Potential economic and environmental impacts of the African Continental Free Trade Area (AfCFTA)*

Oluwasola Emmanuel Omoju
Department of Economic Development and Social Studies
National Institute for Legislative and Democratic Studies (NILDS)
National Assembly,
Abuja, Nigeria
shollcy@yahoo.co.uk

DRAFT: NOT FOR PUBLICATION

June 2021

DRAFT: NOT FOR PUBLICATION

Abstract

The launch of the African Continental Free Trade Agreement (AfCFTA) is motivated by the need to reverse the lower share of intra-African trade and proportion of African trade with the rest of the world. While the economic impacts of the AfCFTA have attracted significant attention in the literature, empirical evidence on its environmental effects is scanty. Hence, this study attempts to investigate the economic and environmental impacts of the AfCFTA using the PEP-1-w multi-region world CGE model calibrated against the GTAP 7 database. The preliminary results are based only on the economic impacts. Overall, the results shows that the implementation of the AfCFTA will lead to welfare improvement in Africa, but these welfare improvements do not cut across all countries proportionally. Also, the agreement results in trade diversion as trading within African countries increase at the expense of trading with the rest of the world. Based on these results and forthcoming results on the environmental aspects, appropriate policy recommendations will be suggested.

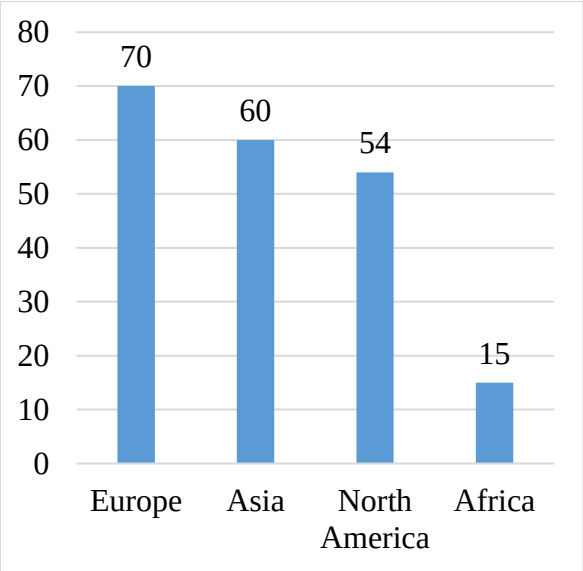
1.0 Introduction

The African Continental Free Trade Agreement (AfCFTA) is aimed at boosting intra-African trade and promoting regional development. Regional trade on the continent is low compared to other regions of the world. According to the United Nations Economic Commission for Africa (UNECA, (2018), average intra-African trade is 15%, compared to 70% for Europe, 60% for Asia, and 54% for North America (Figure 1). Also, Africa's share of global trade at 2.1% is lower than the continent's share of global GDP at 2.9% (Figure 2). The need to boost intra-African trade and

* This version of the report only look at the economic impacts of the AfCFTA. Further work is ongoing on the modeling to incorporate the environmental module.

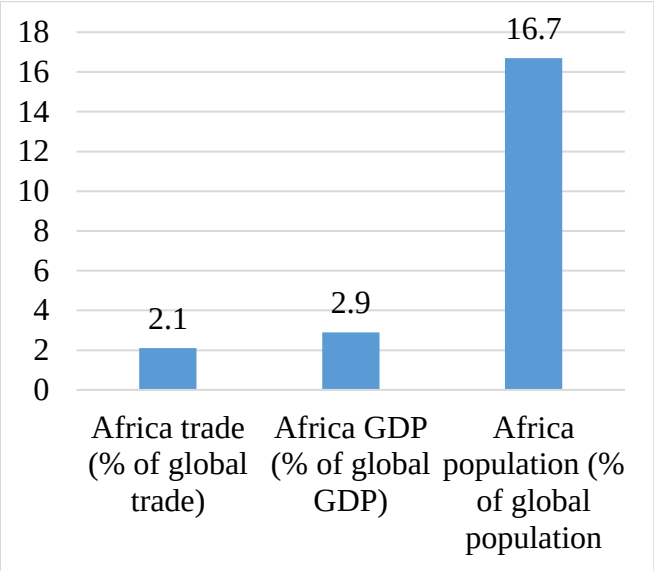
regional integration as a basis for achieving structural transformation, poverty reduction and long-term sustainable development is the motivation for the AfCFTA.

Figure 1: Average intra-regional trade (%)



Source: UNECA (2018)

Figure 2: African trade, GDP and population (%)



World Bank (2020)

A major thrust of the AfCFTA is the removal of tariffs from about 90% of goods, enhancing free flow of goods and services across the continent. The agreement is the largest free trade area in the world in terms of the number of participating countries, and estimates from the UNECA showed that the agreement will boost intra-African trade by 52% by 2022 compared to the 2010 levels. Hence, the agreement is in response to the very low intra-African trade compared to other regional blocs), and the need to boost intra-continental trade as a means for enhancing social economic development in the continent.

The AfCFTA has a strong link to the Sustainable Development Goals (SDGs). Specifically, it corresponds to Goal 17 of the SDGs, which advocates for strengthening global partnership for sustainable development. It seeks to encourage regional cooperation and development among nations. Also, the AfCFTA is in support of Goal 9, which is about building resilient infrastructure, promoting inclusive and sustainable industrialisation and fostering innovation. These are also in line with the African Union Agenda 2063.

However, despite the potential impacts of the agreement in boosting intra-African trade and regional development, several issues such as SMEs protection, human rights, labour practices and

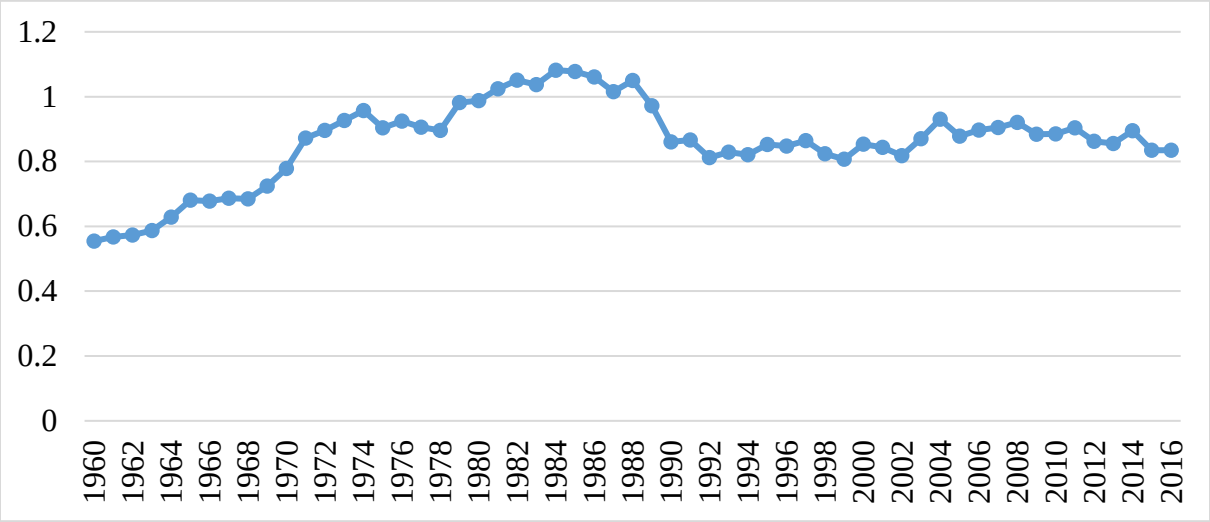
DRAFT: NOT FOR PU

workers' rights, gender considerations and inclusivity, and environmental impacts (Chutto, 2019; UNECA and Friedrich Ebert Stiftung, 2017), among others, have been raised with respect to the AfCFTA in particular and trade liberalisation in general. Goal 13 of the SDGs advocates for urgent actions to tackle climate change and its impacts. The expected change in resource allocation and production and trading pattern may influence the continent's ability to meet its climate change targets. As noted by the IMF (2019), Africa's exports to the rest of the world are basically unprocessed primary commodities and solid minerals (average of 75% during 2007-2017), while intra-African exports are largely manufacturing commodities (40%). This suggests that promoting intra-African trade may enhance trading in manufacturing commodities, which is capable of engendering regional industrialization and structural transformation, with its attendant environmental implications.

Environmental issues, particularly the impacts of climate change, has become more pronounced in the continent. According to the Boko, et al. (2007), Africa is one of the most vulnerable regions to the impacts of climate change. Currently, the continent contributes less than 5% of global CO_2 emissions, but the level of emissions have trended upward in recent years (see figure 3). Efforts to promote economic growth and development, through trade and industrialization, may increase CO_2 emissions in the continent, particularly if there are no commensurate efforts to change the energy mix towards renewables. Gertler (2012) had posited that most of the growth in energy demand and the associated emissions, over the next 25-30 years, will come from developing countries. Therefore, in consideration of the potential impacts of the AfCFTA on industrialization and structural transformation in Africa, it is essential to balance the economic and environmental aspects of the AFCFTA.

DRAFT: NOT FOR PUBLICATION

Figure 3: Trend of CO_2 emissions in sub-Saharan Africa (metric ton per capita), 1960-2016



Source: World Development Indicators (World Bank)

This is the main focus of this study. This study attempts to investigate the potential economic and environmental impacts of the AfCFTA using a computable general equilibrium (CGE) model. There are existing studies on the impacts of the AfCFTA in the literature. However, most of these studies only focused on economic impacts (Table 1). A review of these studies showed that the AfCFTA will boost intra-African trade, GDP and economic welfare among participating countries, with variations across countries.

Table 1: Economic impacts of the AfCFTA: Summary of the key findings from the literature (%)

	Scenario	GDP	GDP, African trade	Total exports	Total imports
Removal of tariffs on intra-AfCFTA trade					
ADB (2019)	Removal of all tariffs on intra-AfCFTA trade	0.10 (US$2.8 billion)	14.60 (US$10.1 billion)	1.00 (US$5.8 billion)	0.90 (US$5.8 billion)
Mevel and Karingi (2012)	Removal of all tariffs on intra-AfCFTA trade by 2017 + CET	0.20	52.30	4.00	
Jensen and Sandrey (2015)	Removal of all tariffs on intra-AfCFTA trade	0.70	4.30	3.11	
Saygili, Peters, and Knebel (2018)	Removal of all tariffs on intra-AfCFTA trade	0.97	32.80	2.50	1.80
Abrego et al. (2019)	Removal of all import tariffs	0.037–0.053[a]			
World Bank	Gradual removal of 97% of tariffs on intra-AfCFTA trade	0.13 (US$12 billion)	21.76 (US$131 billion)	1.78 (US$35 billion)	2.31 (US$41 billion)
Removal of tariffs and NTBs on intra-AfCFTA trade					

DRAFT: NOT FOR PUBLIC

ABD (2019)	Removal of all tariffs on intra-AfCFTA trade, removal of NTBs	1.25 (US$37 billion)	107.20 (US$74.3 billion)	44.30 (US$107.2 billion)	33.80 (US$214.1 billion)
Jensen and Sandrey (2015)	Removal of all tariffs on intra-AfCFTA trade; 50% reduction in NTBs	1.60	7.26	6.28	
Abrego et al. (2019)	Removal of all tariffs; 35% reduction in NTBs	7.60–1.89–2.11[a]	8.40		
World Bank	Gradual removal of 97% of tariffs on intra-AfCFTA trade	2.24	51.85	18.84	19.58
Removal of tariffs and NTBs on intra-AfCFTA trade and implementation of TFA					
ADB (2019)	Removal of all tariffs on intra-AfCFTA trade; removal of NTBs; implementation of TFA	3.50 (US$100 billion)	132.70 (US$92 billion)	51.10 (US$295.6 billion)	46.20 (US$292.8 billion)
World Bank	Gradual removal of 97% of tariffs on intra-AfCFTA trade; 50% reduction in NTBs; implementation of TFA	4.20 (US$413 billion)	92.07 (US$556 billion)	28.64 (US$560 billion)	40.61 (US$714 billion)

World Bank (2020)

Note: AfCFTA = African Continental Free Trade Area; CET = common external tariff; GDP = gross domestic product; NTB = non-tariff barrier; TFA = trade facilitation agreement.

a = equivalent variation

While there have been growing body of literature on the economic impacts of the AfCFTA, there is no known study on the environmental impacts of the agreement. However, review of the literature on the environmental impacts of trade liberalisation found mixed effects (Kirkpatrick and Serban Scrieciu, 2007) and varying methodological approaches (OECD, 2000). This study advances the AfCFTA literature by focusing on both the economic and environmental impacts, as opposed only the economic effects. It is also different from the existing literature on the environmental impacts of trade liberalization. Most of the existing studies focused either on specific sectors or studied the linear effects of trade on the environment (Tariku, 2015; Cherniwchan, 2017; Kolcava, Nguyen and Bernauer, 2019) using econometric analysis. The failure to capture intersectoral effects has inspired the use of CGE modeling in studying the environmental effects of trade liberalization (Strutt and Anderson, 2000; Li, 2005). However, the current CGE literature are largely single country analysis. Given the global impacts of climate and environmental issues, a world CGE model may be more appropriate to evaluate the environmental impacts of trade liberalization in general, and the AfCFTA in particular. This is the gap this study

DRAFT: NOT FOR PUBLICATION

seeks to fill. This study, therefore, investigates the potential economic and environmental impacts of the AfCFTA using a multi-region world CGE model.

2.0 Methodology and Data

This study uses a static multi-region world CGE model to analyse the economic and environmental impacts of the AfCFTA. CGE models are used to investigate the impacts of public policy. It has been widely used to explore the impacts of trade liberalization in general (de Melo, 1988; Piermartini and The, 2005), and the AfCFTA in particular. For this study, the PEP-w-1 model, developed by Lemelin, et al. (2013), is used. The PEP-w-1 model is a multi-region, single period world model version of the PEP-1-1 model (developed by Decaluwe, et al. 2013). The equations in the model follow the neo-classical economic theory, and assumes that consumers and producers are rational, and seek to maximise utility given a budget constraints and minimise production costs respectively.

The PEP model separates capital and labour into several categories, and takes into account a broader set of tax instruments. In the model, output is composed of intermediate consumption and value added in fixed proportion. Value added is a composite of the production factors (which include land, labour and capital) via a CES function. Commodities produced in each sector of the economy are either sold in the domestic market or exported to the rest of the world, and this relationship is depicted by a constant elasticity of transformation (CET) function. The relative prices of domestic sales and exports provide signal for producers in this respect. Similarly, commodities consumed in the domestic market comprises of both imported and domestically produced commodities, which are assumed to be imperfect substitutes (Sisso, Sawadogo and Natama, 2016). This is indicated using the Armington assumption with a CES function between imported and domestic commodities (Armington, 1969).

The CGE model is calibrated to the GTAP 7 database. The GTAP 7 database provides an overview of the global economy in 2004, including bilateral trade flows, transportation and protection linkages and flows between domestic industries. The main database include 134 countries/regions, 57 sectors and 5 factors. Including all AfCFTA member countries, whose data is available in the GTPA database, separately as individual countries in the model would make the model not to solve due to the small figures for some countries. Hence, I only included a few African countries, and aggregate the remaining African countries as “Rest of Africa (ROA)”. The African countries are

DRAFT: NOT FOR PUBLICATION

selected across the five sub-regions in the continent. Assuming the AfCFTA may have a different effect on small and large economies, I select the largest and smallest economy in all the five sub-regions, whose data are included in the GTAP database. Nigeria and Togo are selected in Western Africa, South Africa and Malawi in Southern Africa, Egypt and Tunisia in Northern Africa, Kenya and Ethiopia in Eastern Africa, and an aggregation of countries represents Central Africa. The remaining African countries in the GTAP database are aggregated as the "ROA". All non-African countries are aggregated as the "Rest of the World (ROW). At the end of the aggregation of the countries/regions, we have 11 countries/regions. Also, the original 57 sectors in the GTAP database are aggregated into only 15 sectors while the 5 production factors in the database was retained (see the Appendix for list of countries/regions, sector and factors. The aggregation was done using the methodology provided by Robichaud (2015).

Based on the data available in the GTAP 7 database, a synopsis of initial intra-Africa trade tariffs and taxes are provided in Table 2 and 3. Table 2 shows the average import duties that exist between African countries while Table 3 shows the average export tax rates. With varying import duties and export taxes before the implementation of the AfCFTA, the agreement will lead to trade diversion among African countries. Most countries that currently enjoy free trade with others will have that advantage eroded, and may have to compete with other AfCFTA member states.

Table 2: Bilateral average import duty rates (%)

REGIONS	ROW	ROA	Nigeria	Togo	Egypt	Tunisia	South Africa	Malawi	Kenya	Ethiopia	Central Africa
ROW	0.022	0.086	0.083	0.151	0.080	0.093	0.059	0.069	0.075	0.103	0.083
ROA	0.010	0.066	0.107	0.066	0.020	0.038	0.001	0.030	0.066	0.084	0.137
Nigeria	0.016	0.025		0.187	0.089	0.259	0.000	0.018	0.069	0.034	0.177
Togo	0.021	0.047	0.117		0.154	0.000	0.008				0.197
Egypt	0.026	0.044	0.071	0.109			0.083			0.108	0.079
Tunisia	0.018	0.041	0.044	0.170			0.063	0.164	0.035	0.229	0.210
South Africa	0.024	0.051	0.082	0.135	0.160	0.187		0.097	0.100	0.137	0.142
Malawi	0.067	0.007	0.040			0.205	0.001			0.033	0.014
Kenya	0.040	0.033	0.097	0.106		0.168	0.095			0.154	0.216
Ethiopia	0.022	0.140	0.026	0.167	0.025	0.182	0.061	0.204	0.068		0.031
Central Africa	0.003	0.053	0.035	0.107	0.015	0.149	0.007	0.072	0.091	0.080	0.011

DRAFT: NOT FOR PUBLICATION

Source: Extracted from GTAP 7 database

Also, the share of bilateral trade as a percentage of total trade is presented in Table 3. From the table, African countries trade more with the rest of the world than with fellow African nations. On average, about 78% of African trade is with the rest of the world. The only countries with less than 50% trade with the rest of the world is Zimbabwe, which is partly as a result of global sanctions. Within African countries, the level of intra-African trade varies. For example, Mozambique, Zimbabwe, Namibia and Zambia trade more with South Africa than any other African countries, and there economies are significantly tied to that of South Africa. Hence, by opening up free trade in the continent, other countries may compete with these countries for the South African market, reducing their comparative advantage.

Table 3: Bilateral average export tax rates (%)

REGIONS	ROW	ROA	Nigeria	Togo	Egypt	Tunisia	South Africa	Malawi	Kenya	Ethiopia	Central Africa
ROW	0.011	0.009	0.007	0.021	0.007	0.003	0.010	0.012	0.021	0.026	0.002
ROA	0.001	0.016	0.018	0.015	0.005	0.000	0.010	0.059	0.036	0.005	0.044
Nigeria	0.000	0.001		0.002	0.003	0.000	0.000	0.000	0.006	0.009	0.001
Togo	0.017	0.045	0.076		0.001	0.000	0.000	0.001	0.001	0.001	0.072
Egypt	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000
Tunisia	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000
South Africa	0.011	0.031	0.070	0.043	0.019	0.013		0.059	0.020	0.027	0.058
Malawi	0.019	0.024	0.022	0.003	0.001	0.003	0.009		0.004	0.036	0.044
Kenya	0.019	0.050	0.053	0.036	0.001	0.012	0.038	0.054		0.053	0.059
Ethiopia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Central Africa	0.059	0.047	0.025	0.009	0.019	0.022	0.046	0.005	0.016	0.022	0.029

Source: Extracted from GTAP 7 database

It is important to note that this study only focused on the (total) removal of tariff from all commodities (goods and services) within the AfCFTA, and does not consider non-tariff measures in goods and services and trade facilitation measures.

DRAFT: NOT FOR PUBLICATION

3.0 Results

I simulate the potential economic and environmental impacts of the AfCFTA. This section presents the summary of the impacts of the AfCFTA on key economic variables. Table 4 presents the results of the impacts of the AfCFTA on sectoral output in the selected countries. It is expected that the implementation of the AfCFTA will induce a re-allocation of resources such that the output of some sectors will increase in some countries and decrease in others, in line with comparative advantage. For example, the output of agriculture sector will decline in Tunisia and Malawi by 0.038%, and 0.052%, but will increase in Nigeria, Togo, Egypt, South Africa, Kenya, Ethiopia, Central Africa, and the ROA by 0.031%, 0.188%, 0.007%, 0.048%, 0.182%, 0.248%, 0.508, and 0.075% respectively. Also, only Nigeria (0.000%), Togo (9.413%), Egypt (0.005%), Kenya (3.510%), and Central Africa (0.143%) will experience an increase in the output of the energy, minerals, and metal sectors. The other countries in the study witness a decline in the output of this sector. These results suggest that the AfCFTA will cause changes in sectoral production across the continent, following expected re-allocation of resources occasioned by the agreement. Tariff-free trade may encourage countries to import commodities from other AfCFTA member states at relatively cheaper price, rather than producing the commodity themselves. Hence, the resources will be re-allocated to the sectors the country has comparative advantage in.

Table 4: Impacts on sectoral output

	ROW	ROA	Nigeria	Togo	Egypt	Tunisia	South Africa	Malawi	Kenya	Ethiopia	Central Africa
Agriculture	0.005	0.075	0.031	0.188	0.007	-0.038	0.048	-0.052	0.182	0.248	0.508
Energy, minerals and metal products	0.003	-0.019	0.000	9.413	0.005	-0.001	-0.819	-0.067	3.510	-1.273	0.143
Processed foods, beverages and tobacco	-0.001	0.386	0.033	-4.775	0.054	0.465	0.649	0.365	-0.067	0.346	-0.264
Textile and leather products	0.005	0.532	-1.885	49.868	0.017	-0.045	-0.098	-2.551	2.105	-0.096	-3.421
Wood and paper products	-0.001	-0.184	-0.479	0.609	0.059	0.296	0.133	-0.122	0.173	0.378	1.470
Petrochemical, coal, rubber and plastic products	-0.010	0.605	0.320	0.704	0.023	-0.038	1.514	1.304	5.056	-0.646	-2.021

DRAFT - NOT FOR PUBLICATION

Motor vehicles and parts, equipment and other manufacturing	-0.007	-0.049	-0.092	6.526	0.269	0.279	0.507	5.415	1.070	-1.350	-0.454
Utilities	0.000	0.165	0.200	0.451	0.033	0.026	-0.078	0.415	1.085	-0.030	0.550
Construction	-0.003	-0.690	-0.058	-23.157	-0.082	-0.287	-.0386	-0.658	-2.896	-1.236	-1.492
Trade	0.000	0.045	-0.090	1.476	0.008	0.093	0.229	-3.164	0.307	-0.366	-0.270
Transportation	0.008	0.166	0.556	0.429	-0.065	-0.214	-0.283	3.607	-979	-0.145	0.883
Communication	0.001	-0.013	0.074	-2.443	-0.001	-0053	0.017	0.521	-0.438	-0.092	0.025
Financial services and insurance	0.001	-0.008	0.096	-3.126	-0.010	-0.023	-0.068	0.126	0.069	-0.192	0.446
Other services	0.000	-0.082	-0.029	-2.041	-0.081	-0.046	0.025	0.879	-0.454	0.000	0.205
Public administration, defense, health and education	0.000	-0.001	0.142	-0.807	0.001	-0.015	-0.017	-0.022	0.127	-0.007	0.347

Source: Author's computation

The goal of the AfCFTA is to increase intra-African trade. Table 5 presents the results of the impacts of the AfCFTA on bilateral trade, focusing mostly on trade within Africa and with the rest of the world. From the results, trade flows between African countries and the rest of the world mostly reduce. Only Malawi (0.617%) and Central Africa (0.545%) will experience an increase in their exports to the ROW while Togo (2.771%), Egypt (0.068%) and South Africa (1.275%) will experience an increase in their imports from the ROW. Trade flows from the ROW to AfCFTA members will decline by 1.036% (RoA), 1.121% (Nigeria), 0.052 (Tunisia), 8.294% (Malawi), 0.563 (Kenya), 1.440% (Ethiopia) and 3.947% (Central Africa). Similarly, trade flows from AfCFTA members to the ROW will decline by 0.188% (ROA), 0.027% (Nigeria), 8.057% (Togo), 0.313% (Egypt), 0.418% (Tunisia), 0.2405% (South Africa), 1.475% (Kenya), and 1.146% (Ethiopia).

The bilateral trade flows among African countries is mixed. In some cases, the trade flows increase. For example, trade flow from Nigeria to all AfCFTA members will increase. Also, trade flows from AfCFTA members (except Ethiopia) to Nigeria will increase. Hence, these results imply that while the AfCFTA is poised to improve aggregate intra-African trade, bilateral trade flows among the AfCFTA members may increase or decrease, depending on the current level of trade between the countries, current tariff regime, changes in production level caused by the agreement, and other factors. Besides, the increase in intra-African trade will be at the detriment of trading with the rest of the world, resulting in trade diversion.

DRAFT: NOT FOR PUBLICATION

Table 5: Impacts of AfCFTA on bilateral trade (%)

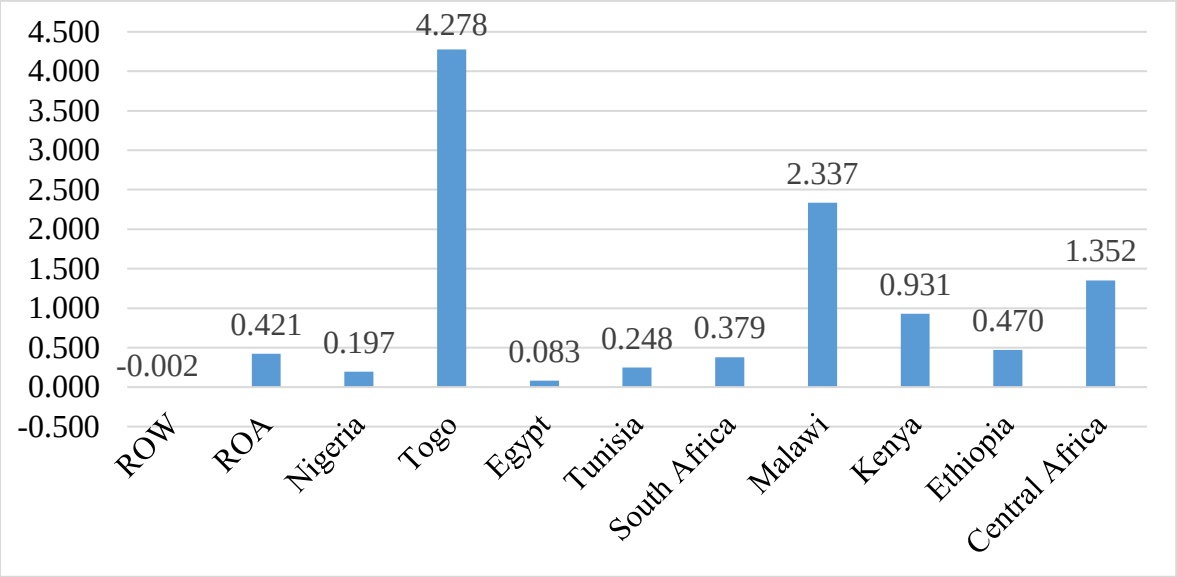
	RoW	RoA	Nigeria	Togo	Egypt	Tunisia	South Africa	Malawi	Kenya	Ethiopia	Central Africa
RoW	0.005	-1.036	-1.121	2.771	0.068	-0.052	1.275	-8.294	-0.563	-1.440	-3.947
RoA	-0.188	16.069	20.941	23.344	4.819	8.144	3.342	9.640	20.167	14.921	28.872
Nigeria	-0.027	4.304		49.113	7.777	41.835	0.883	1.334	12.251	1.243	30.403
Togo	-8.057	15.551	51.680		13.858	-11.825	-3.943	-7.408	-7.311	-4.265	48.154
Egypt	-0.313	7.581	10.144	18.199		-0.515	13.768	-10.624	-3.490	21.669	8.830
Tunisia	-0.418	7.000	3.625	34.144	-0.407		9.825	23.596	3.882	54.097	35.782
South Africa	-2.405	12.961	27.696	39.451	37.830	43.506		17.161	25.126	32.617	32.725
Malawi	0.617	6.087	11.621	7.661	-0.281	47.296	3.939		-0.942	14.952	6.640
Kenya	-1.475	13.186	18.033	27.209	-1.459	24.936	23.754	-1.576		40.395	50.575
Ethiopia	-1.146	27.340	-0.001	21.014	3.321	23.824	6.828	29.734	12.824		0.033
Central Africa	0.545	23.319	11.414	29.027	7.376	42.456	13.329	13.284	25.489	20.019	0.991

Source: Author's computation

Figure 4 shows the welfare (real household consumption) effects of the AfCFTA. From the analysis, the implementation of the AfCFTA will result in aggregate welfare improvement for the continent, but this welfare effects vary across countries and regions. There will be negative but negligible (0.002%) welfare loss for the ROW. The AfCFTA will increase welfare in the ROA, Nigeria, Togo, Egypt, Tunisia, South Africa, Malawi, Kenya, Ethiopia, and Central Africa by 0.421%, 0.197%, 4.278%, 0.083%, 0.248%, 0.379%, 2.337%, 0.931%, 0.470% and 1.352% respectively. The uneven distribution of the potential economic benefits and welfare warrant a compensation mechanism to assist countries that may not enjoy significant welfare gains from the AfCFTA, while losing tax revenue.

DRAFT: NOT FOR PUBLICATION

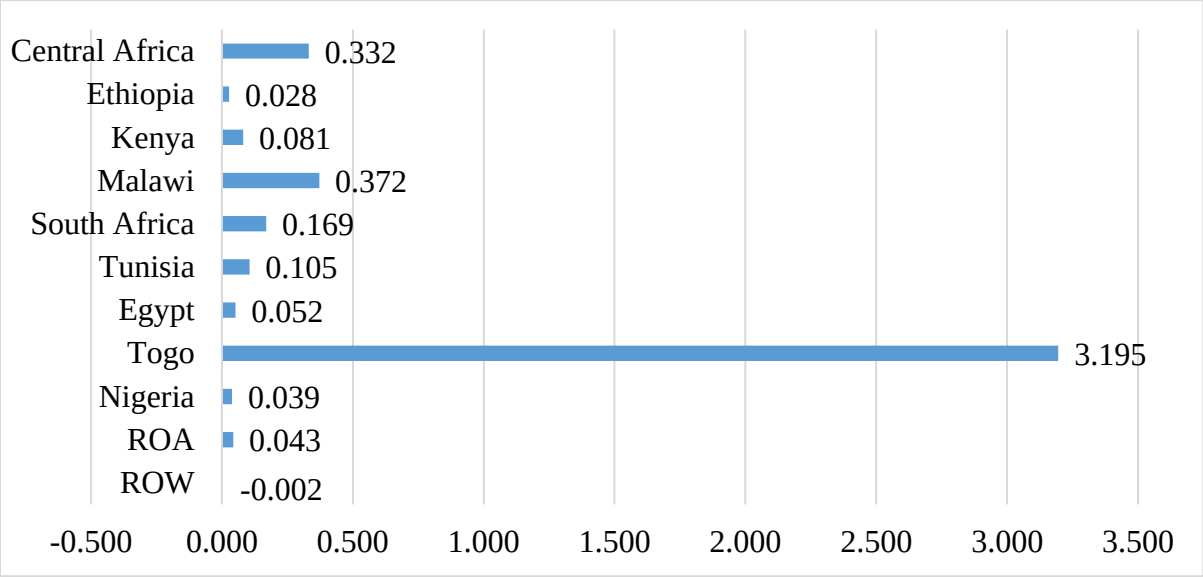
Figure 4: Welfare (Real household consumption)



Source: Author's computation

The implementation of the AfCFTA will also have mixed effects on the real GDP of different countries and regions (Figure 5). For example, the average real GDP of the ROW will decline marginally by 0.002%. The real GDP growth rates of African economies are not uniform. For example, while Togo is likely to experience a real GDP growth of 3.195%, Ethiopia's real GDP is only expected to grow by 0.028%.

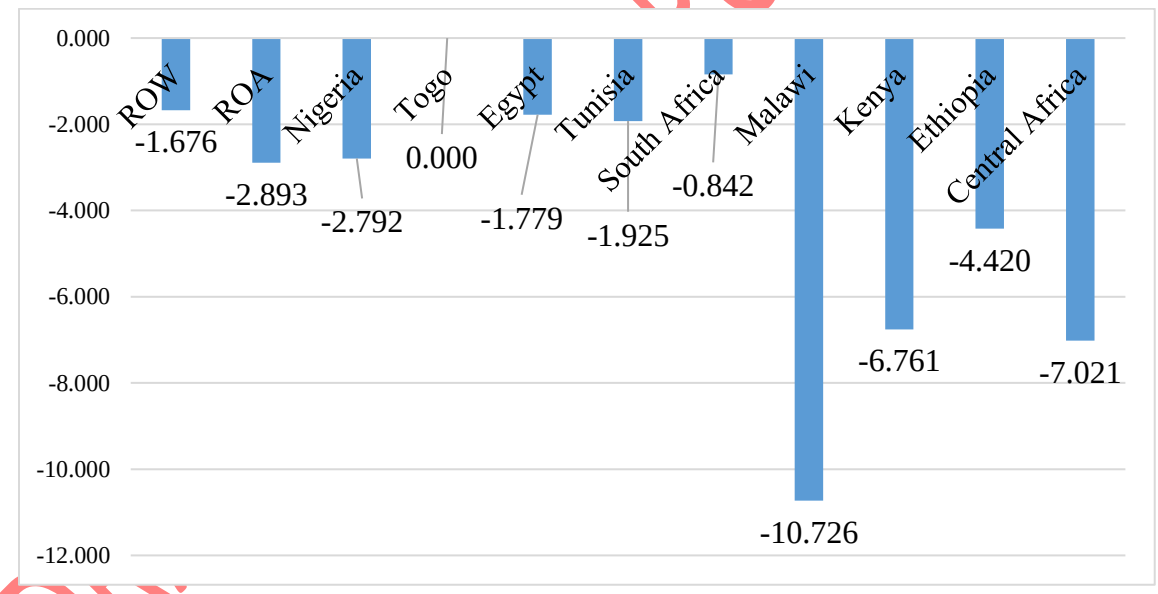
Figure 5: Real GDP at market price



Author's computation

One of the controversial aspects of the AfCFTA is the potential loss of import and export tax revenues and the effects on government finances. This effect is described in Figure 6, which summarises the impacts of the AfCFTA on total government revenue. As expected, aggregate government revenue will reduce. This is because import duties and export taxes constitute a significant proportion of total government revenue. But the degree of the effects on government revenue varies from one country to another, depending on the initial share of import and export taxes in overall government revenue. According to Figure 6, Malawi will experience the biggest decline in government revenue by 10.726%, followed by Central Africa and Kenya at 7.021% and 6.761% respectively. Government revenue in Nigeria, Togo, Egypt, Tunisia, South Africa, Ethiopia, and the ROA will reduce by 2.893%, 0.000%, 1.779%, 1.925%, 0.842%, 4.420% and 2.893% respectively. The varying degree of revenue losses among African countries may undermine commitment to the AfCFTA if adequate measures are not put in place to support countries with significant revenue losses.

Figure 6: Total government revenue



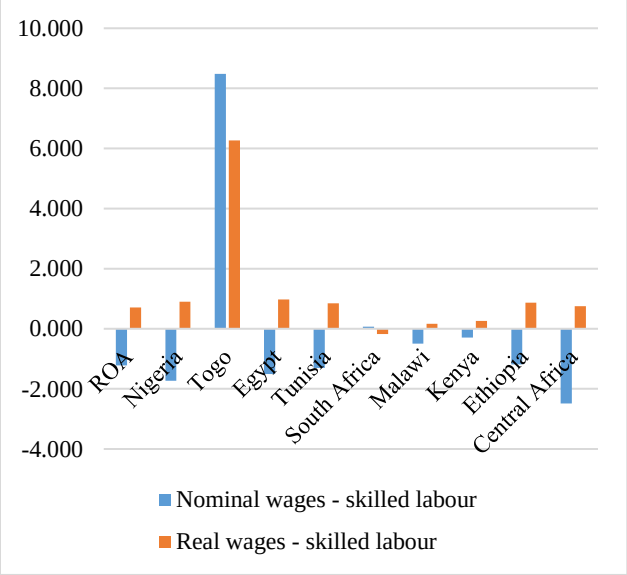
Source: Author's computation

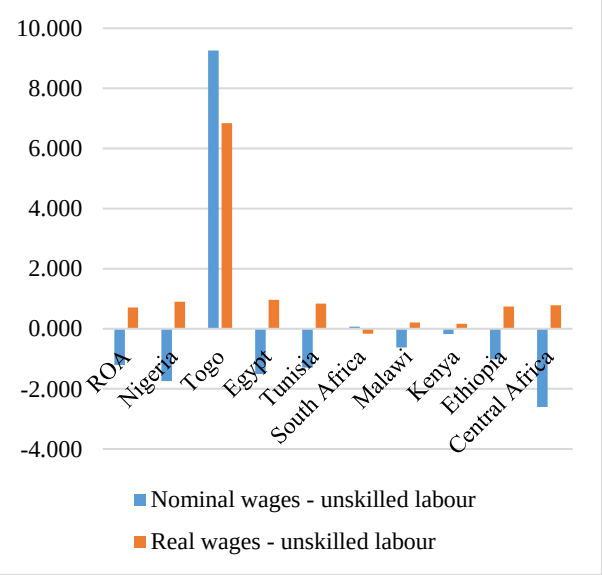
The ratification of the AfCFTA raised eyebrows among labour and workers unions across Africa. Specifically, the Nigerian Labour Congress (NLC) initially opposed the ratification of the agreement, arguing that it will stifle wages and lead to suppression of workers' rights. Hence, this study presents the impacts of the AfCFTA on real wages for skilled (Figure 7a) and unskilled labour (Figure 7b). For individual countries under review in this study, the AfCFTA have very

DRAFT NOT FOR PUBLICATION

similar effects on skilled and unskilled labour. Nominal wages for skilled and unskilled labour across AfCFTA member states will decline. The decline may be as a result of the increased supply of labor from across the continent. However, when the changes in the consumer price index (CPI) is factored in, the real wages for skilled and unskilled labour will increase in all the countries, except South Africa. Real wages for skilled and unskilled labour in Togo will increase by 6.266% and 6.841% respectively, but real wages for skilled and unskilled labour in South Africa will decline by 0.179% and 0.168%. These results suggest that the AfCFTA may have disproportionate effects on real wages. Hence, there should be a compensating mechanism to support the erosion of real wages to ensure that the benefits of the agreement is inclusive and "leave no one behind".

Figure 7a: Nominal/real wages (skilled labour) Figure 7b: Nominal/real wages (unskilled labour)





Author's computation

5.0 Conclusion and Recommendation

This study attempts to examine the potential economic and environmental impacts of the AfCFTA using a multi-region world CGE model calibrated on GTAP 7 database. The current version of the paper only looks at the economic aspects of the analysis, and further modeling is ongoing with respect to the environmental module.

The preliminary results show that while the AfCFTA will benefit the African continent (on average) in terms of welfare gains, these gains are spread disproportionally. Also, the implementation of the agreement will lead to loss of government revenue. The labour market

impacts are also not proportionally spread across the continent as real wages will increase in some countries and decrease in others.

Based on this preliminary results, it can be concluded that the AfCFTA will benefit the African continent in terms of welfare gains, but these gains are not proportionally distributed. Hence, complimentary policies should be implemented to support countries that experience economic and welfare losses as a result of the implementation of the agreement.

DRAFT: NOT FOR PUBLICATION

References

Armington, P. (1969). A theory of demand for products distinguished by place of production. *IMF Staff Papers No. 16,* 159-178, International Monetary Fund, Washington, DC.

Boko, M., Niang, I. Nyong, A. Vogel, C., Githeko, A., Medany, M., Osman-Elasha, B., Tabo, R. and Yanda, P. (2007). Africa. Climate Change 2007: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge UK, 433-467.

Cherniwchan, J. (2017). Trae liberalisation and the environment: Evidence from the NAFTA and the U.S. manufacturing. *Journal of International Economics, 105,* 130-149.

Chutto, R. (2019). The African Continental Free Trade Area: Will it promote fair trade, economic development and decent work? Industriall Global Union. Available at http://www.industriall-union.org/report-the-african-continental-free-trade-area-will-it-promote-fair-trade-economic-development-and

Decaluwé, B., Lemelin, A., Robichaud, V., and H. Maisonnave (2013). PEP-1-1: The PEP standard computable general equilibrium single-country - Static CGE model, Version 2.1". Partnership for Economic Policy (PEP), Nairobi, Kenya.

De Melo, J. (1988). Computable general equilibrium models for trade policy analysis in developing countries: A survey. *Journal of Policy Modeling, 10(4),* 469-503.

IMF (2019). Sub-Saharan Africa: Recovery amid elevated uncertainty. Regional Economic Outlook, World Economic and Financial Surveys (April). International Monetary Fund, Washington, DC.

Kirkpatrick, C. and Serban Scrieciu, S. (2007). Is trade liberalisation bad for the environment? A review of the economic evidence. *Journal of Environmental Planning and Management, 51*(4), 497-510.

Kolcava, D., Nguyen Q. and Bernauer, T. (2019). Does trade liberalisation lead to environmental burden shifting in the global economy? *Ecological Economics, 163*, 98-112.

Lemelin, A., Robichaud, V., Decaluwe, B. and Maisonnave, H. (2013). PWP-w-1: The PEP Standard multi-region, single period world CGE model. Partnership for Economic Policy, Nairobi, Kenya.

DRAFT: NOT FOR PUBLICATION

Li, J. C. (2005). Is there a trade-off between trade liberalisation and environmental quality? A CGE assessment on Thailand. *The Journal of Environment & Development, 14*(2), 252-277.

OECD (2000). Assessing the environmental effects of trade liberalisation agreements: Methodologies. OECD Publishing, Organisation for Economic Cooperation and Development, Paris, France.

Piermartini, R. and The, R. (2005). Demystifying modelling methods for trade policy. WTO Discussion Paper No. 10, World Trade Organisation, Geneva, Switzerland.

Robichaud, V. (2015). How to create input files for DATA_AGG.gms. Partnership for Economic Policy (PEP), Nairobi, Kenya.

Sisso, D. C., Sawadogo, B. and Natama, H. M. (2016). Decline in gold prices, tax receipts and employment: Which adaptation strategy for Burkina Faso. *PEP Working Paper No. 2016-28*, Partnership for Economic Policy, Nairobi.

Strutt, A. and Anderson, K. (2020). Will trade liberalisation harm the environment? The case of Indonesia to 2020. *Environmental and Resource Economics, 17*, 203-232.

Tariku, L. (2015). The impact of trade liberalisation on air pollution: In case of Ethiopia. *New Media and Mass communication, 40*, 43-55.

UNECA (2018, May 18). Continental Free Trade Area deal set to boost intra-African trade, says Ambassador Quartey. Communication Section, United Nations Economic Commission for Africa, Addis Ababa, Ethiopia.

UNECA and Friedrich Ebert Stiftung (2017). The Continental Free Trade Area (CFTA) in Africa: A human rights perspective. Friedrich-Ebert-Stiftung, Geneva, Office, Switzerland.

Wolfram, C., Shelef, O. and Gertler, P. (2012). How will energy demand develop in the developing world? *Journal of Economic Perspectives, 26*(1), 119-138.

World Bank (2020). The African Continental Free Trade Area: Economic and distributional effects. The World Bank Group, Washington, DC.

DRAFT: NOT FOR PUBLICATION

Appendix

Code and abbreviation of sectors

Sectors	agrc	Agriculture
	omin	Energy and other minerals and metal products
	pfood	Processed food and beverages and tobacco
	text	Textile and leather products
	wpp	Wood and paper products
	petch	Petroleum, coal, chemical, rubber and plastic products
	oman	Motor vehicles and parts, equipment and other manufactures
	util	Utilities
	cns	Construction
	trd	Trade
	transp	Transportation
	cmn	Communication
	fina	Financial services and insurance
	oserv	Other services
	osg	Public administration, defense, health and education
Factors	slab	Skilled labour
	ulab	Unskilled labour
	cap	Capital
	land	Land
	natr	Natural resources
Regions	ROW	Rest of the World
	ROA	Rest of Africa
	nga	Nigeria
	tgo	Togo
	egy	Egypt
	tun	Tunisia
	zaf	South Africa
	mwi	Malawi
	ken	Kenya
	eth	Ethiopia
	xcf	Central Africa

Source: Aggregation from GTAP database

DRAFT: NOT FOR PUBLICATION