous characteristics. A critical element in these extensions to trade theories is that of the importance of removing trade costs (in the form of sunk costs, transportation cost, tariffs and other barriers) and the effects it generates. Two effects are worth mentioning. First is the enhanced competition effect, and second the exports and imports spillover effects (Coe and Helpman 1995, Coe Helpman and Hoffmeister 1997). These developments point to the need to reinvestigate the issue of trade creation effects of regional integration efforts.

To ascertain the impact of the agreement on Africa, we employ a Computable General Equilibrium (CGE) analysis. CGE simulation models, a standard tool in empirical analysis, combine general equilibrium structures with economic data. These models are widely used to analyse aggregate welfare and distributional impacts of policies. A CGE analysis has the advantage of tracking the medium to long-term adjustment of firms, households, governments and production and consumption patterns to policy changes. The method, therefore, aptly depicts the impact of a policy or shift in prices.

GTAP CGE model is used for the simulation analysis. It is a well-known model for multiregional, multisector and indeed a global general equilibrium model, which incorporates all economic factors[1]. The GTAP CGE is a comparative static model that allows us to gauge the different possible states of a set of economies and particularly useful in ascertaining the future effect of policy changes. The model contains standard behavioural equations, which describe the behaviour of economic agents, as well as identity equations. Intersectoral linkages and relationships are captured via input-output tables, whilst linkages between countries are captured via bilateral trade flows. Bilateral trade flows are based on the Armington assumption where products are differentiated by country of source. The analysis in this paper uses GTAP database version 9, which contains 140 regions, 57 sectors and 8 factors. The 140 regions were aggregated to 32 regions (including 22 African countries and two regional aggregates of other African countries) and the 57 sectors are aggregated into 22 sectors as shown in Tables 3 and 4.

[1]The GTAP Model uses the GEMPACK software

TABLE 3 Country and sector aggregation

Countries/Regions Aggregates (32)	**Sectors (22)**
Egypt	Grains and Crops
Morocco	Livestock and Meat Products
Tunisia	Forestry and fisheries
Benin	Mining and Extraction
Burkina Faso	Beverages and tobacco products
Cameroon	Dairy products
Cote d'Ivoire	Vegetable oils and fats
Ghana	Other food and sugar
Guinea	Textiles and Clothing
Nigeria	Wood and paper products
Senegal	Motor vehicles and parts
Togo	Leather and Light Manufacturing
Ethiopia	Petroleum, coal products
Kenya	Chemical, rubber, plastic prods
Madagascar	Mineral products nec
Malawi	Metals
Mauritius	Electronics and other manufacturing
Mozambique	Utilities and Construction
Rwanda	Communication
Tanzania	Transport
Uganda	Financial and insurance services
Zambia	Other Services
Zimbabwe	
Botswana	
Namibia	
South Africa	
Rest of World	
Rest of South African Customs	
Rest of Africa	
East and South Asia	
North America	
European Union 28	

Source: GTAP Aggregation by Authors

TABLE 4 Aggregation of Commodities

Model Sectors	Acronym	GTAP Sectors
Grains and Crops	GrainsCrops	Paddy rice; Wheat; Cereal grains nec; Vegetables, fruit, nuts; Oil seeds; Sugar cane, sugar beet; Plant-based fibers; Crops nec; Processed rice.
Livestock and Meat Products	MeatLstk	Cattle, sheep, goats, horses; Animal products nec; Raw milk; Wool, silk-worm cocoons; Meat: cattle, sheep, goats, horse; Meat products nec
Forestry and fisheries	fish_forestr	Forestry; Fishing
Mining and Extraction	Extraction	Coal; Oil; Gas; Minerals nec
Beverages and tobacco products	b_t	Beverages and tobacco products
Dairy products	mil	Dairy products
Vegetable oils and fats	vol	Vegetable oils and fats
Other food and sugar	procfood_o	Sugar; Food products nec;
Textiles and Clothing	TextWapp	Textiles and Wearing apparel
Wood and paper products	lumpp	Wood products; Paper products, publishing
Motor vehicles and parts	vehicles_eq	Motor vehicles and parts; Transport equipment nec;
Leather and Light Manuf	Leath_oMnfc	Leather products Manufactures nec
Petroleum, coal products	p_c	Petroleum, coal products;
Chemical, rubber, plastic prods	crp	Chemical, rubber, plastic prods
Mineral products nec	nmm	Mineral products nec;
Metals	metals	Ferrous metals; Metals nec; Metal products
Electronics and other manuf	electronic_o	Electronic equipment; Machinery and equipment nec.
Utilities and Construction	Util_Cons	Electricity; Gas manufacture, distribution; Water; Construction.
Communication	cmn	Communication.
Transport	Transpor	Trade; Transport nec; Sea transport; Air transport;
Financial and insurance servic	fin_ins	Financial services nec; Insurance;
Other Services	OthServices	Business services nec; Recreation and other services; PubAdmin/Defence/Health/Educat; Dwellings.

2.1 | Policy scenarios

The AfCFTA aims at removal of tariffs and barriers to increase intra-African trade and deepen African integration. It also emphasizes the consequential improvement in technology and productivity spill-overs within African countries from trade creation. The AfCFTA ultimately aims to positively impact the economic performance of African countries in ways that enhance economic welfare. Four sets of experiments (termed Policy Scenarios) are conducted in this paper:

i. Policy Scenario 1 is the fundamental AfCFTA policy and involves the elimination of tariffs on all trade amongst African countries. Specifically in this scenario we address the question of what happens to intra-regional trade if the more aggressive approach of clamping down on trade barriers is implemented to the hilt.

ii. Policy Scenario 2 entails the removal of tariffs on only agricultural products. The idea behind scenario 2 is to gauge the sensitivity of agriculture in African trade. The issue of sensitivity is germane in trade but to incorporate specific sensitive sectors also requires reliable information on the list of sensitive sectors per country. Only a handful of AfCFTA countries have supplied their list of sensitive sectors. Although some studies (Vanzetti et al., 2017) have used this in analysing the impact of the AfCFTA, modelling with such limited information creates an unfair disadvantage to the larger group of countries who have not provided information on the list of sensitive sectors. Further, the focus on agriculture is premised on the fact that trade in agricultural goods are sensitive for all African countries.

iii. Policy Scenario 3 involves elimination of tariffs on all trade plus additional reduction in Non-Tariff Barriers (NTBs).

iv. Policy Scenario 4 is a variant of 3 where a smaller level of NTBs reduction is applied. Table 5 below presents the structure of the experiments and simulations under the GTAP model framework.

TABLE 5 Experiments and policy scenarios

Policy Scenario	Description	Variable shock GTAP Model
1	Eliminate tariffs on all trade	$\Delta tms = -100\%(T, CfTA, CfTA)$
2	Eliminate tariffs on all agricultural trade	$\Delta tms = -100\%(Ag, CfTA, CfTA)$
3	Eliminate tariffs on all trade plus reduction in NTBs	$\Delta tms = -100\%(T, CfTA, CfTA)$ $\Delta ams = 10\%(T, CfTA, CfTA)$
4	Eliminate tariffs on all trade plus smaller reduction in NTBs	$\Delta tms = -100\%(T, CfTA, CfTA)$ $\Delta ams = 5\%(T, CfTA, CfTA)$

The issue of Non-Tariff Barriers (NTBS) are dealt with in this paper via popular approaches in the extant literature. NTBs are defined by UNCTAD (2015) as *policy measures, other than ordinary customs tariffs, that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both* and include among others standards, custom procedures, technical barriers, licenses, prohibitions, distribution restrictions, procurement restrictions, competition measures and rules of origin. They can, and often present significant barriers to trade. To account for the removal of NTBs in CGE modelling an identification of NTBs per sector per country and application of suitable tariff reductions was done. Two other approaches are the iceberg effect and willingness to pay methods (popularized by Hummels et al., 2007; Hummels and Schaur, 2013; Walmsley and Minor, 2016).

This analysis uses the iceberg cost approach. The iceberg cost reduction reflects the idea that there is a cost (fraction of transported good) associated with transporting goods which can be (similar to melting of an iceberg) reduced to enhance trade. It is also referred to as the famous sand in the wheels problems in trade. The sand in the wheels are the various NTBs that delay, and in some cases, stall movement of trade. The idea of iceberg costs is common in African countries and resonates well with barriers to trade across African borders. Since the pioneering work of Hertel et al. (2001) who applied the iceberg cost approach in CGE modelling in assessing the impact of customs delays in trade between Japan and Singapore, there has been a host of studies which utilized the technique (for instance Fox et al., 2003; Fugazza and Maur, 2008). The removal of the cost entails a positive technological shock to augment the free flow of trade and in particular lower the cost of imports. This has further advantages of inducing import benefits for firms, households, investments and government and also generates productivity benefits for domestic production and exports. In GTAP notation the iceberg cost is applied via the technological preference AMS parameter in the Armington (1969) import equation:

$$MV_{i,j}^{F} = \frac{P_{i,j}^{F}}{AMS_{i,j}^{F}} \cdot M_{i,j}^{F} \cdot AMS_{i,j}^{F} \tag{1}$$

where $MV_{i,j}^{F}$ is the value of foreign good i from country j, $P_{i,j}^{F}$ is the price of the foreign good i from country j, $M_{i,j}^{F}$ is the quantity of imports from country j (same as exports of j) and $AMS_{i,j}^{F}$ is the Armington augmenting iceberg cost on imports of country j. Following Hertel et al. (2001) a reduction in iceberg cost (positive shock to AMS) has two contrasting effects within the Armington structure. First it reduces the prices for the importer and causes a substitution of demand for the imported good, and subsequently increase its quantity demand, and, second, it reduces the amount that needs to be imported to satisfy a given level of demand. Although these effects work in the opposite direction, the first effect entails higher price elasticity effects and often dominates the second. The computed quantity which the importer observes changes in direct proportion to the size of the NTB and helps maintain the initial accounting balance. The four policy scenarios reported in Table 2 are applied for the simulation exercise using the GTAP Model under standard GTAP closure (Hertel et al., 2007).

3 | DISCUSSION OF RESULTS

3.1 | Sub regional trade impacts

The CGE simulation results presented in Table 6 confirms that there are substantial benefits in the form of intra-African trade benefits that accrue to African trade as a result of the AfCFTA. All regions experience considerable positive increases in intra-African exports and most countries experience an increase in exports to other African countries. The increase in intra-regional

trade is higher for regions like the Southern African Customs Union (SACU), which already have advanced institutional arrangement towards a more integrated free trade area. The existence of a long and well-established harmonized tariff within SACU implies that the region has less tariff complexities and is bound to be able to take advantage of policies which grant further access into the rest of Africa.

Intra-African export flow from the Southern African Customs Union (SACU) amounts to US$18.4 billion (inclusive of intra SACU trade), with about 46% (US$8.4 billion) of it into the Southern African region, 19% (US$ 3.5 billion) into East Africa, 14.8% (US$2.7 billion) into West Africa and 11.8%(US$2.1 billion) into Central Africa. Gains in intra SACU trade itself amounts to US$ 876 million. West Africa has the second highest gain in intra-African exports of (US$ 12.99 billion) of which 65% (US$ 8.46 billion) is made up of intra West African trade, 16% (US$ 2.1 billion) is exports into the SACU region, and 8% (US$ 1.06 billion) is exports into the Central African region. North Africa comes third in the quantum of increases in intra-African trade with US$ 10.4 billion volume of exports into the continent, of which 43% (US$ 4.49 billion) is intra North African trade and 25.7% (US$ 2.69 billion) are increased exports into West Africa. Total export increase from Southern African to the rest of Africa amounts to US$ 7.06 billion with 45% (US$ 3.19 billion) being exports into SACU region, approximately 19.9% (US$ 1.4 billion) each flow into Southern and Central Africa. East Africa records an export increase of US$ 3.8 billion into Africa, of which 45% (US$ 1.7 billion) are intra East African trade and 32.5% (US$ 1.25 billion) are exports into the Central African region. Finally, Central Africa has US$ 2.2 billion extra export flows into Africa with 57% (US$ 1.27 billion) of this flowing to Southern Africa and 25% (US$ 567 million) into West Africa.

TABLE 6 Intra-regional exports (US$ millions)

Direction of Trade From/To	North Africa	West Africa	Southern Africa	East Africa	SACU	Central Africa	Total
North Africa	4493	2690	299	1238	1214	511	10445
West Africa	678	8461	551	106	2126	1069	12991
Southern Africa	437	193	1410	430	3194	1400	7064
East Africa	334	138	221	1745	162	1252	3852
SACU	675	2730	8422	3552	876	2185	18440
Central Africa	199	567	1271	102	48.3	39.1	2226

Source: GTAP Model estimates

These intra-regional export figures show immense growth of intra-African trade, increased regional market access; a result of reduced costs and barriers of trade and price differentials. These figures are also indicative of the improved competition, possible diversification in products and exports and indeed increased intra-industry trade. This implies that such benefits will substantially change the landscape of intra-African trade. To the extent that the AfCFTA aims to promote intra-African trade in differentiated products, the similarity of African countries' exports can be expected to increase. There is the potential effect of expanding supply chain networks associated with exports and imports across the continent. It is also an indication of improved value chain creation and integration and further confirms the backward and forward linkage effects of continental trade.

Our simulation results also confirm that from a product point of view there are significant changes in the regional exports and thus a clear indication of substantial changes in the intra-regional trade landscape. From Table 7, there is significant growth in exports from all product sectors for most regions (except SACU). The highest gains (an average of 73%) are made in the textile and apparel sector mostly in West Africa, SACU, and Central Africa and to an extent East Africa. This is followed by gains in the light manufacturing (52% average), processed food (36.9%), heavy manufacturing (34.7%) and meat and livestock sectors (30.7%) respectively. Remarkably the growth is largest (at least 30%) in mostly the value-added non-traditional sectors like textiles and apparel, light manufacturing sectors, processed food and heavy manufacturing and an indication of a value chain and diversification effects across regions.

TABLE 7 Value of regional exports (% change)

Sector	North Africa	West Africa	Southern Africa	East Africa	SACU	Central Africa	Average
Grains & Crops	11.91	11.45	17.25	14.12	12.96	16.04	14.0
Meat & Livestock	22.2	34.49	18.7	17.46	33.76	57.39	30.7
Extraction	7.98	9.54	10.23	10.07	6.91	12.12	9.5
Processed Food	28.79	33.46	33.04	27.17	64.11	34.92	36.9
Textiles & Apparel	7.38	199.4	24.69	41.48	88.73	78.54	73.4
Light Manufacturing	30.73	59.5	68.47	65.08	30.32	60.46	52.4
Heavy Manufacturing	20.6	58.0	28.09	50.29	15.81	35.19	34.7
Utility & Construction	10.1	4.18	33.22	7.96	10.35	12.89	13.1
Transport & Communication	7.54	5.76	7.58	8.05	-0.85	9.99	6.3
Other Services	6.95	4.34	4.41	6.95	-2.18	8.46	4.8
Average	**15.4**	**42.0**	**24.6**	**24.9**	**26.0**	**32.6**	

Source: GTAP Model estimates

The lead regions in the respective largest gain sectors are West Africa in the textiles and apparel (199% increase in exports) and heavy manufacturing sectors (58% increase), Southern Africa in the light manufacturing (68.47% increase) sector, SACU in the processed food sector (64%), and Central Africa in the meat and livestock sector (57.39%). It is notable thus whilst there are increases in the exports of traditional sectors like primary sectors in agriculture (grains and crops) and mining (extraction) there are increases (and substantial ones) in the production and export of value added-non-traditional sectors across all regions. The intra-industry and value chain creation effect of the AfCFTA is quite substantial and these trends show a significant shift in the production and trade landscape across Africa.

From Figures 1 to 4 we also observe that there is a higher positive effect in the continent-wide volume of exports in most sectors under scenario 3, with electronic and other manufacturing sectors having the largest export volume gain. Five sectors: extraction, metals, transport, fisheries and forestry and communication, however, suffer export losses. Finally, under Scenario 3, we observe a deepening in intra-African trade from the direction of trade. Most countries experience an increase in exports to other African countries.

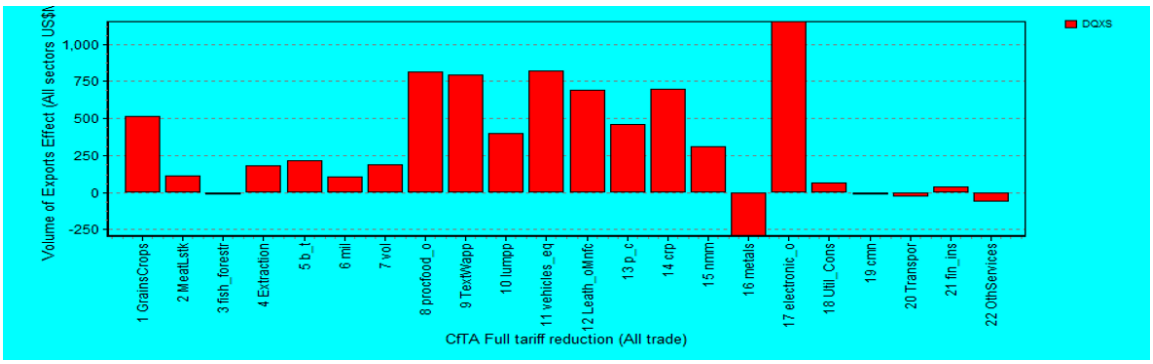

FIGURE 1 Volume of exports effect (US$ million) Scenario 1

3.2 | Distributional impact across countries

Although the general trend from the analysis so far appears to be largely that of trade creation, it is important to examine the distributional effects across countries within the respective sub regions. Tables 8 and 9 present simulation results for changes in export and import volumes and terms of trade across the respective African countries under the different scenarios. Most countries experience growth in merchandise export and import volumes in all four scenarios. Some interesting patterns are worth noting.

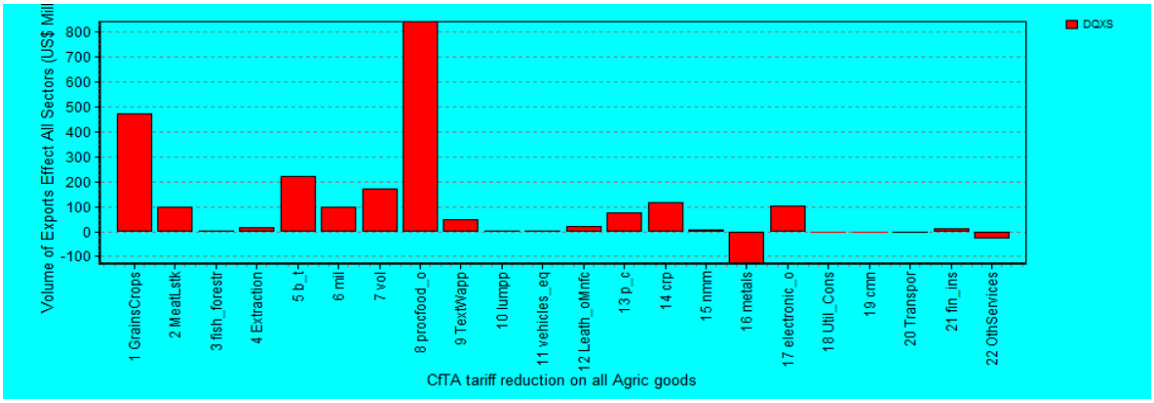

FIGURE 2 Volume of exports effect (US$ million) Scenario 2

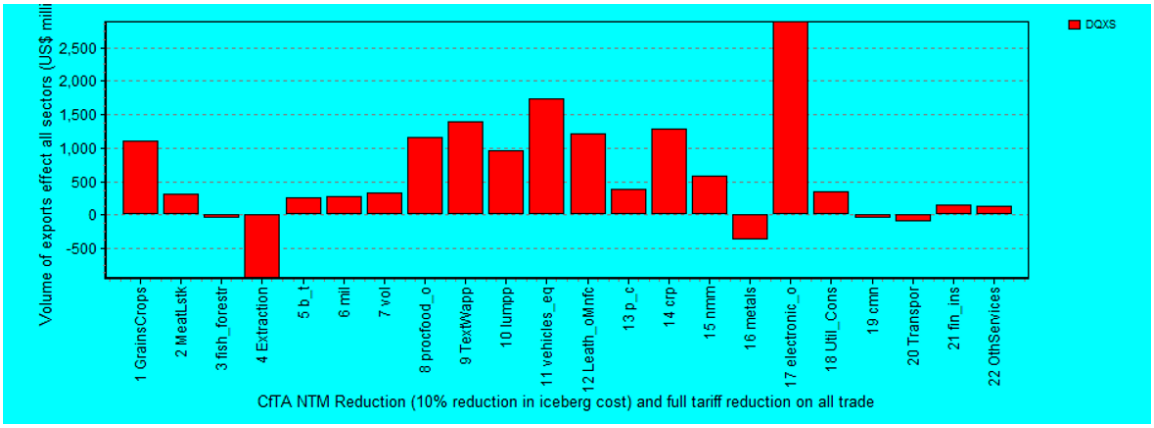

FIGURE 3 Volume of exports effect (US$ million) Scenario 3

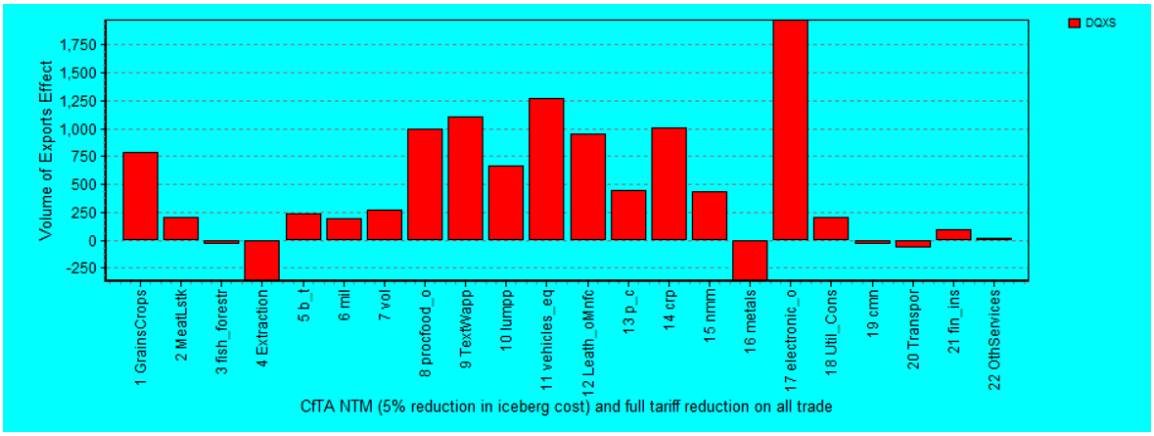

FIGURE 4 Volume of exports effect (US$ million) Scenario 4

TABLE 8 Distribution of merchandised export and import volume changes (%)

	Policy Scenario 1		Policy Scenario 2		Policy Scenario 3		Policy Scenario 4	
	Export	Import	Export	Import	Export	Import	Export	Import
Egypt	0.26	0.44	0.1	0.13	1.04	2.44	0.63	1.36
Morocco	0.05	1.17	0	0.3	0.14	3.08	0.09	2.05
Tunisia	0.2	0.91	0.12	0.19	0.21	3.51	0.2	2.1
Benin	**-5.9**	6.22	**-7.16**	4.52	29.03	**-5.16**	3.6	3.48
Burkina Faso	1.45	2.81	0.34	0.39	1.92	5.11	1.67	3.92
Cameroon	4.79	4.51	0.81	0.74	9.16	9.78	6.92	7.06
Cote d' Ivoire	3.56	7.36	0.8	2.23	9	16.79	6.16	11.89
Ghana	3.71	4.91	0.97	0.94	6.68	9.79	5.1	7.2
Guinea	5.88	1.92	2.43	0.83	8.24	4.6	7.03	3.2
Nigeria	0.52	0.95	0.09	0.2	1.04	2.02	0.76	1.46
Senegal	3.06	6.74	0.66	1.97	4.86	13	3.92	9.78
Togo	1.03	9.87	0.08	0.81	**-0.18**	21.8	0.31	15.72
Ethiopia	2.11	0.9	0.38	0.12	1.14	2.8	1.71	1.81
Kenya	3.57	2.12	2.92	0.97	2.99	6.8	3.33	4.36
Madagascar	0.13	0.11	0.07	0.03	1.08	2.15	0.57	1.05
Malawi	3.24	5.18	1.02	2.95	**-1.25**	9.24	1.01	7.19
Mauritius	0.16	0.51	0.05	0.22	1.33	3.72	0.69	1.99
Mozambique	0.65	0.48	0.42	0.37	1.35	3.19	0.96	1.83
Rwanda	3.05	4.85	0.67	1.06	5.66	8.51	4.44	6.65
Tanzania	4.42	3.24	3.31	1.51	4.74	5.85	4.69	4.5
Uganda	2.71	4.17	1.51	1.82	4.82	8.74	3.76	6.4
Zambia	**-1.81**	**-0.91**	**-0.49**	**-0.25**	**-3.49**	0.19	**-2.64**	**-0.32**
Zimbabwe	39.7	6.19	12.51	0.25	42.4	14	41.18	10.04
Botswana	1.24	1.93	0.03	0.04	2.5	3.92	1.85	2.9
Namibia	0.17	1.97	-0.08	0.51	1.86	7.59	0.97	4.67
South Africa	1.56	2.85	0.15	0.42	3.9	7.07	2.67	4.85
Rest of SACU	1.6	4.5	0.1	0.41	3.75	9.76	2.64	7.03
Rest of Africa	1.1	1.82	0.24	0.33	2.53	4.23	1.77	2.95
Average Africa	2.94	3.13	0.79	0.86	5.23	6.59	3.79	4.90
Rest of the World	-0.01	-0.02	0	-0.01	-0.01	-0.2	-0.01	-0.04

Source: GTAP Model and author estimates

First, the average merchandise export and import volume changes are high in Policy Scenarios 3 and 4 with the highest volume changes under Policy Scenario 3 (Table 7). Second, from Table 8 fewer countries (four) suffer adverse terms of trade changes under Policy Scenario 3. More countries (11 plus the aggregated countries for the rest of Africa) suffer adverse terms of trade effects in Scenario 1, nine countries are adversely affected by terms of trade changes under Scenario 2 and five other countries in Scenario 4. This reaffirms the importance of removing iceberg distortions in African trade. The removal of these distortions not only induce the flow of much needed imports at lower cost but also brings significant technological benefits to domestic production and make exports more competitive. Third, Zambia suffers consistent drop in export volumes across all scenarios. A similar trend is observed for import volumes but in a different order of direction under Scenario 3. Although import volumes improve under Scenario 3, the drop in export volumes is undesirable. Fourth and finally, Benin under Scenario 3 is the only country that incurs losses in import volumes.

TABLE 9 Distribution of terms of trade changes (%) across countries

Country/Region	Policy Scenario 1	Policy Scenario 2	Policy Scenario 3	Policy Scenario 4
Egypt	0.148	0.036	0.969	0.529
Morocco	0.614	0.151	1.38	0.974
Tunisia	0.321	0.032	1.37	0.812
Benin	1.79	1.49	-3.62	0.193
Burkina Faso	-0.296	0.039	0.09	-0.108
Cameroon	-0.335	0.066	-0.159	-0.255
Cote d' Ivoire	1.77	0.978	2.87	2.33
Ghana	1.3	0.277	2.55	1.89
Guinea	-0.558	-0.068	-0.22	-0.393
Nigeria	0.048	-0.003	0.339	0.19
Senegal	3.13	1.08	5.6	4.36
Togo	2.73	0.47	6.08	4.4
Ethiopia	-0.254	-0.021	1.45	0.541
Kenya	-0.089	-0.531	2.76	1.29
Madagascar	-0.016	-0.014	0.228	0.095
Malawi	0.335	0.736	3.19	1.71
Mauritius	0.17	0.121	1.18	0.64
Mozambique	-0.086	0.052	1.85	0.914
Rwanda	1.26	0.384	1.83	1.53
Tanzania	-0.002	-0.442	1.25	0.59
Uganda	0.906	0.34	2.35	1.61
Zambia	1.27	0.232	3	2.12
Zimbabwe	-7.06	-2.43	-5.76	-6.44
Botswana	0.228	-0.001	0.2	0.219
Namibia	1.39	0.589	2.85	2.1
South Africa	0.889	0.187	1.86	1.36
Rest of SACU	1.42	0.193	2.23	1.81
Rest of Africa	-0.049	-0.022	0.024	-0.012
Average Africa	0.39	0.14	1.35	0.89
Rest of the World	0.006	-0.002	-0.085	0

Source: GTAP Model and author estimates

A further decomposition of the results from a country perspective in table 10 shows that all countries experience an increase in total intra-African exports, a confirmation of the total intra-African trade gains from the AfCFTA. Nonetheless, despite the substantial total gains in intra-African trade, not all countries experience positive export flows to all regional members. Some countries (see Table 11) which experiences a reduction in exports to other member countries-an indication of some form of trade diversion.

TABLE 10 Total Intra-African exports (US$ million)

Country	*Total exports to Africa*
Egypt	3268
Morocco	2505
Tunisia	1726
Benin	115
Burkina Faso	142
Cameroon	399
Cote d'Ivoire	2189
Ghana	2161
Guinea	162
Nigeria	4653
Senegal	940
Togo	400
Ethiopia	273
Kenya	1077
Madagascar	92
Malawi	253
Mauritius	325
Mozambique	494
Rwanda	217
Tanzania	621
Uganda	580
Zambia	1383
Zimbabwe	663
Botswana	371
Namibia	829
South Africa	14936
Rest of SACU	426
Rest of Africa	8281

Source: GTAP Model estimates

TABLE 11 Countries with losses in intra-African exports

Direction of trade from	**To**						
Egypt	Zimbabwe						
Botswana	Malawi						
Mauritius	Zimbabwe						
Namibia	Mozambique						
Burkina Faso	Cameroon						
Madagascar	Zimbabwe						
Ethiopia	Zimbabwe						
Kenya	Malawi	Zimbabwe					
Zambia	Malawi	Zimbabwe					
Uganda	Cameroon	Zimbabwe					
Rwanda	Cameroon	Zimbabwe					
Senegal	Egypt	Zimbabwe	Kenya				
Malawi	Kenya	Zimbabwe	Botswana				
Togo	Egypt	Kenya	Madagascar	Malawi	Mauritius	Zimbabwe	Botswana

Source: GTAP Model estimates

4 | CONCLUDING REMARKS AND REFLECTIONS ON TRADE POLICY

This paper showed that there are potential implications of the AfCFTA for intra-African trade. The AfCFTA creates intra-Africa market access opportunities for respective countries and regions. This results in significant increases in trade flows between African countries. The tariff removal and cost reductions in the free trade arrangement also reduces production costs, induces economies of scale which spur higher domestic production and investment into different sectors of the economy. This process enhances growth in exports across sectors, also boosts value addition to production and exports, and further deepens intra-industry trade in Africa. Our simulation of the AfCFTA scenario confirms that these intra-African trade gains are substantial and occur across the regions, with the largest gains in West African exports into other African regions. There are however, some country losses in the quantum of intra-African exports and this require attention to design measures to assist these respective countries. There is also a substantial change in the production landscape especially of export products. This change is largely in the value-added non-traditional sectors like textiles and apparel, light manufacturing sectors, processed food and heavy manufacturing and an indication of a value chain and diversification effect across regions.

These outcomes from the scenarios examined hold important policy lessons realising the gains for intra-African trade and value chain effects of the AfCFTA for all.

First, significant work to create awareness on the AfCFTA is needed to prepare respective countries for the direct trade impact. Second policies and shock absorbers will need to be crafted to help cushion losing countries. Such absorbers could be based on a gradual removal of some non-tariff barriers (e.g. technical and distribution barriers) for potential net losers to reduce the export and terms of trade losses and allow them to catch up. It is also important to foster the rapid planning and investment in public regional infrastructure and institutions (e.g. regional investment and technological centres, regional finance institutions with a focus on financing intra-regional business ideas, regional trade facilitation and standards bureaus among others). These institutions can help potential losers to easily tap into, or create backward and forward linkages as a way to quickly benefit from the spillovers which occur from the AfCFTA. In this case although some countries are net export losers they are able to take advantage of the imports to invest in downstream as well as upstream related sectors.

REFERENCES

1. Armington, P. S. (1969). A Theory of Demand for Products Distinguished by Place of Production. IMF Staff Papers 16, 159-76.
2. African Union (AU). (2018). Agreement establishing the African continental free trade area. African Union. Retrieved from: https://au.int/sites/default/files/treaties/34248-treaty-consolidated_text_on_cfta_-_en.pdf
3. Balistreri, E.J., Tarr,D .G. and Yonezawa, H. (2015), "Deep integration in eastern and southern Africa: What are the stakes?," Journal of African Economics, 24(5), pp.677-706.
4. Carrere, C. and De Melo, J. (2009a). Notes on detecting the effects of Non Tariff Measures. CERDI working document E 2009.32.
5. Carrere, C. and De Melo. J. (2009b). Non Tariff Measures: What do we know? What should be done?. CERDI working document E 2009.33.
6. Coe, D.T., and E. Helpman. 1995. "International R&D Spillovers." European Economic Review 39(5): 859–87.
7. Coe, D. T., E. Helpman and A.W. Hoffmeister. 1997. "North-South R&D Spillovers." Economic Journal 107: 134–49.
8. De Melo, J. and Tsikata, Y. (2015), "Regional integration in Africa: Challenges and Prospects," CEPR Discussion Paper no: 10598.
9. Dimaranan, B., Mevel, S., 2008. The COMESA customs union: a quantitative assessment. Unpublished manuscript. International Food Policy Research Institute, Washington, DC.
10. Fox A., Francois J. F. and Londono-Kent P. (2003). Measuring border costs and their impact on trade flows: The United States-Mexican trucking case. Unpublished manuscript.
11. Fugazza, M. and Maur, J.C. (2008). Non-tariff barriers in CGE Models: How useful for policy? Journal of Policy Modeling 30(3), 475-490.
12. Grossman, G. and Helpman, E. (1991), Innovation and Growth in the World Economy, MIT
13. Jensen, H.G. and Sandrey, R. (2015), Continental Free Trade Area - A GTAP assessment, Tralac, South Africa.
14. Krugman P.R., (1991a) Increasing returns and economic geography Journal of Political Economy 99 483-499.
15. Krugman P.R., (1991b) Geography and Trade, MIT Press, Cambridge MA.
16. Krugman, P.R., (1980) Scale economies, product differentiation and the pattern of trade American Economic Review 70 950-959.
17. Hallaert, J.J., 2007. Can regional integration accelerate development in Africa? CGE model simulations of the impact of the SADC FTA on the republic of Madagascar. IMF Working Papers, pp. 1–30.
18. Hertel, T. and Tsigas M. (1997). Structure of GTAP. In T. W. Hertel. Global Trade Analysis Modeling and Applications., Cambridge University Press
19. Hertel, T., Walmsley T. and Itakura K. (2001). Dynamic effect of the "New Age" free trade agreement between Japan and Singapore. Journal of Economic Integration, 16(4), 446-84.
20. Hummels, D., Minor P., Reismann M., and Endean E. (2007). Calculating tariff equivalents for time in trade." N. A. Inc. Arlington, VA, Report for the United States Agency for International Development (USAID).
21. Hummels, D. and Schaur G. (2013). Time as a trade barrier. American Economic Review 103, 1-27.
22. Mashayekhi, M., Peters, R., Vanzetti, D., 2012. Regional integration and employment effects in SADC. Policy Priorities for International Trade and Jobs. 387.

23. Mevel, S., Karingi, S., 2012. Deepening regional integration in Africa: a computable general equilibrium assessment of the establishment of a continental free trade area followed by a continental customs union. 7th African Economic Conference, Kigali, Rwanda Vol. 30 (October).

24. Minor, P., Mureverwi, B., 2013. A Household Level Analysis of African Trade Liberalization: The Case of Mozambique Vulnerability of low Income Households. World Bank, BNPP Program

25. Mold A., and Mukwaya R., (2016) Modelling the economic impact of the tripartite free trade area: Its implications for the economic geography of Southern, Eastern and Northern Africa Journal of African Trade 3 57–84

26. Saygili M., Peters R., and Knebel C. (2017). African Continental Free Trade Area: Challenges and opportunities of tariff reductions. UNCTAD Research Paper No. 15 UNCTAD/SER.RP/2017/15

27. Tanyi, Kenneth T. (2015), "Assessing Africa's two billion populated market by 2063: The facts and fallacies of a Continental Free Trade Area (CFTA)," Business and Economics Journal, 6(154).

28. Vanzetti, D., Peters, R.,and Knebel C. (2017). Non-tariff measures: Lifting CFTA and ACP trade to the next level. UNCTAD Research Paper No. 14 UNCTAD/SER.RP/2017/14

29. Viner, J., (1950), The Customs Union Issue, New York.

30. Walmsley T. and Minor P. (2016). Willingness to pay in CGE models: Estimating the benefits of improved customs efficiencies within the WTO Trade Facilitation Agreement Impact. Econ Working Paper -002Rev-02

31. Willenbockel, D., 2013. General equilibrium assessment of the COMESA-EAC-SADC TFTA FTA. Online at http://mpra.ub. uni-muenchen.de/51501/. MPRA Paper No. 51501.

How to cite this article: Odei-Mensah, J., Adjasi, C.C.K.D. & Graham, M. . , *Journal of African Political Economy and Development*, *volume 10, 2025*.