

## Trade, Growth, and Welfare Impacts of the CFTA in Africa

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### **Abstract**

This paper provides a comprehensive and cohesive analysis of the likely effects of a Continental Free Trade Agreement (CFTA) in six African countries. Our analysis considers four incremental liberalisation scenarios. The first scenario consist in the elimination of tariffs for agricultural goods. In the second scenario we add the elimination of tariffs on manufactured goods. The third scenario adds a fifty percent reduction in NTMs. Our last scenario considers also a thirty percent reduction in transaction costs associated with time. This last scenario helps to illustrate the important role complementary policies may play in the integration process. We find that the trade, growth and welfare gains for each African country as a consequence of the implementation of a CFTA would depend on the modalities of trade liberalisation. We also find that the CFTA would lead to asymmetric changes in trade patterns among African countries and within countries across sectors. Finally, we find that the short-run impacts of CFTA are generally very small while the long-run impacts are instead positive. However, there is heterogeneity in the welfare effects in a given country and across countries.

**Keywords:** FTA; Africa; Integration; Welfare; CGE Model

**JEL codes:** F15; O24

# 1 Introduction

In the international context of mega-agreements, African countries are also going toward a deeper integration. This integration process started in 1991 with the Abuja Treaty, which launched the implementation of the African Economic Community (AEC). The step currently reached in the continental integration concerns the negotiation for a Free Trade Area and a Custom Union in each Regional Economic Community (REC).<sup>1</sup>

Few papers have addressed the evaluation of an African CFTA. Tanyi [19] compares the potential gains of the Continental Free Trade Agreement (CFTA) with the ASEAN and he found encouraging results for the whole continent; however, due to the disparities in tariffs, infrastructure, across their production structures and their socio-economic compositions, those gains would be unequivocally distributed across countries. Guimbard and Le Goff [9] look at the CFTA as a potential (but partial) counterbalance of trade diversions effects suffered by the Sub-Saharan African countries due to other mega-agreement worldwide. Cheong et al. [14] focus exclusively on agricultural trade and development due to the implementation of the CFTA. Both papers simulate the CFTA with the same CGE model looking at macroeconomic and sector effects, but none of them compare different modalities of trade liberalisation through the CFTA nor look at the detailed welfare of households using surveys of African countries to measure that impact across quintiles of incomes. Both Tanyi [19] and Guimbard and Le Goff [9] agree on the necessity to improve trade facilitation measures in addition to tariff elimination.

The objective of this paper is to provide a comprehensive and cohesive analysis of the likely effects of a Continental Free Trade Agreement (CFTA) in Africa on trade, growth and welfare, the latter being also computed at the household level. We provide a robust quantitative methodology to analyse the short and long term impact of the CFTA. Households' welfare is computed for six African countries: Burkina Faso, Cameroon, Cote d'Ivoire, Ethiopia, Madagascar, and Nigeria. Our simulations of the CFTA consider four incremental liberalisation scenarios: (CFTA T-Agri) tariffs elimination for agricultural goods; (CFTA T) tariffs elimination on agricultural and manufactured goods; (CFTA T & NTM) tariffs elimination on agricultural and manufactured goods and a fifty percent reduction in Non-Tariff Measures (NTMs); (CFTA T & NTM & TC) tariffs elimination on agricultural and manufactured goods, a fifty percent reduction in NTMs and a thirty percent reduction in transaction costs associated with time. This last scenario helps to illustrate the important role complementary policies may play in the integration process.

This paper is organised as follows. Section 2 shortly presents the two-stage methodological approach. Section 3 discusses the results for trade, growth and an aggregate measure of welfare for African countries. Section 4 describes the short-run and long-run results of the CFTA on the households welfare across quintiles of income. Then we discuss the long-run effects according to gender and regional localisation of households across the six SSA countries. Finally, in the

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<sup>1</sup>The West African Economic and Monetary Union (WAEMU) and the Economic and Monetary Community of Central Africa (EMCCA), are monetary unions; the East African Community (EAC) has a common market; the Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC) are custom unions; and the Economic Community of Central African States (ECCAS), the Economic Community of West African States (ECOWAS) are free trade areas. Moreover, a Tripartite Free Trade Area includes countries of COMESA, EAC and SADC.

Section 5 we present our final remarks.

## 2 How to track the Continental Free Trade Area Impact?: A two-stage approach

### 2.1 First stage: CFTA simulation under a CGE model

The assessment of the implementation of a Continental Free Trade Area (tariff and NTMs reductions) in Africa under different proposed scenarios is undertaken, in a first stage, using a recursive-dynamic, multi-region and multi-sector Computable General Equilibrium model, the MIRAGE-e CGE model [6]. The advantage of CGE models is that they capture not only the direct but also the indirect effects of the shocks behind this type of agreements.

The main assumptions of the Mirage-e model are that there is a single national agent by country/region on the demand side that earns and consumes national and imported products (Armington assumption) and where the total demand is composed by intermediate and final goods and the demand of capital goods. On the supply side, the production function combines in fixed proportion intermediate consumption goods with value added, where the different production factors (labour, land, capital natural resources and energy) are imperfect substitutable according to a particular CES tree function. All markets clear under perfect competition conditions. Mirage-e assumes the traditional closures (e.g., investment is saving driven, endogenous real exchange rate) of this kind of models and the dynamic baseline (2007-2030) is built on the MaGE growth model projections on GDP, savings, total and active populations,<sup>2</sup> energy efficiency,<sup>3</sup> and current account balances (see the annex for more technical details about the Mirage-e model).

The Mirage-e model provides changes in macroeconomic (e.g., welfare, GDP, terms of trade), and sector variables (e.g., production, trade, prices) for the African countries involved in this agreement and also for their traditional trade partners outside the continent (e.g., the European Union, USA, Japan, China, India, Brazil and others). Production, consumption and export prices, as well as, production factors (capital, land, natural resources, skilled and unskilled labours) returns are essential outputs from this model that serve as input for the second step in this methodology, that are the microsimulations of the welfare impacts using household data for a number of African countries.

#### 2.1.1 Calibration data

The MIRAGE-e model was calibrated using the Global Social Account Matrix from the GTAP (version 8.1),<sup>4</sup> with 2007 as the base year. The 57 sectors from the GTAP database have been aggregated into 21 sectors to match the goods and services classification (3 digit level) of the household surveys of African countries that will be used to estimate later the welfare

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<sup>2</sup>The MaGE model also provides projections about the skill composition of the active population (human capital) in each country.

<sup>3</sup>The total amount of energy used in each sector of each region is affected by a parameter of productivity improvement (i.e. energy efficiency), which is estimated and projected by the MaGE model.

<sup>4</sup>For more details, see the GTAP website: <https://www.gtap.agecon.purdue.edu/databases/v8/default.asp>

impact using micro simulations. From the 134 countries/regions in the original database, we have retained 31 aggregated countries/regions: 20 African countries and regions, 10 traditional trade partners of African countries (e.g., the European Union and the United States of America, among others), and the Rest of the World aggregate in a single region (Table 1).

Table 1: Country and sector aggregation

Two categories of countries, 31 countries/regions	Three categories of goods, 21 sectors
<i>CFTA members</i>	<i>Agriculture and Food products</i>
Maghreb and Egypt	111 124 Cereals and Bread
Benin	112 113 114 126 Fruits and Vegetables
Burkina Faso	123 Oil seeds
Cameroon	119 Other Staple food
Cote d'Ivoire	127 Cotton
Ghana	117 Meat and livestock
Guinea	118 Dairy products
Nigeria	116 Fish
Senegal	115 Vegetable oil and fats
Rest of Africa	121 122 125 Tobacco and Beverages
Rest of Western Africa (Gambia)	<i>Energy and manufacturing products</i>
Ethiopia	210 Energy
Madagascar	220 Textile apparel
Malawi	240 Household items and furniture
Mozambique	250 Other Physical goods
Rwanda	230 Electronic and electrical goods
Tanzania	<i>Services</i>
Uganda	350 Other services
Botswana	310 Transportation
South Africa	340 Communication
<i>Traditional African trade partners</i>	430 Festivities
China	320 330 Health and Education
Japan	310 Transportation
Republic of Korea	<i>Rest of goods and services</i>
India	
United States of America	
Brazil	
European Union	
EFTA	
Russia	
Gulf Cooperation Council	
<i>Rest of the World</i>	

In order to get a better representation of worldwide trade protection, tariffs from the MacMap-HS6 dataset [8] are used.<sup>5</sup> In this study, the CFTA is simulated as the bilateral applied tariff elimination between African members. To reconstruct tariff profiles at the sectoral and regional levels, AVE applied tariffs are calculated by aggregating remaining (non-zero) tariffs in the 21 sectors and 31 regions by using the reference group weighting scheme developed for MacMap-HS6 [1]. Moreover, the model includes international transaction costs related to time (e.g. delays in customs) modelled as an iceberg cost and calibrated using the database from Minor and Tsigas [15], who adopt the methodology used in Hummels and Schaur [10]. Trade in goods is also limited by non-tariff measures (NTM) in this model. These NTM are incorporated as part of transaction costs following the same modelling approach already de-

<sup>5</sup>This dataset provides AVEs of applied tariffs for each HS-6 product in bilateral trade between two countries for 2001, 2004, and 2007. MacMap-HS-6 allows for simulating regional and multilateral trade liberalisation through cuts in bound tariffs, and then calculating their impact on the effectively applied tariffs at the HS-6 level.

scribed. To calibrate NTMs in goods we rely on the last release (July 2012) of the World Bank NTM dataset of equivalent ad-valorem measure for 2007 [11, 12, 13]. To maintain the coherence with the sector and region aggregation for other forms of protection, we use the reference group weighting scheme from the MAcMap-HS6 dataset.

### 2.1.2 Which CFTA scenarios simulate? scenarios' description

In order to achieve the measuring of the economic consequences of the CFTA in Africa we compare an assumed baseline scenario for the world economy, and then over that we run the scenarios of the CFTA and compare the two different trajectories.

#### The Baseline

The reference dynamic scenario considers the standard projections from the MaGE model [7] about population growth (total and active population, by gender, by level of education, etc.), GDP growth, capital formation, energy productivity in each country of the world, and also the exogenous assumptions about the evolution of energy world prices.

Even if technically it is possible to include any already implemented preferential trade agreements (PTA) in the region (e.g. Tripartite FTA<sup>6</sup>), none of them have been particularly included in the baseline. For instance, the consideration of the Tripartite FTA in the baseline could reduce the benefits/losses of the CFTA for some African partners; however, given the low level of ambition of the Tripartite FTA compared with the magnitude of shocks in the simulated scenarios of the CFTA in this paper, the overstatement of the results is almost negligible.

This baseline scenario is run from 2007 until 2030 in the version of the model we use for this project.

#### The CFTA scenarios

In order to capture the positive and negative impacts of each stages of the FTA in Africa we run the following scenarios as additive (see Table 2).

Table 2: Scenarios of the Continental Free Trade Agreement in Africa

Scenarios	Variables	Shocks
CFTA T-Agri	Tariffs in agricultural products	-100 per cent by 2027
CFTA T	Tariffs in all goods	-100 per cent by 2027
CFTA T & NTM	Tariffs in all goods	-100 per cent by 2027
	NTMs in all goods	-50 per cent by 2027
CFTA T & NTM & TC	Tariffs in all goods	-100 per cent by 2027
	NTMs in all goods	-50 per cent by 2027
	Transaction Costs in all goods	-30 per cent by 2027

The first scenario (CFTA T-Agri) assumes tariff elimination on primary and agricultural trade between African countries. This scenario is interesting given the current protection disparity across African countries and the sensitivity of some particular agricultural products for some African economies (e.g. cotton, tobacco, coffee, etc.). As an example, Table 1 in Annexes shows the simple average of intra-Africa applied tariffs on some selected products. Applied tariffs (and tariff dispersion) on cotton between African countries are already low because the

<sup>6</sup>The consolidation of the East African Community (EAC), the Common Market and Southern Africa (COMESA) and Southern African Development Community (SADC) in a Tripartite FTA by 2014-2015 is still under negotiation and no precise schedule of trade liberalisation has been already confirmed.

current preferences granted under the existent African agreements (e.g., Benin, Cote d'Ivoire and Senegal grant duty free access for cotton under the West African Economic and Monetary Union (WAEMU), and Cameroon grants preferential duty rates for the Central African Economic and Monetary Community (CAEMC)). However, applied tariffs on tobacco and cereals (including rice) remain high among African partners. Tariffs on energy show a large dispersion across African countries: while Botswana and South Africa grant a duty free access, in Tanzania and Guinea the energy trade tariff protection remains high.

In the second scenario (CFTA T), we liberalize all intra-Africa trade, including not only agricultural and primary goods but also manufactures. As it is shown in Table 2 in Annexes trade in manufactured goods is more protected between African partners, thus it is expected that the additional liberalisation of this kind of products would provide greater trade and welfare variations compared with the liberalisation of only agricultural and primary trade. Except in Madagascar, the simple average tariff applied on textiles are not lower than 10%, and in Botswana, Cameroon, Ethiopia, Rwanda and Uganda, these intra-Africa tariffs are equal or greater than 20%. Applied tariffs on the rest of manufactures between African countries do not exceed 17%. Duty free access is also observed (MIN tariffs) and they are explained by the current PTA in the continent.

The third scenario (CFTA T & NTM) adds a 50 per cent reduction in Non-Tariff Measures on goods between African countries to the previous scenario of intra-Africa tariff elimination on goods. The magnitude of this shock is in line with the literature [20] and practically requires transparency in the notification of norms, the harmonization of the Sanitary and Phyto-sanitary (SPS) regulation between partners, and the accreditation and mutual recognition procedures for Technical Barriers to Trade (TBT) requirements in compliance with the international standards. These are long-run objectives that are not costless in the short run and requires to facilitate capacity-building in the region. Compared to the simple tariff elimination, which basically changes the terms of trade and the allocative efficiency, the reduction of NTMs would also reduce trade costs and improve market access conditions for exporters. Table 3 in Annexes shows the average ad-valorem equivalent (AVE) of NTMs in the African countries/regions for a group of selected products. NTMs are high on average in the four selected sectors but Vegetables and Fruits and Electric and Electronic devices also display a greater dispersion, with maximum values that exceed 100% of NTM protection (e.g. for Vegetables and Fruits in Benin, Cameroon, Guinea, Mozambique and South Africa; for Electric and Electronic devices in all countries except for Botswana, Guinea, Mozambique, South Africa, Senegal, Tanzania and Uganda). In the case of agricultural and food product the SPS regulation is the main component (more than 60 per cent of the ad-valorem equivalent) of the NTMs; however, in manufactured goods such as machinery and vehicles (included in the aggregate Household items and furniture) and Electronic devices, TBTs cover around 50 per cent of the AVE NTMs in Africa [2].

Finally, given that the CFTA could contribute to improve the administrative conditions in customs in the long-run, we also add a fourth scenario (CFTA T & NTM & TC) where we also consider a 30 per cent reduction in trade costs linked to time. As in the case of the reduction in the restrictiveness of the NTMs, this kind of trade costs reductions require complementary policy within and between countries and the investment in infrastructure. This implies that this

is not an objective that can be easily achieved in the short run. Table 4 in Annexes shows average (across sectors) transaction costs linked to time between African partners and provides an idea of the magnitude of costs that impede or restrain bilateral trade between some countries/regions in Africa. For instance, transaction costs could be lower between neighbouring countries because of geographical proximity (e.g. Benin and Burkina Faso vs. Benin and Rwanda) improving bilateral trade relations. But the degree of development of the transport network (i.e., paved road, railways, airports, seaports) and bureaucratic administration also determine this kind of costs and bilateral relations between African countries (e.g. low transaction costs between Benin and South Africa because of sea transport connections and infrastructure compared to those between Benin and Cote d'Ivoire where bureaucratic red tape and the complexity of logistic increase trade costs).

In our study, all CFTA scenarios are implemented starting 2017 and in a linear phase-out period of 10 years, since a gradual process would reduce integration costs particularly given the disparities between countries and the presence of sensitive sectors.

## **2.2 Second stage: CFTA's households welfare impact through Microsimulations**

To evaluate the welfare impact at the household level, we follow the literature on trade and poverty [3, 4, 5, 17, 16, 18] in using a two-stage analytical framework. In the first stage, the CFTA trade scenarios presented above directly affect the prices of goods and factor remunerations, taking into account direct and indirect effect from the relations modelled in the CGE approach [6]. This recursive dynamic CGE model generates an entire temporal series of price changes. We thus illustrate results defining a short-run simulation, which is given by the price shock one year after the implementation of CFTA (2016), and a long-run simulation, which is defined as the cumulative price effect over the simulation horizon of the CFTA simulation.

In the second stage, price and remuneration changes affect household incomes and expenditures. On the consumption side, consumers are worse off if prices go up but are better off if prices go down. In a first order approximation, these impacts can be measured with budget shares. On the income side, there is also a direct impact on profits (if the household produces the goods) which depends on the share of income attributed to these goods. In rural economies, this source of income can account for a large fraction of total income. In more urbanized economies with more developed labour markets, the role of the direct production of (agricultural) goods will be much less important. In a small open economy that faces exogenous commodity prices (determined in international markets), wages will respond to changes in those prices mainly because the demand for labour depends on prices. Changes in relative product prices cause some sectors to expand and some others to contract. If sectors use factors of production in different proportions, then the relative demand for factors will change. We are particularly interested in these effects for different types of labour, including unskilled versus skilled labour, female versus male labour, and combinations thereof (unskilled females versus unskilled male labour, and so on). These impacts on labour income depend on the share of income contributed by the wages of different members. Clearly, if countries differ in technologies, endowments, or labour regulations, the responses of equilibrium wages to prices can be heterogeneous across different

economies. To estimate the welfare effects of the CFTA at the household level we need information of the exposure of each household as consumers and producers of different goods and as wage earners. This information is provided by household surveys. However, coverage, availability and comparability of these surveys vary largely among African countries. For that reason, the welfare analysis is carried out only for six African countries (Burkina Faso, Cameroon, Cote d'Ivoire, Ethiopia, Madagascar, and Nigeria) for which survey data can be harmonized.<sup>7</sup>

### 3 Results of the simulated CFTA scenarios

In this section we only discuss the implications for trade, growth and welfare for six SSA countries for which we are interested to further evaluate poverty consequences of the CFTA scenarios described above; however, results are available for the rest of countries/regions and also for other indicators.

#### 3.1 Uneven trade impact of the CFTA in Africa

The liberalisation of intra Africa trade would lead to an asymmetric increase in trade across African countries. These results also vary across the different simulated scenarios.

Figure 1 shows that tariff elimination in agricultural goods would increase national trade between 8.5 per cent (Cameroon) and 0.04 per cent (Botswana) in 2027 compared with the dynamic baseline. Even if this is a quite important difference in trade gains across African countries, this gap becomes even larger when we introduce further trade liberalisation (i.e., all tariff elimination, reduction in NTMs and transaction costs). The additional liberalisation of manufactures among African countries shows an increase in trade that varies between 42 per cent (Mozambique) and -0.14 per cent (Botswana). These different responses are partially explained by the current disparities in tariffs across African countries. These divergences may complicate the convergence to a CET in the future, when this process of integration could achieve the status of a custom union.

Non-Tariff Measures in goods generally appears as an important trade barrier between African countries and their most developed partners (i.e. the European Union, the United States, Japan, etc). In the case of NTMs between African adds an additional complexity to the CFTA. For some countries, such as Botswana and Madagascar, the reduction in NTMs in goods appears as the real motivation to be part of the CFTA since tariff elimination are not an issue for them under this framework. The rest of African countries considerably increase their exports due to the NTMs reduction, but once again, Mozambique, and also Cote d'Ivoire and Senegal, are the economies that would benefits the most of this liberalisation process.

Finally, if we assume that the CFTA would improve transport and administrative conditions in customs reducing transaction costs in 30 per cent, exports for every African country would increase even more. Ghana is one of these countries for which the reduction in transactions costs is crucial to increase trade, leading to an additional export rise of 55 per cent points compared

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<sup>7</sup>The households survey considered are: Burkina Faso, Enquete Burkinabe Sur Les Conditions de Vie des Menages, 2003; Cameroon, Deuxieme Enquete Camerounaise Aupres des Menages, 2001; Cote d'Ivoire, Enquete Niveau de Vie des Menages, 2002; Ethiopia, Household Income, Consumption and Expenditure Survey, 2000; Madagascar, Enquete Periodique Aupres des Menages, 2005; Nigeria Living Standards Survey, 2004.



with the tariff elimination and the NTMs reduction scenarios.

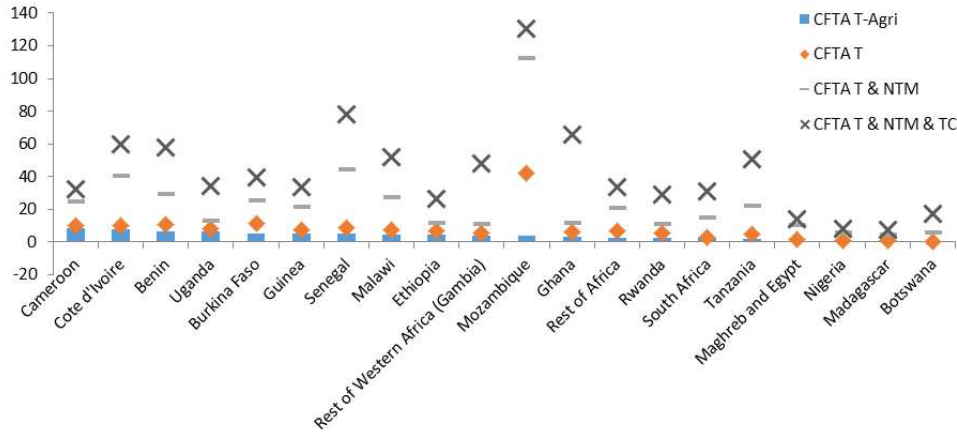


Figure 1: Unevenly distributed increase in total exports across CFTA scenarios, 2027. % increase in gross exports (volume) as compared with the baseline by 2027.

Improving intra-Africa trade will deteriorate trade relation with some traditional trade partners outside the continent, i.e. with the European Union, the United States, China and Brazil particularly. Moreover, trade diversion is not only present with partners outside Africa but also with other African countries. For instance, Ghana deteriorates its bilateral trade relation with Malawi, and Burkina Faso suffers the same with Cameroon, Guinea and Malawi because of the current tariff preference erosion and the lower impact of trade facilitation.

In terms of exports and import at the sector level, the expected changes would also be different among African countries. Those changes would depend on the level of trade protection at the moment the CFTA enters into force, the intra-Africa trade liberalisation modalities considered in each scenario and particularly on the comparative advantages of each country. For instance, the completion of the CFTA in the case of Benin shows a decrease in cotton exports while textile exports increase, where export variations intensify with greater trade openness in this country (comparison across scenarios). Benin’s imports will also increase in textiles, as well as in energy (this country is a net importer of energy and under this scenario its demand will increase), other household items and furniture, and other staple food.

Since the change in trade patterns are not the same for every African country, it is important to look at each country situation in terms bilateral trade as well as trade in each sector.

Burkina Faso total trade is positively affected by the CFTA completion in 2027 under any of the four modalities considered. However, the reduction of the NTMs and trade costs would lead to greater trade increase leading to a terms of trade improvement tariff elimination only deteriorates terms of trade. Conversely, in the short run the CFTA reduce imports and exports, and even the terms of trade of this country deteriorate under any of the four scenarios (see Table 3: Burkina Faso).

Burkina Faso’s bilateral trade relations are more diversified than those of other African countries. The completion of the CFTA deteriorates current trade relations between Burkina

Table 3: Total trade indicators under the CFTA scenarios for the six SSA countries - % change compared to the baseline in the short (2017) and the long (2027) run

Variable	CFTA T-Agri		CFTA T		CFTA T & NTM		CFTA T & NTM & TC		
	2017	2027	2017	2027	2017	2027	2017	2027	
Burkina Faso	Exports (val)	-0.01	4.73	-0.02	9.31	-0.73	19.98	-1.74	29.32
	Exports (vol)	-0.01	5.39	-0.02	11.01	-0.91	25.63	-2.1	39.18
	Imports (val)	-0.01	4.92	-0.02	9.68	-0.74	20.78	-1.75	30.49
	Imports (vol)	-0.01	4.89	-0.02	10.62	-1.18	31.4	-2.65	48.13
	Terms of trade	0	-0.85	0	-1.24	-0.32	3.18	-0.63	5.19
Cameroon	Exports (val)	0	8.1	0	9.35	-0.62	21.94	-1.11	27.52
	Exports (vol)	0	8.51	0	9.74	-0.71	24.78	-1.25	32.35
	Imports (val)	0	8.81	0	10.2	-0.64	23.91	-1.14	30.02
	Imports (vol)	0	9.47	0	10.92	-0.86	34.73	-1.41	43.01
	Terms of trade	0	-0.25	0	-0.27	-0.09	2.02	-0.08	1.88
Cote d'Ivoire	Exports (val)	-0.01	9.32	-0.01	12	-1.3	34.76	-2.28	46.87
	Exports (vol)	-0.01	7.48	-0.01	9.73	-1.54	41.1	-2.66	59.85
	Imports (val)	-0.01	9.92	-0.01	12.77	-1.36	36.99	-2.38	49.87
	Imports (vol)	-0.01	10.12	-0.01	12.96	-1.65	45.72	-2.72	61
	Terms of trade	0	2.02	0	2.47	-0.02	2.75	0.08	1.19
Ethiopia	Exports (val)	-0.01	4.58	-0.01	6.64	-0.16	10.92	-0.56	20.14
	Exports (vol)	-0.02	4.26	-0.02	6.53	-0.2	11.96	-0.67	26.25
	Imports (val)	-0.01	4.16	-0.01	6.04	-0.12	9.95	-0.43	18.35
	Imports (vol)	-0.01	4.08	-0.01	5.91	-0.19	12.98	-0.59	27.48
	Terms of trade	0	0.55	0	0.33	-0.04	1.25	-0.1	2.56
Madagascar	Exports (val)	0	0.38	0	0.74	-0.17	3.93	-0.41	5.94
	Exports (vol)	0	0.36	0	0.71	-0.21	4.68	-0.5	7.36
	Imports (val)	0	0.35	0	0.67	-0.15	3.57	-0.37	5.4
	Imports (vol)	0	0.36	0	0.71	-0.26	6.68	-0.57	9.91
	Terms of trade	0	0.03	0	0.06	-0.06	1.14	-0.11	1.5
Nigeria	Exports (val)	0	0.47	0	0.96	-0.13	3.96	-0.19	5.47
	Exports (vol)	0	0.46	0	0.91	-0.17	6.15	-0.23	8.18
	Imports (val)	0	0.6	0	1.21	-0.17	5.03	-0.25	6.95
	Imports (vol)	0	0.65	0	1.28	-0.2	6.67	-0.33	10.4
	Terms of trade	0	0.01	0	0.03	0.01	-0.32	-0.04	0.3

Faso and its trade partners outside Africa (all scenarios); however, the intensification of the Africa integration increases its bilateral trade with Senegal and other countries included in the region Rest of Africa. The reduction of the NTMs and transaction costs are the key component of the agreement to improve Burkina Faso's intra-Africa relations.

Nevertheless, the CFTA could also erode current trade preferences between African countries. This is the case of the trade relation between Burkina Faso and Cote d'Ivoire, whose share in total Burkina Faso's trade falls not only because of tariff elimination but particularly when the improvement in trade facilitation improves with all countries in the continent. Thus, trade between these bordering countries is negatively affected by the improvement of trade conditions between Burkina Faso and other farer African countries (Figure 2 - Burkina Faso).

The composition of Burkina Faso's export does not change much compared to the reference situation by 2027 (Ref). Cotton and energy, which are traditionally exported by this country slightly reduce their participation in the sectoral exports; however, exports of textile slightly increase its shares. The situation in imports is more diversified. This country increases the shares in household items and furniture and other goods and services when intra-Africa tariffs are eliminated, and energy imports particularly increase when trade facilitation improves (Figure 7).

The CFTA would increase Cameroon total trade in the long run. Intra-Africa tariff elimination on agrofood and energy would increase imports and exports but the elimination of tariffs in manufactures would not add much more gains in trade. Conversely, the reduction in NTMs and trade costs would particularly increase exports and imports by also improving Cameroon's terms of trade (see Table 3 - Cameroon).

The characteristics of the Cameroon bilateral trade are similar to those from Botswana, where bilateral trade ties are concentrated with a few partners, and particular with the European Union because of its present concession in terms of trade preferences to Cameroon (GSP and more recently the accession to the Economic Partnership Agreement EPA, in 2014). This situation deteriorates with the implementation of the CFTA particularly when tariff and transaction costs between African countries are reduced. Nevertheless, bilateral trade relations improve between Cameroon and other African partners, such as Guinea, Senegal, Maghreb and Egypt, under almost all CFTA scenarios. Cameroon's trade relations with other African countries insignificantly change (Figure 2 - Cameroon).

In Cameroon the export pattern shows a greater participation of energy exports while cereals and services reduce their share in total exports. For the rest of products and services the export shares do not display significant modifications. Imports considerably increases in energy (its import share almost doubles under the most complete CFTA scenario) while they fall in household items and furniture, other goods and services (Figure 3 - Cameroon).

In Cote d'Ivoire the implementation of the CFTA in any of its modalities would increase more imports than exports, also improving its terms of trade in the long run. As in the case of the previous countries in the short run Cote d'Ivoire trade would be negatively affected. Trade increases are greater when NTMs and trade costs are lower (see Table 3 - Cote d'Ivoire).

As it was the case for other African countries mentioned before, Cote d'Ivoire currently displays an important trade relation with the European Union that according to the model

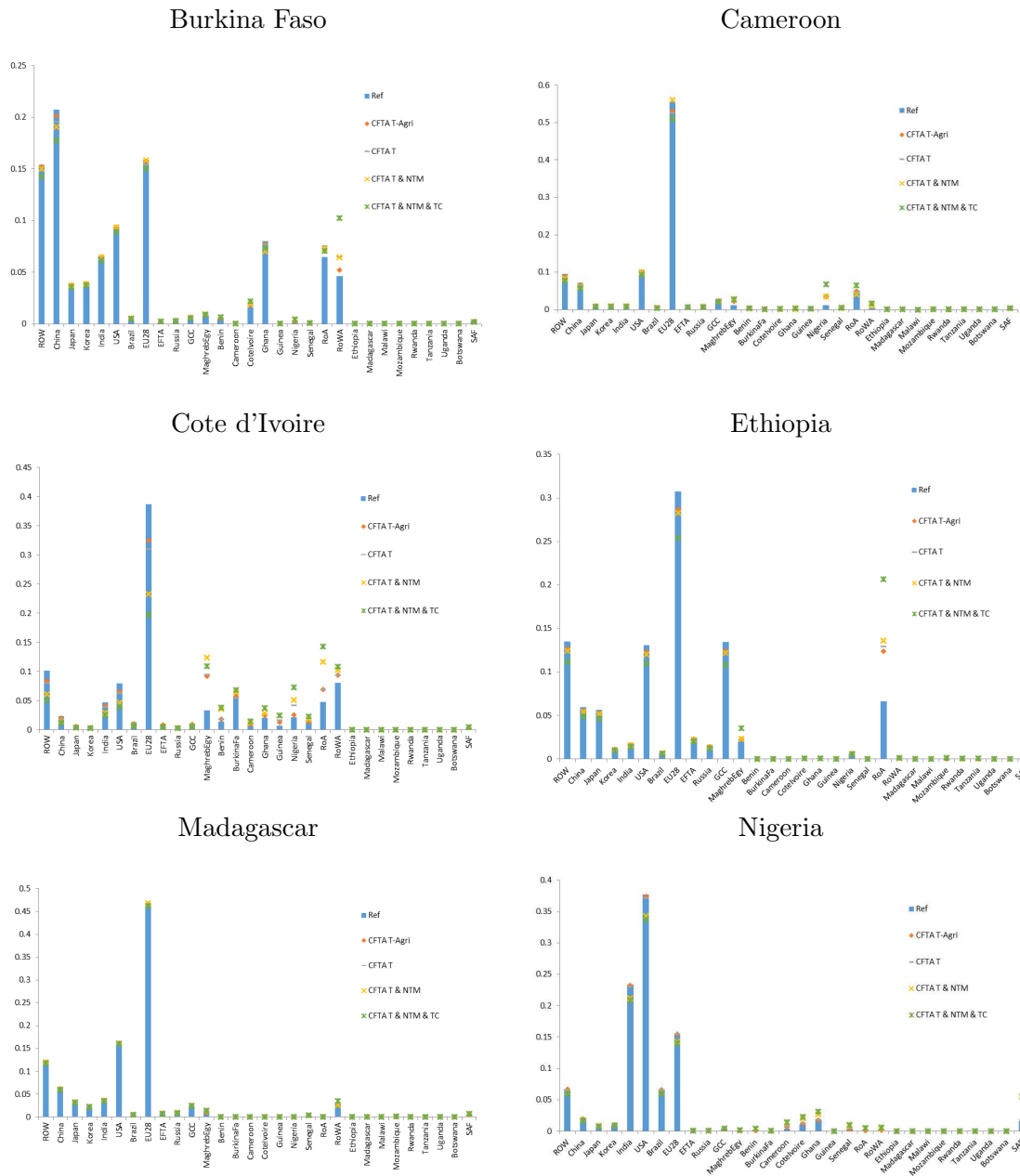


Figure 2: Change in bilateral trade relations of the six SSA under the CFTA scenarios. % change in bilateral trade shares in total national trade (value, FOB prices) by 2027.

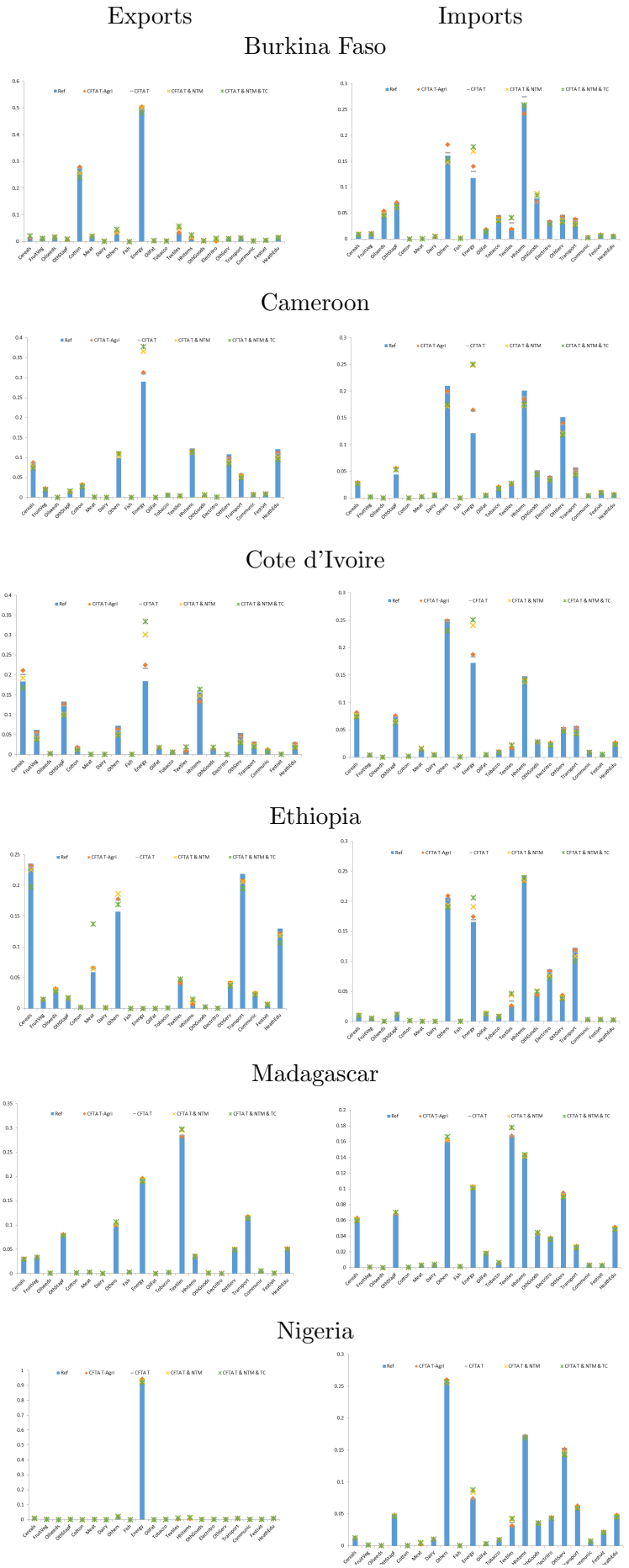


Figure 3: Changes in sectoral trade pattern of the six SSA under the CFTA scenarios. % change in export and import shares in the total national trade by 2027.

projection would achieve almost 40 per cent of the total national exports under the baseline scenario. This situation shown in the reference baseline by 2027 deteriorates if the CFTA is implemented. For instance, the share of the European Union could be reduced to 20 percent under the most ambitious scenario. The same dynamics is true for Cote d'Ivoire bilateral trade with other partners outside Africa, i.e. the United States, India, China and the Rest of the World. Nonetheless, bilateral trade relation of this country intensifies with other African partners (e.g., Maghreb and Egypt, Benin, Nigeria, Ghana, the rest of Westerns African and other countries of the Rest of Africa) (see Figure 2 - Cote d'Ivoire).

Current export pattern in Cote d'Ivoire intensifies by increasing the export shares of the products traditionally exported by this country (i.e., cereal, energy and household items and furniture). For instance, cereals export share increases when tariff in agriculture are eliminated but falls when the most complete CFTA scenario is implemented. Export and import shares particularly increase in energy under any of scenario (Figure 3 - Cote d'Ivoire).

Ethiopia also increase its imports and export as a consequence of the implementation of the CFTA (all scenarios) in the long run; however, percentage variations are moderate compared to Cote d'Ivoire described before. Here, exports increase more than imports and also terms of trade improves by 2027 under any of the scenarios considered. Negative variations in all trade variables are observed in the short run for this country but those losses are more than compensated in the future (see Table 3 - Ethiopia).

Ethiopia's bilateral trade relations with its partners outside Africa (European Union, the Gulf Cooperation countries, the United States, China, Japan and the Rest of the World) are negatively affected, while its trade ties only increase with Maghreb and Egypt and the countries in the Rest of Africa aggregate (Figure 2 - Ethiopia).

In Ethiopia the export pattern in the baseline by 2027 would change for some sectors: while meat and other goods and services increases their export shares, cereals and transport exports shares fall. In the case of imports, the pattern would be modified slightly with a greater participation of energy and textiles (Figure 3 - Ethiopia).

Compared with the previous countries, Madagascar displays a lower trade increase under every CFTA scenario in the long run. Moreover, while intra-Africa tariff elimination slightly increases more exports than imports, the reduction in the AVE of NTMs and transaction costs facilitates a greater increase in imports than exports for this country. Terms of trade deteriorates in the short run but improves in the long one (see Table 3 - Madagascar).

The implementation of the CFTA would not lead to significant changes in bilateral trade relations of Madagascar. While the participation of non-African countries slightly deteriorates, the increase in trade shares for African ones is almost imperceptible. The CFTA scenario that also reduces transaction costs between African countries would lead to slightly greater variations for this country (Figure 2 - Madagascar).

At the sectoral level, changes in the trade pattern of Madagascar are almost negligible, except for Textiles and the aggregate Other goods and services, where exports and imports shares slightly increase (Figure 3 - Madagascar).

Nigeria's trade increases under all CFTA scenarios compared to the baseline by 2027 (imports more than exports); however, the percentage variations are considerably smaller than

for most of previous countries. The intra-Africa tariff elimination on goods does not lead to significant trade increase but the combination of NTMs and trade costs reduction could make that the CFTA become a profitable agreement for Nigeria. Terms of trade slightly change even in the most ambitious scenario (see Table 3 - Nigeria).

The African FTA would lead to increase trade shares between Nigeria and its neighboring trade partners (Cameroon, Cote d'Ivoire and Ghana) and also with South Africa, which is an important trade partner in the continent. For those countries the reduction in transaction costs is essential to significantly increase their participation in Nigerias trade. However, the improvement of trade relations between African countries is in detriment to trade relations with the rest of the world, particularly affecting trade with the US, the EU, India and Brazil (Figure 2 - Nigeria).

For Nigeria, the CFTA does not lead to significant changes in its trade sectoral pattern. This country will continue to be a net exporter of Energy (even if its imports share increases). In the case of imports, Textiles would seen an increase of its share in total Nigeria's imports (Figure 3 - Nigeria).

### 3.2 Uneven growth impact of the CFTA in Africa

The integration process between African countries through the CFTA would boost economic growth compared to the GDP projections in the baseline. In the long run, a greater openness between these countries would lead to the achievement of greater rates of GDP growth. However, in the short run there would be some economic costs, in particular in the scenario where NTMs in goods and transaction cost are reduced intra-Africa (Figure 4).

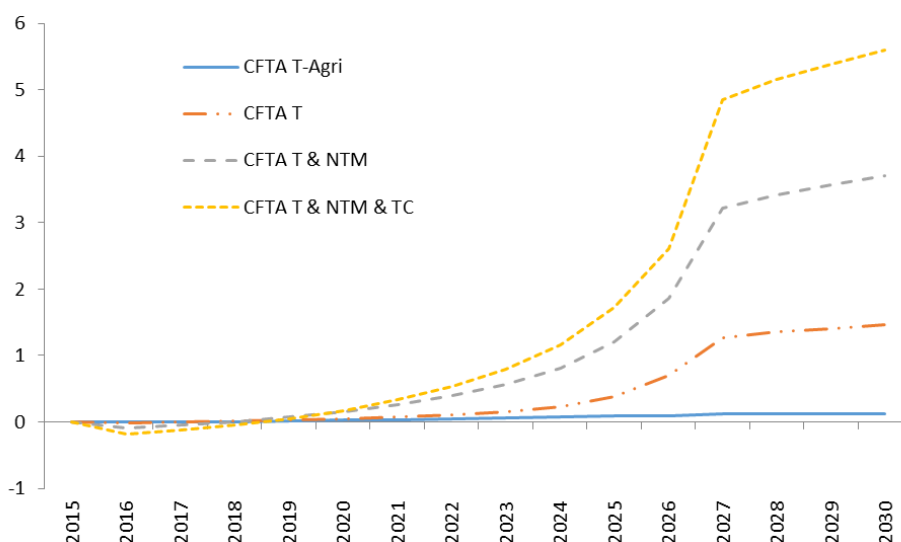


Figure 4: Additional growth in Africa due to the CFTA. % change of GDP (volume) compared to the baseline, 2015-2030

Moreover, the different modalities to implement the CFTA would lead to important dis-

parities across African countries in terms of the economic growth. Figure 5 shows the gains in growth rate for each African country/region by the completion of the agreement under the different scenarios. The elimination of intra-Africa tariffs is not crucial to boost growth in the region, except for the cases of Mozambique and the aggregate Rest of Africa, where the level of tariff protection is very high according to the calibration data. As it was mentioned before for national exports, the reduction in NTMs and trade facilitation (i.e. transaction costs linked to time) are the key drivers for economic growth (except for Madagascar). Countries such as Cote d'Ivoire, Guinea, Senegal, Mozambique, Ghana, Malawi, Tanzania, Rest of Western Africa (Gambia), and the Rest of Africa would benefit at least from an additional 5 per cent point in GDP growth in 2027. Madagascar is the exception because the completion of any of these four modalities of the CFTA would lead to lower growth rates compared with the baseline by 2027.

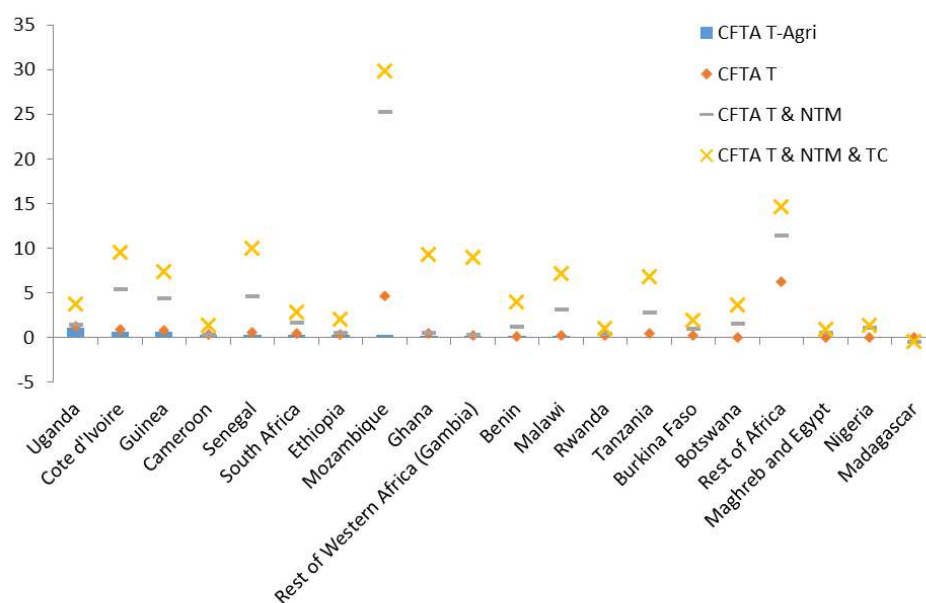


Figure 5: Uneven GDP growth across African countries and CFTA scenarios. *% change of country/region GDP growth compared with the baseline, 2027*

Intra-Africa trade liberalisation will induce a reallocation of resources across and within African countries and sectors. By considering the continent as a single region, the elimination of tariff protection in agricultural goods would incentive the production of vegetable oil and fats, while the production of other agricultural and food product (e.g. other Staple food, Tobacco and Beverages) would increase due to the improvement in trade facilitation. In the particular case of cotton production would be spurred by the reduction in NTMs. Production in Africa would also increase for textile apparel, electronic and electrical goods and furniture, due to the elimination of tariff on manufactures, the reduction in NTMs and transaction costs inside the continent. On the other hand, the CFTA would lead to a reduction in the production of cereals and bread, fruits and vegetables, meats and other non-tradable goods and services such as education and health (Figure 42).

Looking at each particular country, interesting changes in activity patterns can emerge as a



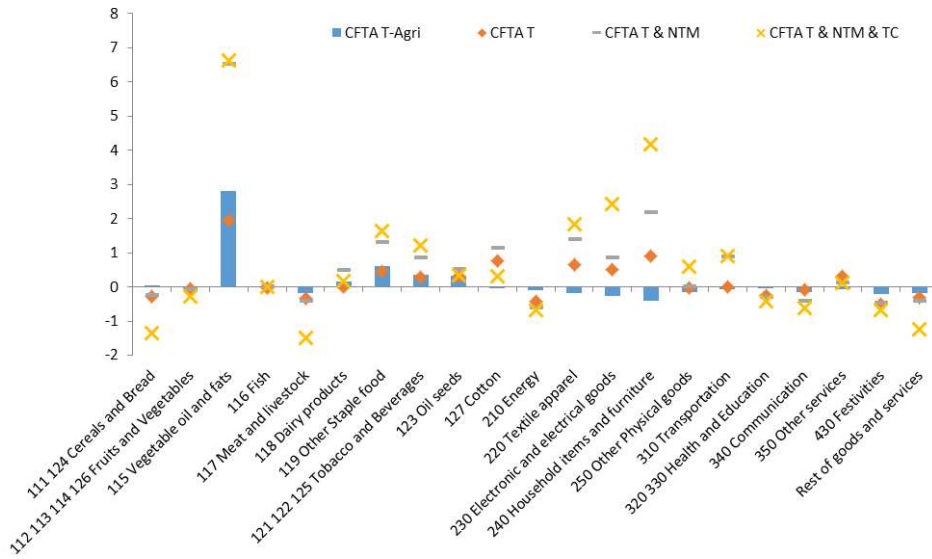


Figure 6: Changes in production pattern in Africa. % variation in production by sector compared with the baseline, 2027

consequence of the CFTA.

Tariff elimination intra-Africa boots Burkina Faso’s production on manufacture more than agrofood. However, this situation reverses when the reduction of NTMs and trade costs increase competition and local manufacturing sectors become negatively affected. Under the last scenario, agrofood, manufacture and other value added increases while services decreases (Table 4 - Burkina Faso).

The intra-Africa tariff elimination on agricultural and primary goods would shift Burkina Faso industrial structure to Vegetable oil and fats, Cotton, Energy, and even to Textile, Electronic and electrical devices and Household items and furniture, which are manufactured goods. This industrial pattern intensifies under the most ambitious CFTA scenario, but reverses particularly for Household items and furniture (Figure 7 - Burkina Faso).

Cameroon’s production would be negatively affected for agrofood and manufactures and energy by a greater competition when the CFTA is implemented under any of the four simulated scenarios. Only services and others would increase under the most ambitious scenarios (Table 4 - Cameroon).

Tariff elimination in agrofood products and energy significantly change Cameroon’s industrial structure. Value-added shift towards Cereals and bread, Household items and furniture, Transportation and Other goods and services, particularly away from Dairy products, Other Staple food, Vegetables and fruits, Vegetable oil and fats, and others (see Figure 7 - Cameroon, blue bars). This pattern also intensifies when NTMs and transaction costs become lower, benefiting more manufacturing sectors and transport than agrofood.

Value added in Cote d’Ivoire increases in agrofood and manufactures sectors under all CFTA scenarios. However, while the largest positive impact for agrofood takes place in the first scenario, the largest impact for manufactures takes place when there is a reduction of NTMs



Figure 7: Reallocation of activities the six SSA under the CFTA scenarios. % variation in value-added of sectors compared with the baseline, 2027.

Table 4: Value-Added of the six SSA countries by sectors under the CFTA scenarios. *% change compared to the baseline in the long (2027) run*

	Sectors	CFTA T-Agri	CFTA T	CFTA T & NTM	CFTA T & NTM & TC
Burkina Faso	Agrofood	0.02	0.04	0.67	0.73
	Manufactures	1.06	0.64	-0.69	0.01
	Others	-1.46	-0.88	0.77	1.24
	Services	-0.11	-0.26	-0.17	-0.17
Cameroon	Agrofood	-0.11	-0.12	-0.5	-0.43
	Manufactures	-0.04	-0.09	-0.69	-0.42
	Others	1.31	1.46	3.15	3.56
	Services	-0.03	-0.02	0.25	0.28
Cote d'Ivoire	Agrofood	2.93	2.06	2.59	1.16
	Manufactures	0.14	2.65	7.44	12.34
	Others	-2.52	-3.22	-5.47	-7.26
	Services	-0.79	-0.8	-1.41	-1.62
Ethiopia	Agrofood	0.31	0.29	0.22	1.68
	Manufactures	-3.66	-3.66	-10.46	-16.82
	Others	1.6	1.71	3.56	3.2
	Services	-0.11	-0.15	0.39	0.56
Madagascar	Agrofood	0.04	0.03	-0.19	-0.21
	Manufactures	0.02	0.04	0.36	0.41
	Others	-0.03	-0.01	-0.14	-0.11
	Services	0	-0.02	0.26	0.3
Nigeria	Agrofood	-0.07	-0.11	-0.14	-0.2
	Manufactures	0.13	0.1	0.47	0.71
	Others	-0.58	-0.58	-0.85	-1.4
	Services	0.08	0.08	0.17	0.24

and particularly of transactions costs linked to time. Services are negatively affected under any of the scenarios considered (Table 4 - Cote d'Ivoire).

In Cote d'Ivoire, tariff elimination compared to the reduction of NTMs and transaction costs lead to different industrial structure, particularly for Dairy products, where SPS harmonisation plays a role, and for Household items and furniture, whose increase in value-added is positively affected by lower transaction costs linked to time (i.e., better transport infrastructure and a lower bureaucratic red tape). For the rest of sectors, there is a value-added shift towards Cereals and bread and Energy away from Electronic and electrical stuffs, Communication and Other goods and services (Figure 7 - Cote d'Ivoire).

While agrofood in Ethiopia benefits from the CFTA, our simulations predict that value added in manufactures would be negatively affected by the CFTA due to increase in competition, particularly when trade facilitation conditions are implemented intra-Africa. Only services (mainly Transport) would slightly increase under the two most ambitious CFTA scenarios (Table 4 - Ethiopia).

In Ethiopia, the implementation of the CFTA (any of the scenarios), reduce the Vegetable oil and fats value-added. The same is true, but with a lower percentage decrease, for Energy. The industrial structure for this country tends to shift towards Meat and livestock, Transportation and Other goods when the most ambitious CFTA scenario is simulated (Figure 7 - Ethiopia).

Value added in Madagascar only increases in manufactures for all liberalisation scenarios. Agrofood value added increases only in the tariff cuts scenario while services value added does when NTMs and transaction costs are reduced. Overall the impacts of the CFTA are very mild in Madagascar (see Table 4 - Madagascar).

The CFTA scenarios that only eliminate agricultural tariffs would increase value added in the Oil seed and Vegetable and fruits sectors. However, when we move to more ambitious CFTA scenarios national resources are reallocated towards Textiles and Electronic and Electrical goods sectors that would see an increase of its value added with respect to the baseline (Figure 7 - Madagascar).

Agrofood production in Nigeria is negatively affected by the CFTA under any of the simulated scenarios considered. Only value added in manufactures and services would be boosted under all economic integration scenarios (Table 4 - Nigeria). As expected, the relative size of the effects of integration for the Nigerian are smaller than for smaller countries that could gain proportionally more from economic integration.

Nigeria's industrial structure would not shift much because of the CFTA. Household items and furniture value added would increase and Vegetable oil and fats would decrease under all scenarios, but particularly under the most ambitious one (Figure 7 - Nigeria).

### **3.3 The greater intra-Africa integration, the larger welfare gains for every African country**

As a result of the CFTA, welfare would increase in all African countries particularly under the modalities of liberalisation that include the reduction in NTMs in goods and in transaction costs linked to time (Table 47). Nevertheless, when agricultural tariff is the only instrument of trade liberalisation, welfare could be reduced in Burkina Faso, Malawi, Mozambique, Rwanda and the Rest of Africa region, both at the mid-term (2021) and at the completion (2027) of the FTA. Nigeria and the Rest of Western Africa (Gambia) would experience a decrease in welfare compared to the baseline but solely in the long run. In the second scenario when all tariffs in goods are eliminated, welfare also falls in Botswana, and intensifies its negative impact in Nigeria, Rwanda and the Rest of Western Africa (Gambia).

The sources of welfare variation are different for each country/region. For instance, if we consider agricultural tariff elimination intra-Africa, in Cote d'Ivoire the improvement in its terms of trade is the main reason of its welfare increase. Conversely, in Malawi terms of trade is the main component that explains its welfare loss. A more efficient use of resources rises in Uganda and Cameroon under this scenario. Capital accumulation gains appear also on many African countries (Cote d'Ivoire, Guinea, and South Africa) but is not the main source of welfare gain in any country/region (see Figure 8, panel (a)).

If tariffs are eliminated between African partners for every kind of goods, terms of trade gains (losses) increase in Benin, Cote d'Ivoire, Ethiopia, Guinea, Senegal, South Africa, Tanzania and Uganda (Gambia and Malawi). Allocation efficiency gains also intensify in some countries, particularly in Tanzania and Uganda, as well as capital accumulations gains in Cote d'Ivoire (see Figure 8, panel (b)).

As it is shown in Table 5, when we add the 50 per cent reduction of NTMs intra-Africa, every African country improves its welfare, being the reduction in NTMs the main source of those gains in Benin, Botswana, Cote d'Ivoire, Guinea, Maghreb and Egypt, Malawi and Nigeria (see Figure 8, panel (c)). Moreover, if we also incorporate the 30 per cent reduction in transaction costs linked to time between African countries, welfare gains not only increase in every country.

Table 5: National welfare changes in the mid-term and at the completion of the CFTA. % changes compared with the baseline, 2021 and 2027.

Region	CFTA T-Agri		CFTA T		CFTA T & NTM		CFTA T & NTM & TC	
	2021	2027	2021	2027	2021	2027	2021	2027
<b>African countries</b>	0.04	0.1	0.07	0.46	0.27	1.66	0.34	2.64
<i>Benin</i>	0.06	0.24	0.21	0.32	0.61	1.68	0.72	3.44
<i>Botswana</i>	0.01	0.01	-0.01	-0.08	0.55	2.34	0.79	4.76
<i>Burkina Faso</i>	-0.01	-0.1	0.04	0.04	0.37	1.57	0.46	2.73
<i>Cameroon</i>	0.06	0.19	0.08	0.22	0.23	0.92	0.29	1.58
<i>Cote d'Ivoire</i>	0.36	1.35	0.46	1.66	1.15	5.46	1.29	7.28
<i>Ethiopia</i>	0.08	0.22	0.09	0.19	0.17	0.45	0.23	1.47
<i>Ghana</i>	0.04	0.1	0.1	0.24	0.4	1.63	0.85	5.4
<i>Guinea</i>	0.14	0.36	0.17	0.37	0.53	2.55	0.6	4.02
<i>Madagascar</i>	0.01	0.01	0.01	0.01	0.05	0.26	0.06	0.4
<i>Maghreb and Egypt</i>	0.01	0.01	0.01	0.03	0.09	0.51	0.11	0.67
<i>Malawi</i>	-0.03	-0.23	-0.04	-0.48	0.8	3.57	1.16	7.13
<i>Mozambique</i>	-0.02	-0.12	0.04	11.3	1.73	23.61	1.83	26.78
<i>Nigeria</i>	0.01	-0.01	0.01	-0.02	0.1	0.44	0.12	0.62
<i>Rest of Africa</i>	0	-0.09	0.09	0.97	0.37	2.97	0.47	4.57
<i>Rest of Western Africa</i>	0	-0.09	-0.04	-0.24	0.24	0.95	0.68	5.72
<i>Rwanda</i>	0	-0.04	0.01	-0.05	0.1	0.42	0.2	1.9
<i>Senegal</i>	0.17	0.38	0.31	0.76	1.06	4.72	1.25	7.1
<i>South Africa</i>	0.11	0.39	0.17	0.55	0.38	1.91	0.45	3.05
<i>Tanzania</i>	0.02	0.04	0.11	0.43	0.38	1.97	0.51	3.75
<i>Uganda</i>	0.21	0.58	0.26	0.7	0.39	1.25	0.51	3.02

In Ghana and Gambia the reduction of trade costs intra-African becomes the main source of welfare gains as exporters (see Figure 8, panel (d)).

The real remunerations of production factors are affected differently across countries and it depends on the degree of trade liberalisation under the CFTA (Figure 9). The changes in specialization would affect relative wages since the demand of the different types of skills vary with that. According to the assumptions of Mirage-e relative wages will absorb any excess of demand or supply of the two types of labours. Panels (d) and (e) from Figure 9 shows the per cent variations of skilled and unskilled labour wages compared with the baseline at the end of the implementation of the CFTA. Trade liberalisation between African countries through tariffs elimination exclusively improves unskilled skilled relative wages in all African countries except in Mozambique and South Africa. However when we add the reduction of NTMs in goods and of transaction costs intra Africa this result is reversed in seven and eight African countries respectively.

The improvement of the purchasing power of capital (Panel (a) in Figure 9) is mainly due to better condition in terms of trade facilitation and the reduction of NTMs. The real remuneration of capital falls in Mozambique while it increases in the rest of African countries. Countries where the real return to capital experience higher increases are Benin, Ghana, Senegal and the Rest of Western Africa (Gambia). Percentage variations in the real return to land are lower than for capital in every African country (Panel (b) in Figure 9) and in particular, it falls in Ghana, Mozambique, Senegal and the rest of Western Africa (Gambia).

The real return to natural resources increase considerably in every country in Africa except in Mozambique where it falls. Purchasing power for the owner of natural resources increases the most in Cote d'Ivoire and South Africa, which are relatively abundant in this production factor (see Panel (c) in Figure 9).

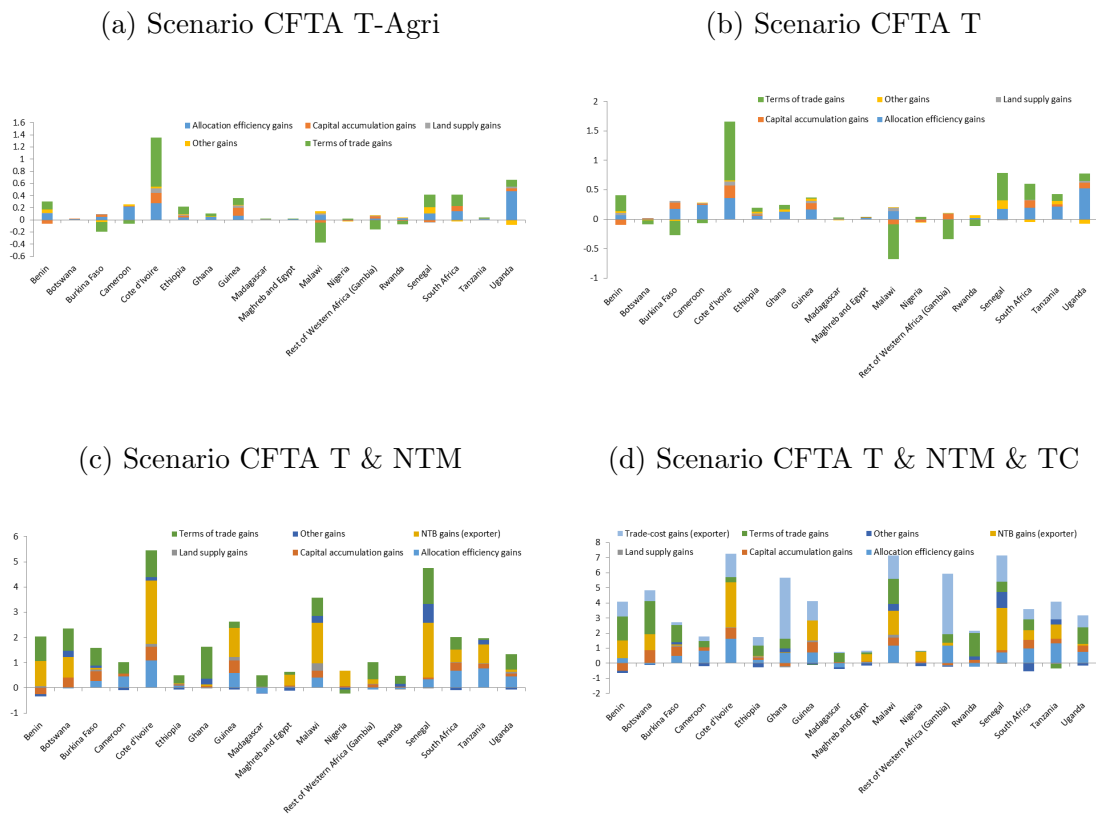


Figure 8: Regional welfare decomposition. % variation in each welfare component compared with the baseline, 2027



Figure 9: Changes in real remuneration to production factors in African countries due to the CFTA. % variations compared with the baseline, 2027.

## 4 Welfare impact of the CFTA at the household level: the results

As first results we report estimates of the density of the log of per capita household expenditure for each of these countries (Figure 1 in Annexes). We show non-parametric estimates for rural and urban areas separately. As expected, the distribution of (log) levels of being is roughly normal in all countries. Moreover, the distribution corresponding to the rural population is always to the right of the distribution of the urban population. This reflects the fact that levels of being are typically higher, on average, in urban than in rural areas.

Then, we turn to the discussion of the welfare effects of CFTA. To streamline the exposition, since we are working with four simulations and two time horizons for each of them, we show two sets of results. We begin report average welfare effects across the entire distribution of income using non-parametric regressions. We then report conditional averages, by quintiles of the income distribution, for rural and urban areas, and for female- versus male-headed households. These results should give a clear indication of the size of the impacts and on their distribution across households with various characteristics.

### 4.1 Negligible short-run welfare effect due to the CFTA

We begin with the average welfare effects across the income distribution in the short-run. All countries show a similar pattern of results. The short-run welfare effects are negative at all income levels for all four simulation scenarios and in all countries. However, the welfare effects, in all four simulations and in all countries, are very small, almost negligible. In fact, we can safely argue that the CFTA will have essentially no welfare effect. Clearly, this is because the price shocks are small to begin with. See the non-parametric regression results in Figure 2 to Figure 7 in Annexes (for Burkina Faso, Cameroon, Cote d'Ivoire, Ethiopia, Madagascar and Nigeria, respectively).

### 4.2 No common welfare pattern change in the long-run due to CFTA

To explore more meaningful results, we focus further on long-run cumulative price effects. The results are reported in Figure 10 to 15. A general result emerges: in the long-run, the welfare effects tend to be positive and sizeable in all four simulations and in all countries. However, the magnitudes and the distributional patterns vary across simulations and countries and we discuss each case separately next.

In Burkina Faso (Figure 10), the positive welfare effects increase in the more comprehensive scenarios. In the scenario CFTA T-Agri (only tariff cuts in agriculture), the welfare effects range from 1.1 at the bottom of the distribution to 0.8 at the bottom. In the case of tariffs on agriculture and manufacturing (scenario CFTA T), the effects range from over 3 percent to around 2 percent. With additional NTM cuts (scenario CFTA T & NTM), the welfare effects increase to 7-8 percent at the left tail of the distribution to around 5 at the right tail. Finally, the largest gains are estimated in scenario CFTA T & NTM & TC. The average welfare effect is around 9-10 percent for the poor and the middle-class but decreases steadily with the level of well-being for the richest households. These results show that, in Burkina Faso, the welfare



effects tend to be pro-poor, in the sense that the average impact is higher for the poorest households *vis-à-vis* the richest households [16].

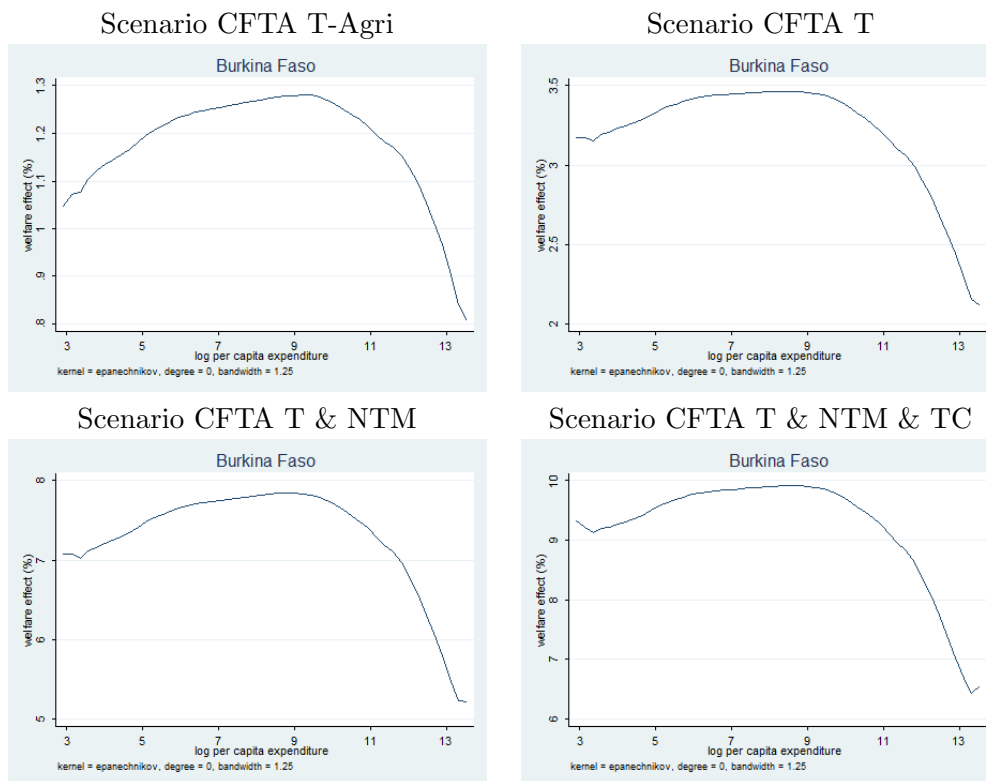


Figure 10: Average Welfare Effects in Burkina Faso Long Run. Note: Average long-run welfare effect (in percent of initial expenditures) across the income distribution.

A different pattern emerges in Cameroon (Figure 11). Here, while there are positive welfare effects in all simulated scenarios, the magnitudes and the distributional impacts are different. Scenario CFTA T-Agri and CFTA T unveil very similar impacts. The poorest household gain about 2 percent, while the richest, about 3.5 percent. The largest welfare effects are estimated in Simulation CFTA T & NTM, where the poor gain from 5 to 7 percent, and the rich gain over 9 percent. It is noteworthy that the impacts in Simulation CFTA T & NTM & TC are actually lower than in Simulation CFTA T & NTM, although they are much higher than in Simulations with tariff eliminations only. Unlike the case of Burkina Faso, the distributional impacts are higher for the rich than for the poor and CFTA appears to have a pro-rich bias in Cameroon.

The results for Cote d'Ivoire (Figure 12) are more erratic. In the tariff cut scenarios (scenario CFTA T-Agri and scenario CFTA T), the welfare effects are positive and show a U-shaped pattern. However, in scenario CFTA T-Agri the richest households gain proportionately more than the poorest households, while in scenario CFTA T, it is the other way around. In scenarios CFTA T & NTM and CFTA T & NTM & TC, the welfare effects are much larger and show a more marked pro-poor bias. For instance, in scenario (iii), the poorest households gain around 9-8 percent, while the richest gain between 5-6 percent. In scenario CFTA T & NTM & TC, the gain for the poorest is near 10-12 percent, while the gain for the richest fluctuates around 6 percent.

In Ethiopia (Figure 13), the welfare effects are large and display a very neat pro-rich bias.

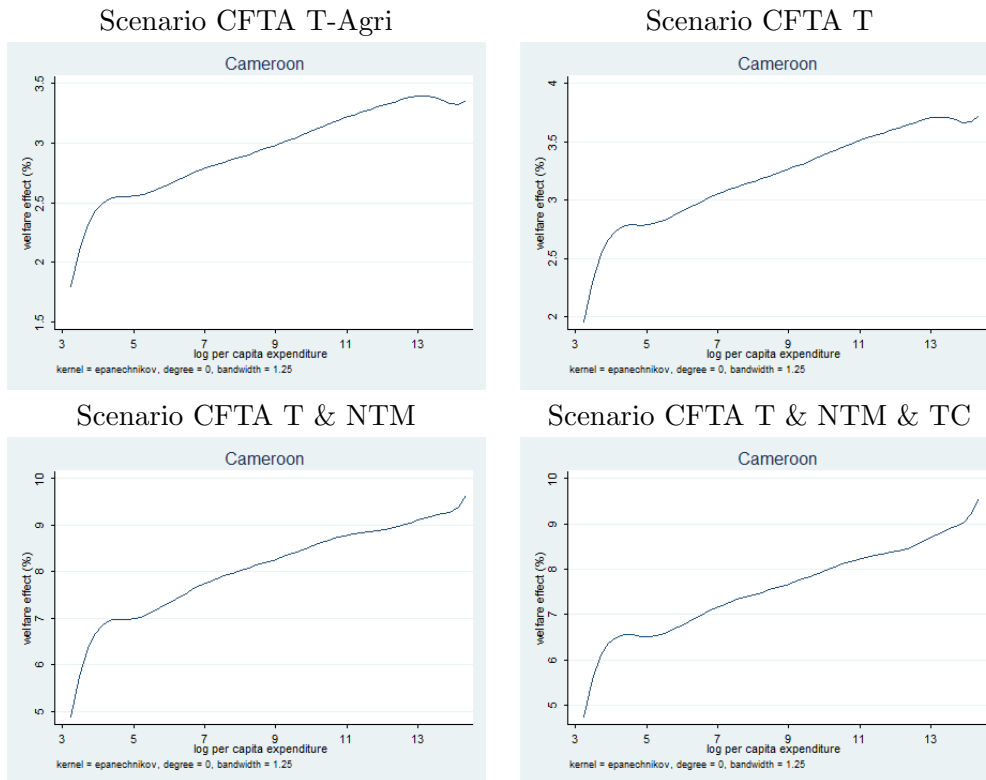


Figure 11: Average Welfare Effects in Cameroon Long Run. Note: Average long-run welfare effect (in percent of initial expenditures) across the income distribution.

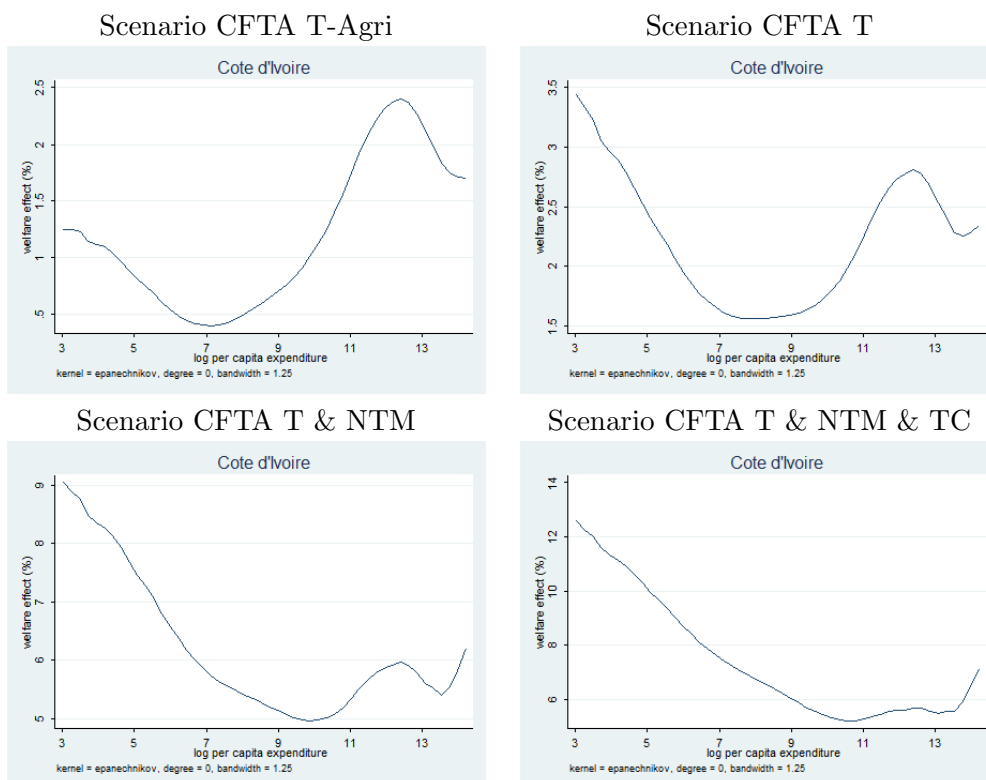


Figure 12: Average Welfare Effects in Cote d'Ivoire - Long Run. Note: Average long-run welfare effect (in percent of initial expenditures) across the income distribution.

The gains for the poor are of around 1.5 percent in scenario CFTA T-Agri, 2.5 percent in scenario CFTA T, 4.5 percent in scenario CFTA T & NTM and over 8 percent in scenario CFTA T & NTM & TC. For the richest households, the gains are roughly 2.5-3 and 3.5-4 percent in simulations CFTA T-Agri and CFTA T, near 8 percent in scenarios CFTA T & NTM and about 13 percent in scenario CFTA T & NTM & TC. The large differences in welfare effects created by the addition of reductions in transport and transaction costs (scenario CFTA T & NTM & TC) are worth noticing explicitly.

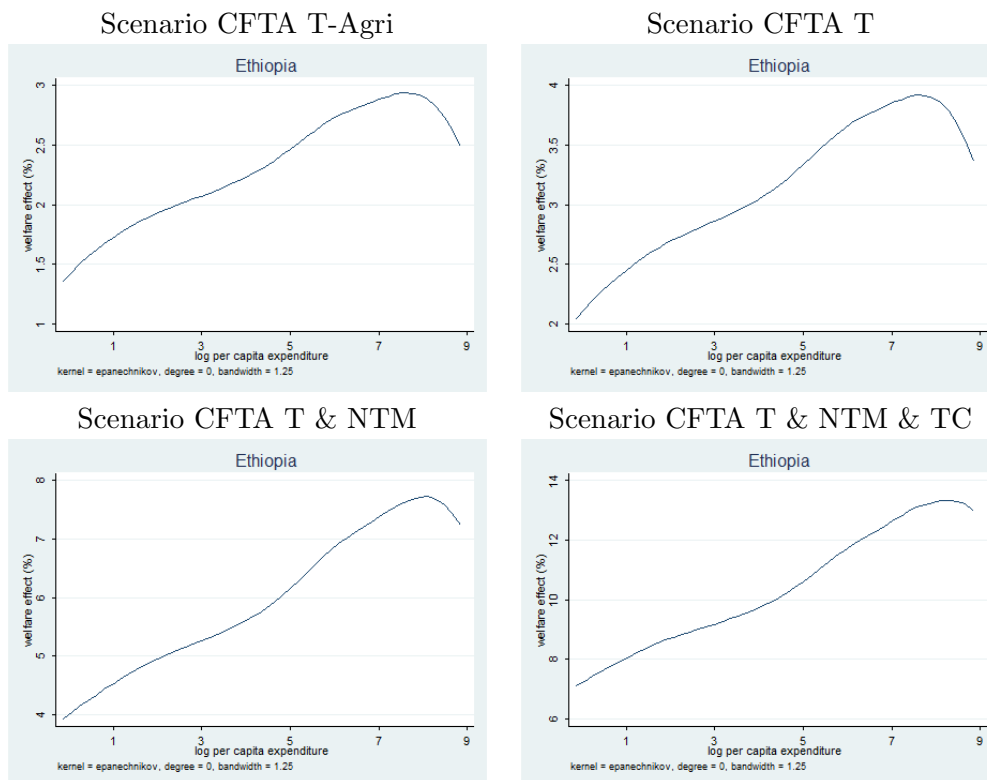


Figure 13: Average Welfare Effects in Ethiopia Long Run. Note: Average long-run welfare effect (in percent of initial expenditures) across the income distribution.

The case of Madagascar (Figure 14) uncovers distinct patterns. First, the magnitudes of the welfare effects, which are once again positive on average always, are significantly lower than in most other cases. In Simulations CFTA T-Agri and CFTA T, the welfare effects range from 0 to 0.15-0.2 percent, respectively. These are almost negligible long-run impacts. Even in the more ambitious scenarios, the welfare effects are modest. In scenario CFTA T & NTM & TC, for instance, the gains range from around 2 percent at the bottom of the distribution, to around 3 percent for the upper-middle class. Note that the non-parametric regressions become noisy at the upper-most right tail of the distribution. This is probably because of the presence of a few outliers in the sample.

Finally, Figure 15 shows the case of Nigeria. As in all the previous cases, the welfare effects are positive. In simulation CFTA T-Agri, the cut of tariffs on agrofood sectors imply a welfare gain of about 1 to 2 percent at the left tail of the income distribution. These gains raise steadily with income until the middle of the distribution and then slightly decrease for the richest households. Similar patterns and magnitudes are observed in scenario CFTA T.

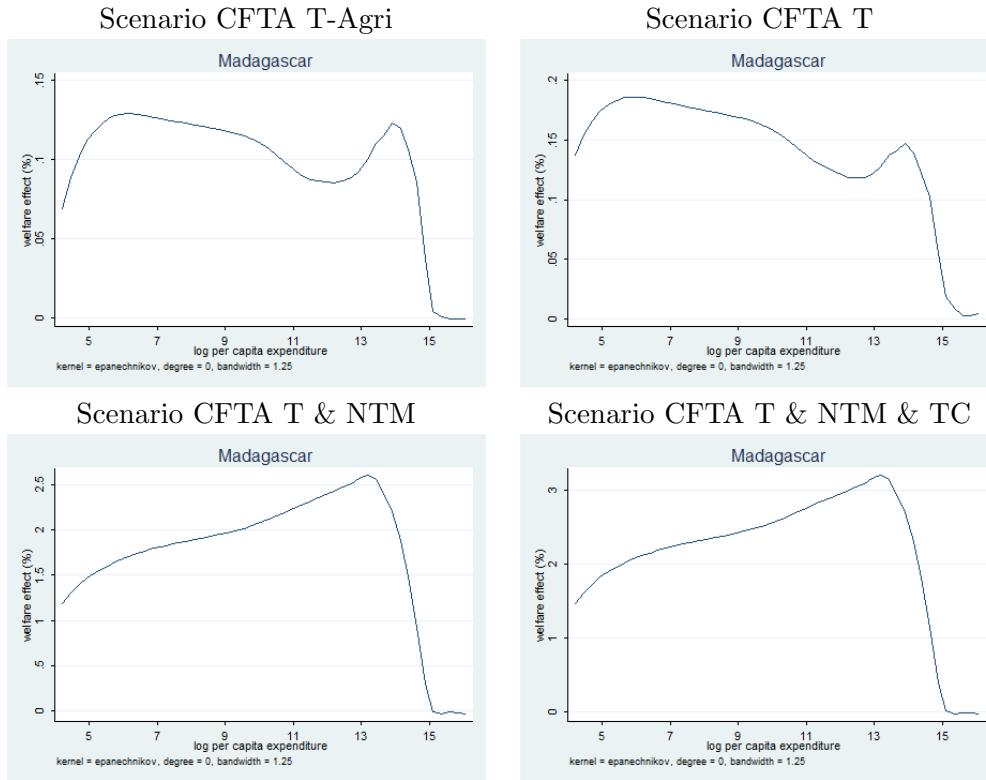


Figure 14: Average Welfare Effects in Madagascar - Long Run. Note: Average long-run welfare effect (in percent of initial expenditures) across the income distribution.

The addition of NTM cuts increases the average welfare effect, on average, for households across the entire income distribution. Further, the elimination of transport costs generates very similar gains, also across the entire income distribution. It should be noted at this moment, that these welfare effects correspond to the price effects estimated in the CGE and not to any direct welfare effect of the reduction in transport costs. This is useful to inform whether CFTA is beneficial or not and whether it is more (or less) beneficial in the presence of lower costs, irrespective of whether reduction is transport and transaction costs are welfare-increasing themselves. In all four simulations, CFTA has a moderate pro-rich bias. The richest households benefit proportionately more than the poorest households, but they benefit a bit less than pure middle-income households.

In Tables 48 to 53 in Annexes, we summarize these results by computing, for each country and each simulation, the average welfare effect at quintiles of the income distribution. In Africa, it is reasonable to argue that the first and second quintile, at least, represent the poor. We also report, in the first column, the unconditional average welfare effect. In Burkina Faso, the average welfare effect in the short run is essentially zero in all scenarios. In the long-run, the average effect ranges from 1.07 percent in scenario CFTA T-Agri to 3.03 in CFTA T, to 6.89 in CFTA T & NTM and 8.96 in CFTA T & NTM & TC (Table 48). In Cameroon, the short run impacts are also negligible, but the average gains in the long run are 2.67 percent, 2.93 percent, 7.46 percent, and 7.00 percent, respectively (Table 49). In Cote d'Ivoire, again, the short-run impacts are zero (Table 50). The long run impacts are 0.83 CFTA T-Agri, 2.23 CFTA T, 7.33 CFTA T & NTM and 9.54 CFTA T & NTM & TC. In Tables 51 to 53, we see that the

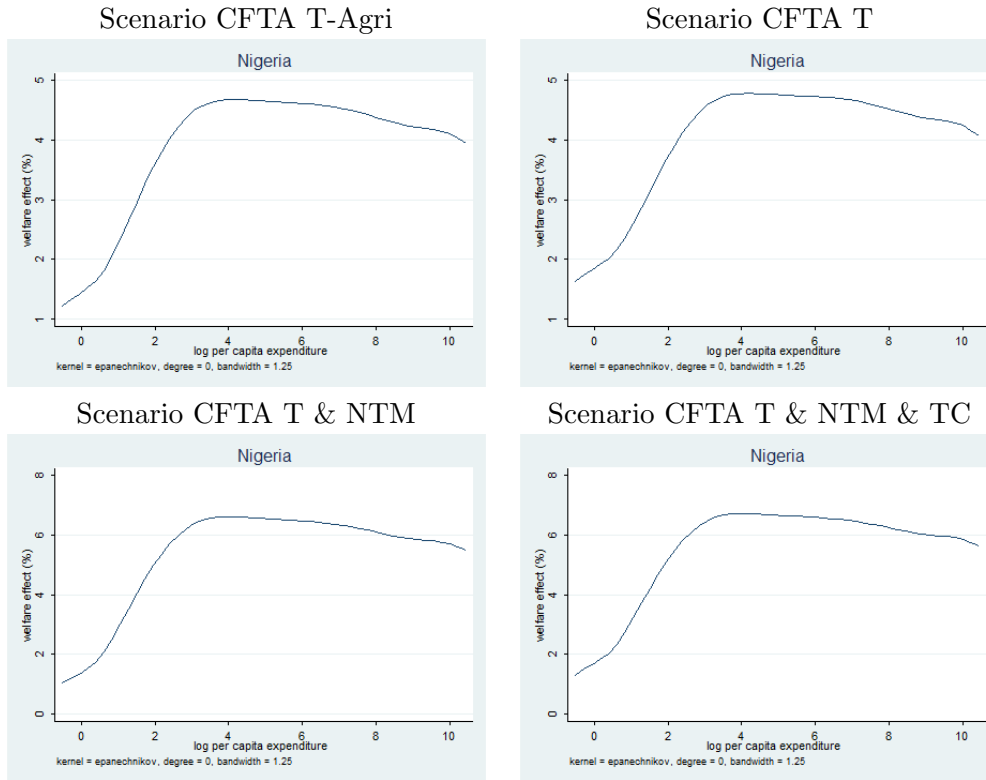


Figure 15: Average Welfare Effects in Nigeria - Long Run. Note: Average long-run welfare effect (in percent of initial expenditures) across the income distribution.

short-run effects are also negligible in Ethiopia, Madagascar, and Nigeria. As in all cases, the long run impacts are sizeable. In Ethiopia, the average gain is 1.63 (in scenario CFTA T-Agri), 2.14 (in scenario CFTA T), 3.69 (in scenario CFTA T & NTM), and 6.73 (in scenario CFTA T & NTM & TC). Madagascar shows smaller impacts across simulations: 0.17 CFTA T-Agri, 0.22 CFTA T, 1.76 CFTA T & NTM, and 2.18 CFTA T & NTM & TC. The impacts are larger, across simulations, in Nigeria: 4.48 CFTA T-Agri, 4.65 CFTA T, 6.20 CFTA T & NTM, and 6.36 CFTA T & NTM & TC.

### 4.3 Other dimensions of welfare impact due to the CFTA: by gender and by region

In Tables in Annexes, we also report average welfare effects for female-headed and male-headed households, as well as for rural and urban households. We only discuss here some regularities corresponding to the long-run effects because the short-run impacts are tiny for all types of households in all countries and in all simulations. In Burkina Faso, both male- and female-headed households win with CFTA but female-headed household benefit much more than male-headed households. In Cameroon, instead, both types of household win and the gains are approximately similar (in percent of initial household welfare). In Cote d'Ivoire, female-headed households actually lose from CFTA in Simulations CFTA T-Agri and CFTA T (while male-headed households always win), but these losses are very small. In Simulations (iii) and (iv), female-headed households win, but much less than male-headed households. In Ethiopia, both types of households benefit from CFTA, with a slight bias in favor of female-headed households

(especially in Simulations CFTA T & NTM and CFTA T & NTM & TC). A similar result emerges in Madagascar, though the magnitudes of the effects for all households are smaller. In Nigeria, it is the only way around: both types of household benefit from CFTA, but the bias is in favor to male-headed households.

In terms of rural vis-a-vis urban households, the gains are larger for urban households in Burkina Faso, Cameroon, Ethiopia, and Madagascar. The gains are instead larger for rural households in Cote d'Ivoire (sometimes by a huge difference, such as in Simulation CFTA T & NTM & TC). In Nigeria, the average impacts are comparable for urban and rural households, being slightly higher for urban households in scenarios CFTA T-Agri and CFTA T, but slightly higher for rural households in scenarios CFTA T & NTM and CFTA T & NTM & TC.

To summarize, we find that 1) the short-run impacts of CFTA in the first year after implementation are generally very, very small; 2) the long-run impacts are instead positive in basically all scenarios and all households. Africa appears to benefit, on average, from the free trade agreement; 3) as the scenarios become more ambitious, the welfare effects of the CFTA grow larger; 4) there is heterogeneity in the welfare effects in a given country and across countries. In some countries, the CFTA is pro-poor, while in others it is pro-rich; in some countries, the CFTA benefits male-headed households proportionately more than female-headed households, while the reverse happens in other countries; in some economies, rural households are benefitted to a larger extent than urban households, while in other economies, urban household benefit instead more. It is important to note that it is in general not possible to trace why this heterogeneity takes place. The analysis combines different scenarios, each one of them covering a complex trade liberalisation setting. Trade policy is set at the Harmonized System line, which can cover from 5 to 8 thousand goods and products. This implies heterogeneity in the price shocks that we study here. Moreover, there is heterogeneity in the household surveys in the patterns of consumption and of income sources. Some poor households can be net producers of a given good (thus for example benefitting from a price increase), while others, also poor households, can be net consumers. In turn, a poor household can be a net consumer of a good and a net producer of another, and this pattern may be totally different for a similar household. The heterogeneity that we think can be productively traced is the heterogeneity exploited in our results, across income levels, and across gender and regional dimensions.

## 5 Final remarks

In this paper we study the trade, growth and welfare effects of a CFTA in Africa. We propose four trade liberalisation scenarios that lead to isolate the consequences of an agricultural products tariffs cut from the an overall tariffs elimination on goods, a reduction by half in the NTMs for goods and lastly, a reduction in 30 percent of transaction costs associated with time. Other scenarios, such as trade liberalisation in services between African countries, and the implementation of a Common External Tariff (CET) assuming a further deepening of the integration process in Africa. Nevertheless, these additional scenarios do not seem likely in the near future because require extra arrangements (e.g. on the revenue-sharing agreement of a CET) and therefore are not included in our paper.

The different trade liberalisation modalities condition trade, growth and welfare gains for each African country when a CFTA is implemented. Greater gains come from the reduction of NTMs in goods and on the improvement of trade facilitation conditions, and not necessarily from and intra-Africa tariff elimination. Moreover, those gains are unevenly distributed across African countries. Smaller and currently highly protected economies would benefit the most from this economic integration process. However, the current existing disparities in the level of trade protection across countries in Africa and within sectors could make the implementation of the integration agreement challenging. In particular, it may be difficult for countries to converge to a CET if a custom union is later seek among African countries.

The CFTA would also lead to asymmetric changes in trade patterns among African countries and within countries across sectors, which are also sensitive to trade liberalisation modalities. As a general conclusion on the trade impact of the CFTA, it should be noted that intra-Africa trade would intensify between countries which are already trade partners and new trade relations may not emerge significantly. In terms of trade diversion, traditional partners outside Africa (the EU, the US, China, India, the GCC and Brazil) would suffer the negative consequence of the CFTA. In terms of trade by sector, the CFTA will increase exports in those products and services which are currently traded. In some particular countries, exports and imports of energy could significantly increase because of the growth effect of the CFTA.

In terms of growth effects, the CFTA would boost economic growth compared to the GDP projections in the baseline. In the long run, a greater openness between these countries would lead to the achievement of greater rates of GDP growth. However, in the short run there would be some economic costs, in particular in the scenario where NTMs in goods and transaction cost are reduced intra-Africa. The different modalities to implement the CFTA would also lead to important disparities in economic growth rates across African countries. The elimination of intra-Africa tariffs is not crucial to boost growth for most countries in Africa, but the reduction in NTMs and complementary policies that facilitate trade are the key drivers for trade led economic growth for most African countries in the long run.

Finally, we use price and factor remunerations changes from the different liberalisation scenarios in combination with household data for six African countries (Burkina Faso, Cameroon, Cote d'Ivoire, Ethiopia, Madagascar, and Nigeria.) to study the welfare effect of the CFTA at the household level. These microsimulations allow us to study the welfare effects of the CFTA for different demographic groups. We find that the short-run impacts of CFTA are generally very small while the long-run impacts are instead positive in basically all scenarios and all households. Africa appears to benefit, on average, from the CFTA. As the scenarios become more ambitious, the welfare effects of the CFTA grow larger. However, there is heterogeneity in the welfare effects in a given country and across countries. In some countries, the CFTA is pro-poor (e.g., Burkina Faso), while in others it is pro-rich (e.g., Cameroon and Nigeria); in some countries, the CFTA benefits male-headed households proportionately more than female-headed households (in Nigeria), while the reverse happens in other countries (Burkina Faso, Cote d'Ivoire, Ethiopia); in some economies (e.g., Cote d'Ivoire), rural households are benefited to a larger extent than urban households, while in other economies (e.g., Burkina Faso, Cameroon, Ethiopia and Madagascar), urban household benefit instead more. It is important

to note that it is in general not possible in this study to trace why this heterogeneity takes place.

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## **A ANNEXES**

### **A.1 Current trade protection in Africa**

### **A.2 Other Microsimulation Results**

Table 1: Intra-Africa average applied tariffs: selected primary and agricultural products *Simple average applied tariffs in African countries/regions*

	Cotton			Tobacco			Cereals			Energy		
	MIN	Applied Tariff	MAX	MIN	Applied Tariff	MAX	MIN	Applied Tariff	MAX	MIN	Applied Tariff	MAX
Benin	5%	5%	5%	17%	19%	20%	1%	10%	19%	4%	7%	9%
Botswana	0%	0%	0%	0%	0%	0%	0%	12%	23%	0%	0%	1%
Burkina Faso	1%	3%	5%	1%	13%	20%	5%	8%	11%	3%	6%	9%
Cameroon	0%	2%	3%	0%	18%	26%	4%	11%	27%	1%	8%	10%
Cote d'Ivoire	2%	4%	5%	0%	16%	20%	5%	7%	10%	0%	5%	9%
Ethiopia	5%	5%	5%	31%	34%	35%	5%	10%	14%	0%	6%	8%
Ghana	10%	10%	10%	14%	19%	20%	3%	13%	19%	0%	5%	9%
Guinea	5%	5%	5%	20%	20%	20%	2%	11%	20%	5%	14%	17%
Madagascar	1%	4%	5%	0%	8%	20%	2%	7%	10%	1%	1%	1%
Maghreb and Egypt	0%	1%	1%	2%	14%	29%	0%	12%	27%	0%	1%	4%
Malawi	6%	6%	6%	0%	16%	23%	8%	17%	25%	0%	5%	9%
Mozambique	0%	0%	0%	12%	18%	20%	0%	2%	4%	1%	5%	7%
Nigeria	2%	4%	5%	1%	24%	50%	2%	6%	14%	6%	8%	10%
Rest of Africa	0%	4%	12%	0%	16%	35%	0%	6%	24%	0%	5%	17%
Rest of Western Africa (Gambia)	2%	6%	12%	0%	13%	22%	0%	8%	19%	5%	10%	20%
Rwanda	1%	3%	5%	0%	15%	30%	2%	4%	7%	0%	4%	10%
Senegal	3%	4%	5%	1%	17%	20%	3%	8%	14%	0%	6%	9%
South Africa	0%	6%	10%	0%	13%	44%	0%	12%	41%	0%	0%	0%
Tanzania	0%	0%	0%	17%	23%	35%	2%	8%	11%	3%	7%	18%
Uganda	0%	0%	0%	3%	7%	16%	1%	3%	5%	0%	4%	9%

Source: authors' calculation based on calibration data from the Mirage-e CGE model, whose original sources is MacMap-HS6 database [8].

Note: Simple average of tariffs applied by African countries on their own African partners. Tobacco (Beverages and Tobacco products from the GTAP 8.1 database), Cotton (Plant-based fibres according to GTAP 8.1 code), Cereals (Paddy rice, Wheat, Processed rice, Cereals grains nec. and Crops nec. From GTAP 8.1) and Energy (Coal, Oil, Gas production and distribution-, Petroleum and coal products and Electricity from GTAP 8.1) in the table correspond to the sector aggregates used in the CGE model.

Table 2: Intra-Africa average applied tariffs on manufactures *Simple average applied tariffs in African countries/regions*

	Textiles			Electric and Electronic devices			Household items and furniture			Other Physical goods		
	MIN	Applied Tariff	MAX	MIN	Applied Tariff	MAX	MIN	Applied Tariff	MAX	MIN	Applied Tariff	MAX
Benin	1%	15%	20%	5%	11%	20%	4%	9%	14%	1%	12%	19%
Botswana	0%	20%	40%	0%	4%	12%	0%	7%	25%	0%	1%	4%
Burkina Faso	1%	11%	20%	12%	13%	17%	2%	11%	20%	0%	9%	20%
Cameroon	17%	23%	30%	10%	17%	30%	4%	13%	23%	2%	12%	18%
Cote d'Ivoire	0%	12%	19%	5%	10%	18%	2%	8%	16%	0%	9%	20%
Ethiopia	10%	28%	35%	5%	15%	25%	3%	11%	21%	5%	13%	20%
Ghana	3%	13%	20%	1%	8%	12%	5%	11%	19%	1%	13%	20%
Guinea	12%	16%	20%	6%	10%	16%	5%	11%	15%	7%	15%	20%
Madagascar	0%	9%	19%	0%	9%	15%	0%	6%	16%	0%	7%	20%
Maghreb and Egypt	4%	15%	36%	1%	9%	14%	0%	12%	31%	2%	8%	23%
Malawi	1%	15%	24%	0%	12%	25%	1%	10%	29%	0%	9%	26%
Mozambique	2%	13%	18%	7%	10%	13%	1%	8%	18%	0%	6%	7%
Nigeria	4%	13%	18%	0%	8%	20%	2%	11%	22%	1%	9%	16%
Rest of Africa	0%	15%	60%	2%	9%	25%	0%	23%	262%	0%	7%	20%
Rest of Western Africa (Gambia)	7%	15%	20%	6%	11%	17%	2%	10%	20%	0%	9%	20%
Rwanda	0%	21%	29%	0%	9%	30%	0%	18%	30%	0%	16%	30%
Senegal	1%	12%	20%	6%	11%	20%	6%	10%	20%	0%	11%	19%
South Africa	0%	18%	37%	0%	1%	3%	0%	3%	15%	0%	6%	13%
Tanzania	3%	14%	25%	0%	5%	21%	1%	10%	29%	3%	14%	25%
Uganda	0%	20%	36%	0%	9%	25%	1%	16%	38%	2%	9%	25%

Source: authors' calculation based on calibration data from the Mirage-e CGE model, whose original sources is MAcMap-HS6 database [8].

Note: Simple average of tariffs applied by African countries on their own African partners. Textiles (Textiles, Wearing apparel and Leather products from the GTAP 8.1 database), Electric and electronic devices (Electronic equipment according to GTAP 8.1 code), Household items and furniture (Wood products, Chemical, rubber and plastic products, Motor vehicles, Manufactures nec. from GTAP 8.1) and Other Physical goods (Paper products and publishing, Mineral products from GTAP 8.1) in the table correspond to the sector aggregates used in the CGE model.

Table 3: Intra-Africa average NTM protection: selected products *Simple average ad-valorem equivalent (AVE) of NTMs in African countries/regions*

	Cereals			Vegetables and Fruits			Household items and furniture			Electric and Electronic devices		
	MIN	AVE NTM	MAX	MIN	AVE NTM	MAX	MIN	AVE NTM	MAX	MIN	AVE NTM	MAX
Benin	7%	40%	80%	2%	48%	112%	0%	18%	48%	0%	46%	117%
Botswana	10%	23%	44%	12%	52%	85%	0%	19%	50%	6%	33%	48%
Burkina Faso	0%	33%	85%	6%	22%	38%	0%	25%	55%	0%	39%	108%
Cameroon	0%	32%	57%	8%	63%	215%	0%	29%	69%	9%	73%	105%
Cote d'Ivoire	0%	36%	64%	0%	33%	75%	0%	16%	37%	5%	73%	125%
Ethiopia	2%	28%	46%	20%	54%	77%	0%	32%	84%	27%	83%	136%
Ghana	0%	44%	63%	2%	37%	91%	0%	23%	43%	0%	59%	115%
Guinea	0%	35%	75%	0%	25%	107%	0%	18%	47%	8%	69%	94%
Madagascar	0%	38%	64%	0%	34%	57%	0%	19%	42%	0%	63%	139%
Maghreb and Egypt	16%	41%	56%	4%	28%	64%	0%	21%	47%	25%	81%	125%
Malawi	0%	42%	66%	12%	45%	73%	0%	23%	50%	17%	76%	121%
Mozambique	1%	28%	64%	12%	69%	148%	0%	17%	42%	18%	55%	85%
Nigeria	0%	42%	88%	21%	38%	61%	0%	15%	47%	17%	65%	99%
Rest of Africa	5%	36%	59%	18%	45%	79%	1%	25%	56%	16%	66%	95%
Rest of Western Africa (Gambia)	3%	40%	58%	5%	47%	82%	0%	20%	49%	20%	84%	121%
Rwanda	0%	42%	83%	5%	48%	93%	0%	21%	53%	0%	86%	130%
South Africa	8%	40%	86%	25%	64%	123%	1%	28%	60%	25%	69%	95%
Senegal	0%	26%	69%	4%	23%	33%	1%	22%	53%	18%	58%	82%
Tanzania	1%	43%	71%	28%	44%	62%	0%	24%	62%	4%	45%	73%
Uganda	5%	40%	74%	10%	48%	90%	0%	22%	44%	14%	68%	86%

Source: authors' calculation based on calibration data from the Mirage-e CGE model, whose original sources is Kee et al. [11, 12, 13] for equivalent ad-valorem from NTMs.

Note: Simple average of ad-valorem equivalent of NTMs applied by African countries on their own African partners. Fruits and Vegetables (Vegetables, fruits and nuts from the GTAP 8.1database), Cereals (Paddy rice, Wheat, Processed rice, Cereals grains nec. and Crops nec. From GTAP 8.1), Electric and electronic devices (Electronic equipment according to GTAP 8.1 code) and Household items and furniture (Wood products, Chemical, rubber and plastic products, Motor vehicles, Manufactures nec. from GTAP 8.1) in the table correspond to the sector aggregates used in the CGE model.

Table 4: Transaction costs between African partners *Simple average (over sector) of transaction costs linked to time between African countries*

	Benin	Botswana	Burkina Faso	Cameroon	Cote d'Ivoire	Ethiopia	Ghana	Guinea	Madagascar	Maghreb and Egypt	Malawi	Mozambique	Nigeria	Rwanda	South Africa	Senegal	Tanzania	Uganda
Benin		18%	32%	24%	29%	19%	61%	34%	11%	12%	22%	12%	29%	34%	17%	13%	16%	28%
Botswana	15%		22%	29%	17%	16%	14%	13%	12%	11%	19%	15%	25%	42%	23%	16%	12%	30%
Burkina Faso	7%	18%		18%	13%	21%	15%	11%	13%	16%	21%	13%	23%	37%	20%	26%	17%	32%
Cameroon	25%	21%	30%		29%	28%	35%	17%	64%	17%	27%	13%	46%	63%	18%	26%	20%	41%
Cote d'Ivoire	23%	51%	25%	14%		115%	21%	14%	14%	12%	25%	10%	65%	42%	15%	46%	79%	43%
Ethiopia	28%	32%	34%	28%	25%		32%	29%	21%	26%	126%	32%	22%	35%	44%	21%	30%	20%
Ghana	16%	26%	33%	22%	15%			14%	17%	15%	24%	12%	21%	46%	50%	23%	18%	40%
Guinea	11%	18%	17%	17%	17%	16%	19%		9%	8%	17%	11%	19%	30%	11%	11%	15%	23%
Madagascar	9%	15%	21%	14%	15%	19%	15%	9%		9%	16%	12%	21%	27%	18%	10%	11%	23%
Maghreb and Egypt	11%	16%	19%	16%	11%	26%	18%	12%	14%	11%	23%	9%	21%	41%	15%	15%	15%	38%
Malawi	22%	28%	31%	15%	26%	30%	28%	19%	19%	19%		15%	29%	26%	113%	24%	18%	20%
Mozambique	16%	21%	29%	24%	20%	25%	25%	14%	12%	14%	35%		34%	49%	46%	16%	20%	41%
Nigeria	16%	23%	18%	24%	14%	18%	20%	11%	10%	8%	16%	10%		28%	9%	9%	14%	25%
Rwanda	24%	29%	31%	27%	24%	29%	27%	22%	21%	21%	25%	23%	34%		23%	25%	32%	33%
South Africa	11%	20%	20%	18%	19%	21%	17%	12%	11%	10%	28%	8%	22%	19%		28%	15%	25%
Senegal	17%	18%	28%	18%	38%	20%	19%	16%	16%	9%	27%	15%	36%	39%	32%		19%	39%
Tanzania	12%	36%	21%	18%	15%	23%	18%	11%	7%	11%	19%	12%	24%	29%	49%	15%		32%
Uganda	22%	37%	29%	24%	28%	20%	19%	19%	17%	15%	30%	22%	32%	50%	32%	20%	33%	

Source: authors' calculation based on calibration data from the Mirage-e CGE model, whose original sources is Minor and Tsigas (2008).

Note: Simple average of transaction costs are calculated over all sectors in the CGE model and for bilateral relations between African countries.

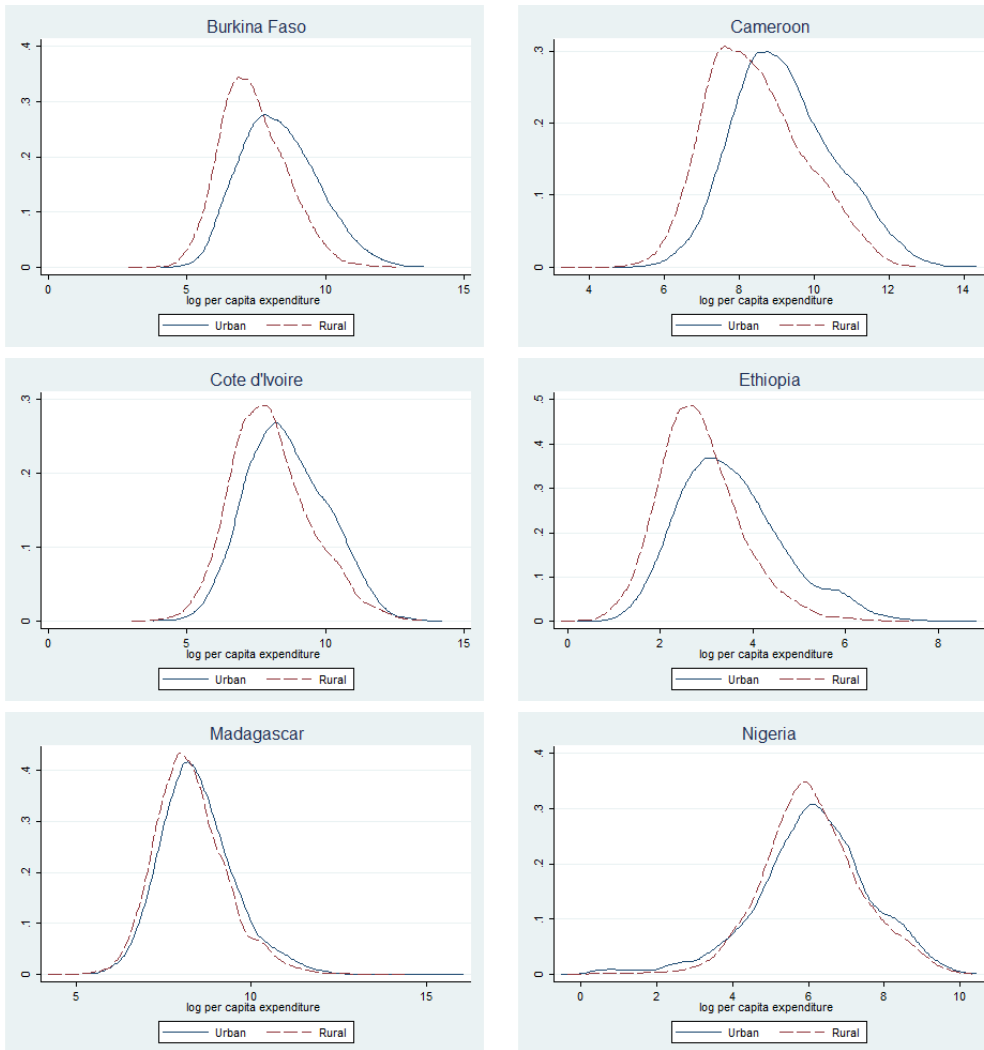


Figure 1: Distribution of Income in SSA. Note: non-parametric density estimation of the log per capita household expenditure for urban and rural areas. The data come from the household surveys.

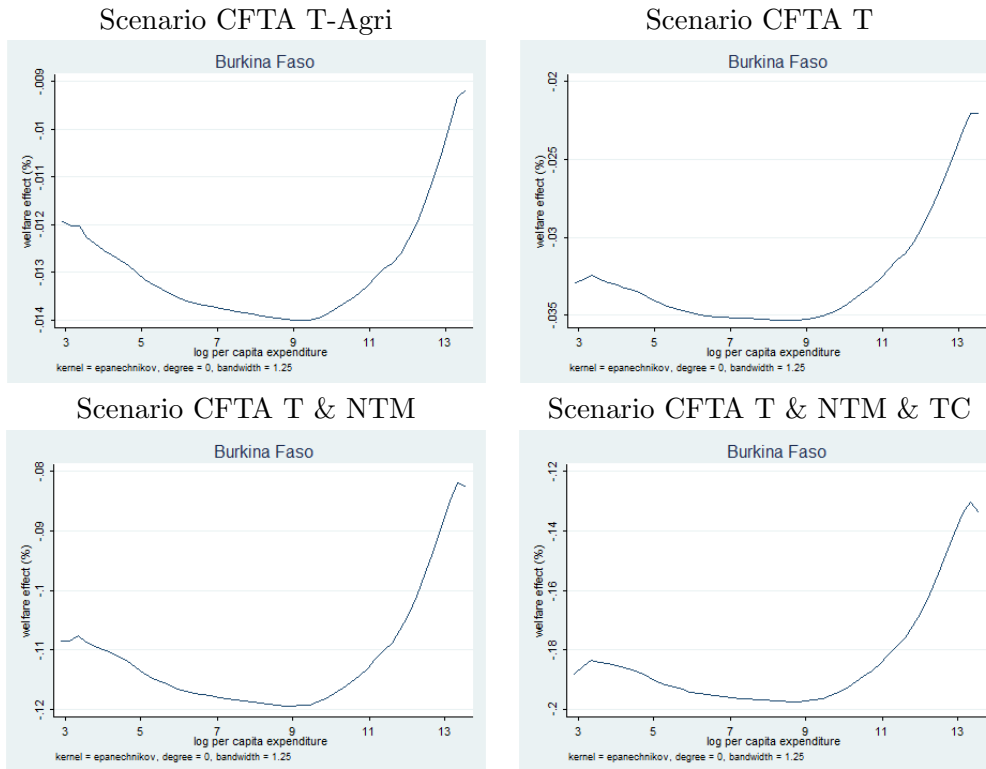


Figure 2: Average Welfare Effects in Burkina Faso - Short Run. Note: Average short-run welfare effect (in percent of initial expenditures) across the income distribution.

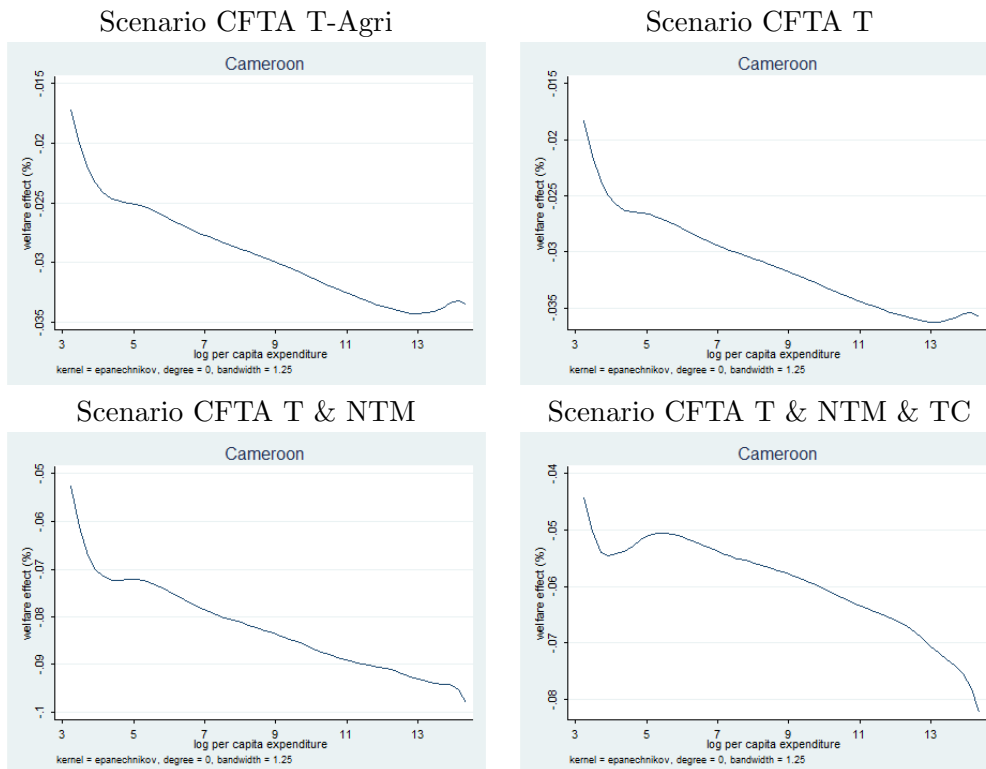


Figure 3: Average Welfare Effects in Cameroon - Short Run. Note: Average short-run welfare effect (in percent of initial expenditures) across the income distribution.

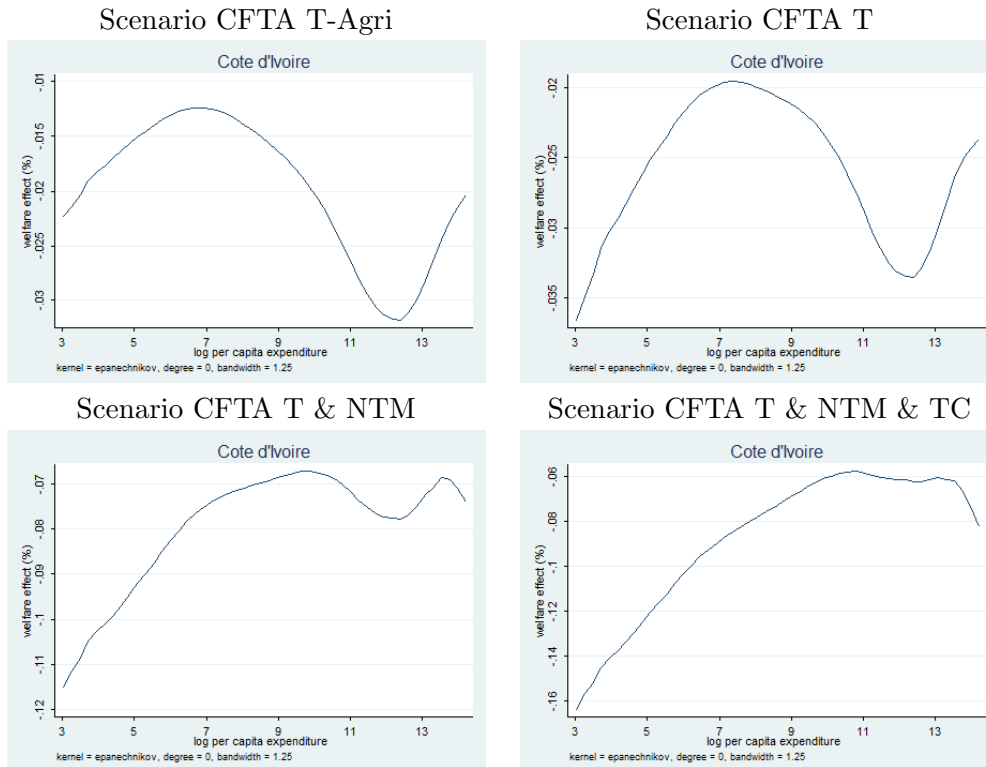


Figure 4: Average Welfare Effects in Cote d'Ivoire - Short Run. Note: Average short-run welfare effect (in percent of initial expenditures) across the income distribution.

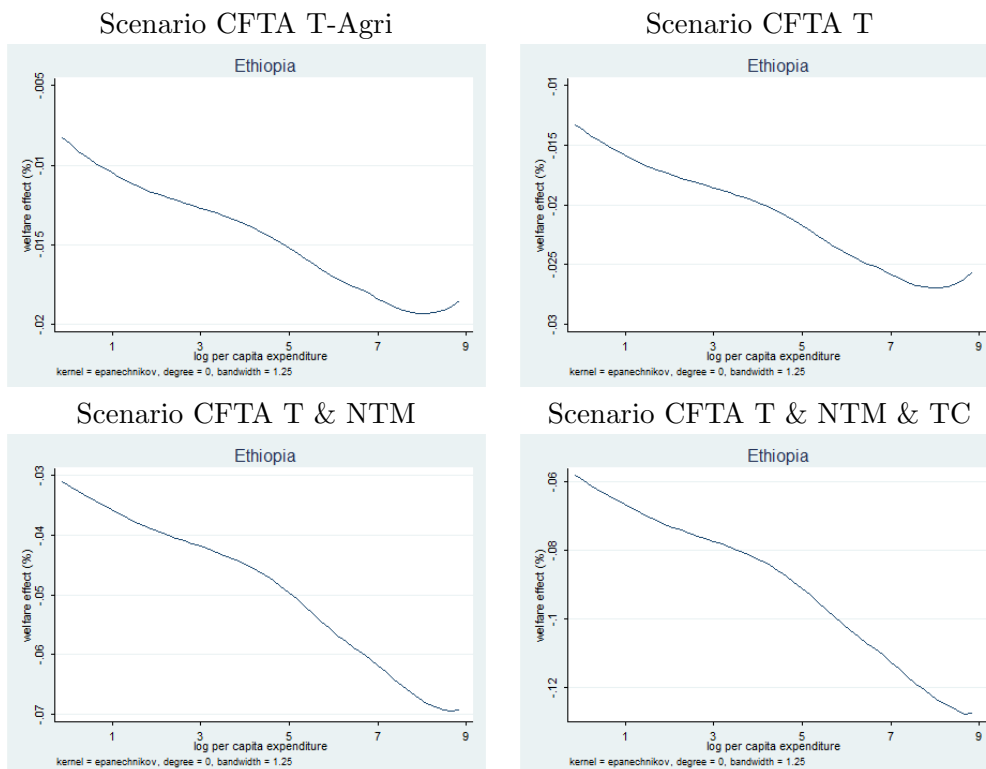


Figure 5: Average Welfare Effects in Ethiopia - Short Run. Note: Average short-run welfare effect (in percent of initial expenditures) across the income distribution.



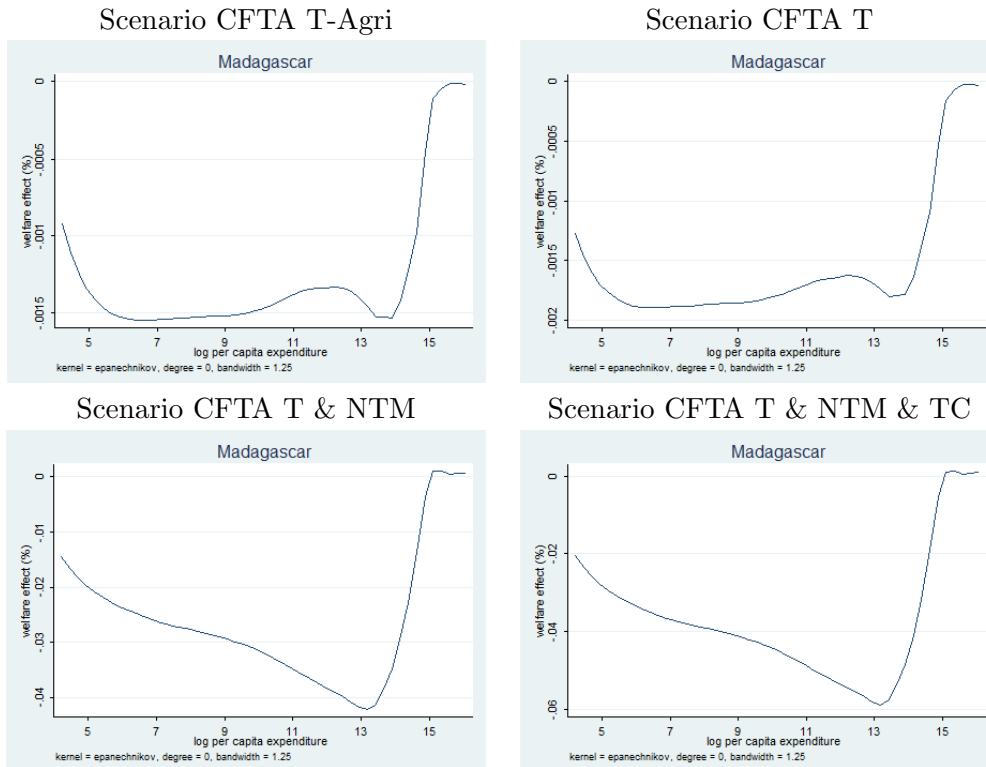


Figure 6: Average Welfare Effects in Madagascar - Short Run. Note: Average short-run welfare effect (in percent of initial expenditures) across the income distribution.

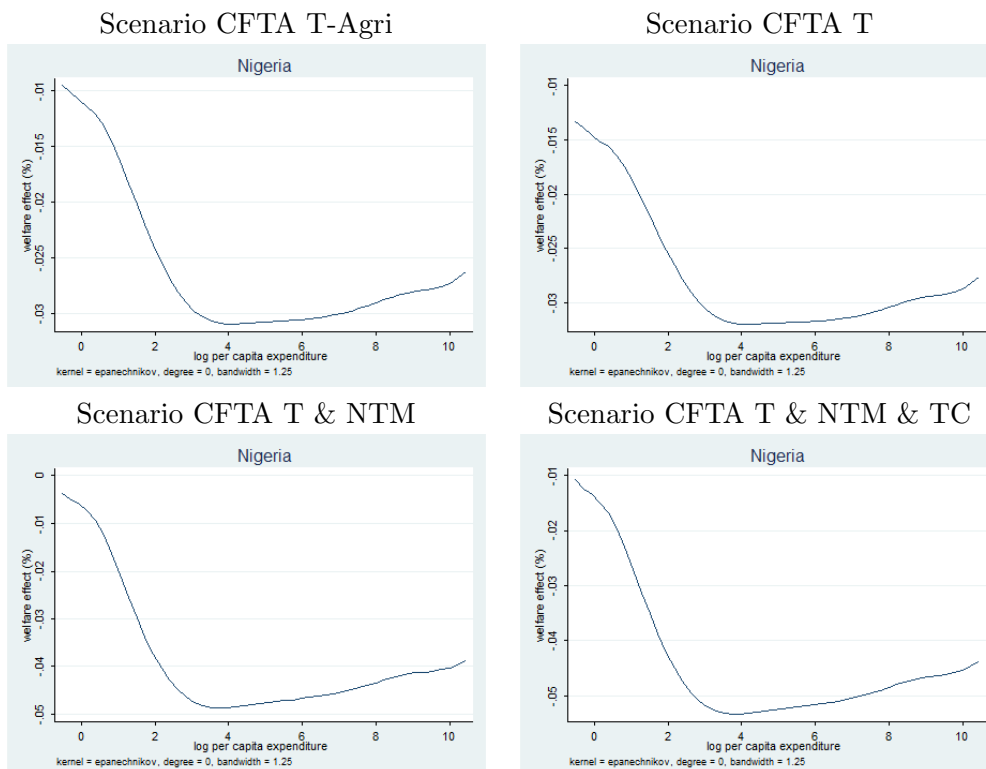


Figure 7: Average Welfare Effects in Nigeria - Short Run. Note: Average short-run welfare effect (in percent of initial expenditures) across the income distribution.

Table 48  
Average Welfare Effects  
Burkina Faso

	Quintile					Male- Headed	Female- Headed	Rural	Urban	
	1	2	3	4	5					
Simulation 1										
Short-Run	-0,01	-0,01	-0,01	-0,01	-0,01	-0,01	-0,02	-0,01	-0,02	
Long-Run	1,07	1,01	1,11	1,04	1,15	1,03	2,08	0,79	2,26	
Simulation 2										
Short-Run	-0,03	-0,03	-0,03	-0,03	-0,03	-0,03	-0,05	-0,03	-0,05	
Long-Run	3,03	2,96	3,13	2,96	3,21	2,88	5,22	2,46	5,48	
Simulation 3										
Short-Run	-0,11	-0,10	-0,11	-0,10	-0,11	-0,10	-0,16	-0,09	-0,18	
Long-Run	6,89	6,64	7,05	6,76	7,29	6,70	11,34	5,71	12,01	
Simulation 4										
Short-Run	-0,18	-0,18	-0,18	-0,18	-0,19	-0,18	-0,26	-0,16	-0,26	
Long-Run	8,96	8,68	9,09	8,85	9,46	8,73	13,47	7,83	13,90	

Note. Average welfare effects computed from simulated price changes and household survey data. Simulations 1: tariff cuts in agrofood sectors. Simulation 2: tariff cuts in agrofood and manufacturing. Simulation 3: adds 50 percent cut in NTM.

Simulation 4: adds 30 percent reduction in transport and transaction costs.

Short-run: effects of CFTA during first year after implementation; Long-run: cumulate long-run effect of CFTA.

Table 49  
Average Welfare Effects  
Cameroon

	Quintile					Male- Headed	Female- Headed	Rural	Urban
	1	2	3	4	5				
Simulation 1									
Short-Run	-0,03	-0,02	-0,02	-0,03	-0,03	-0,03	-0,03	-0,02	-0,03
Long-Run	2,67	2,44	2,33	2,64	2,90	3,06	2,68	2,20	3,30
Simulation 2									
Short-Run	-0,03	-0,03	-0,02	-0,03	-0,03	-0,03	-0,03	-0,02	-0,04
Long-Run	2,93	2,66	2,54	2,88	3,19	3,37	2,94	2,39	3,64
Simulation 3									
Short-Run	-0,08	-0,07	-0,07	-0,07	-0,08	-0,09	-0,08	-0,07	-0,10
Long-Run	7,46	6,64	6,45	7,33	8,23	8,64	7,53	5,94	9,47
Simulation 4									
Short-Run	-0,06	-0,05	-0,05	-0,05	-0,06	-0,06	-0,06	-0,04	-0,05
Long-Run	7,00	6,28	5,96	6,79	7,75	8,21	7,13	5,56	8,91

Note. Average welfare effects computed from simulated price changes and household survey data. Simulations 1: tariff cuts in agrofood sectors. Simulation 2: tariff cuts in agrofood and manufacturing. Simulation 3: adds 50 percent cut in NTM.

Simulation 4: adds 30 percent reduction in transport and transaction costs.

Short-run: effects of CFTA during first year after implementation; Long-run: cumulate long-run effect of CFTA.

Table 50  
Average Welfare Effects  
Cote d'Ivoire

	Quintile					Male- Headed	Female- Headed	Rural	Urban
	1	2	3	4	5				
Simulation 1									
Short-Run	-0,01	-0,02	-0,02	-0,01	-0,01	-0,02	0,00	-0,02	-0,01
Long-Run	0,83	1,74	1,00	0,40	0,10	0,90	-0,99	1,76	-0,18
Simulation 2									
Short-Run	-0,02	-0,03	-0,03	-0,02	-0,02	-0,02	-0,01	-0,03	-0,01
Long-Run	2,23	3,69	2,68	1,75	1,24	1,79	-0,05	3,55	0,80
Simulation 3									
Short-Run	-0,09	-0,12	-0,10	-0,08	-0,07	-0,08	-0,04	-0,12	-0,06
Long-Run	7,33	10,17	8,49	6,55	5,46	5,96	2,84	9,90	4,55
Simulation 4									
Short-Run	-0,11	-0,16	-0,13	-0,10	-0,09	-0,08	-0,04	-0,16	-0,07
Long-Run	9,54	13,44	11,25	8,66	7,17	7,15	3,77	13,00	5,83

Note. Average welfare effects computed from simulated price changes and household survey data. Simulations 1: tariff cuts in agrofood sectors. Simulation 2: tariff cuts in agrofood and manufacturing. Simulation 3: adds 50 percent cut in NTM.

Simulation 4: adds 30 percent reduction in transport and transaction costs.

Short-run: effects of CFTA during first year after implementation; Long-run: cumulate long-run effect of CFTA.

Table 51  
Average Welfare Effects  
Ethiopia

	Quintile					Male- Headed	Female- Headed	Rural	Urban	
	1	2	3	4	5					
Simulation 1										
Short-Run	-0,01	-0,01	-0,01	-0,01	-0,01	-0,02	-0,01	-0,01	-0,01	-0,02
Long-Run	1,63	1,03	1,38	1,64	1,81	2,27	1,57	1,83	1,24	2,82
Simulation 2										
Short-Run	-0,01	-0,01	-0,01	-0,01	-0,02	-0,02	-0,01	-0,02	-0,01	-0,03
Long-Run	2,14	1,57	1,82	2,10	2,31	2,91	2,03	2,56	1,50	4,15
Simulation 3										
Short-Run	-0,03	-0,02	-0,03	-0,03	-0,03	-0,04	-0,03	-0,04	-0,02	-0,07
Long-Run	3,69	2,99	3,06	3,45	3,83	5,14	3,43	4,67	2,19	8,35
Simulation 4										
Short-Run	-0,06	-0,05	-0,05	-0,06	-0,06	-0,08	-0,06	-0,07	-0,04	-0,12
Long-Run	6,73	5,53	5,61	6,39	7,01	9,14	6,26	8,52	4,25	14,41

Note. Average welfare effects computed from simulated price changes and household survey data. Simulations 1: tariff cuts in agrofood sectors. Simulation 2: tariff cuts in agrofood and manufacturing. Simulation 3: adds 50 percent cut in NTM.

Simulation 4: adds 30 percent reduction in transport and transaction costs.

Short-run: effects of CFTA during first year after implementation; Long-run: cumulate long-run effect of CFTA.

Table 52  
Average Welfare Effects  
Madagascar

	Quintile					Male- Headed	Female- Headed	Rural	Urban
	1	2	3	4	5				
Simulation 1									
Short-Run	-0,002	-0,002	-0,002	-0,002	-0,002	-0,002	-0,002	-0,002	-0,002
Long-Run	0,17	0,16	0,17	0,19	0,17	0,14	0,17	0,12	0,18
Simulation 2									
Short-Run	-0,002	-0,002	-0,002	-0,002	-0,002	-0,002	-0,002	-0,002	-0,002
Long-Run	0,22	0,23	0,23	0,24	0,22	0,19	0,23	0,16	0,24
Simulation 3									
Short-Run	-0,02	-0,02	-0,02	-0,02	-0,03	-0,03	-0,02	-0,03	-0,02
Long-Run	1,76	1,28	1,66	1,76	1,91	2,18	1,70	2,13	1,30
Simulation 4									
Short-Run	-0,04	-0,02	-0,03	-0,04	-0,04	-0,05	-0,03	-0,05	-0,02
Long-Run	2,18	1,60	2,04	2,18	2,37	2,70	2,10	2,61	1,62

Note. Average welfare effects computed from simulated price changes and household survey data. Simulations 1: tariff cuts in agrofood sectors. Simulation 2: tariff cuts in agrofood and manufacturing. Simulation 3: adds 50 percent cut in NTM.

Simulation 4: adds 30 percent reduction in transport and transaction costs.

Short-run: effects of CFTA during first year after implementation; Long-run: cumulate long-run effect of CFTA.

Table 53  
Average Welfare Effects  
Nigeria

	Quintile					Male- Headed	Female- Headed	Rural	Urban
	1	2	3	4	5				
Simulation 1									
Short-Run	-0,03	-0,03	-0,03	-0,03	-0,03	-0,03	-0,03	-0,03	-0,03
Long-Run	4,48	4,06	4,93	4,97	4,47	4,07	4,54	3,95	4,40
Simulation 2									
Short-Run	-0,03	-0,03	-0,03	-0,03	-0,03	-0,03	-0,03	-0,03	-0,03
Long-Run	4,65	4,18	5,09	5,15	4,67	4,26	4,70	4,18	4,45
Simulation 3									
Short-Run	-0,04	-0,04	-0,05	-0,05	-0,04	-0,04	-0,05	-0,03	-0,05
Long-Run	6,20	5,76	6,83	6,84	6,11	5,59	6,31	5,25	6,37
Simulation 4									
Short-Run	-0,05	-0,05	-0,05	-0,05	-0,05	-0,04	-0,05	-0,04	-0,05
Long-Run	6,36	5,90	6,99	7,01	6,30	5,77	6,47	5,44	6,45

Note. Average welfare effects computed from simulated price changes and household survey data. Simulations 1: tariff cuts in agrofood sectors. Simulation 2: tariff cuts in agrofood and manufacturing. Simulation 3: adds 50 percent cut in NTM.

Simulation 4: adds 30 percent reduction in transport and transaction costs.

Short-run: effects of CFTA during first year after implementation; Long-run: cumulate long-run effect of CFTA.