6. Expected impact of the African Continental Free Trade Area on food security

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Intra-African trade is a highly important component of Africa's agricultural trade. Much of this trade comprises goods such as vegetables, fish, vegetable oils, fruits and diary (which tend to have greater earning potential than other agricultural or food products), as detailed in Chapter 5. Intra-African trade in agricultural machinery and fertilisers is also significant while that in staple foods, such as millet, sorghum and rice, is relatively limited according to official trade flows, though likely higher once small-scale informal trade is taken into account. The effort to establish a continent-wide free trade area in the form of the African Continental Free Trade Area (AfCFTA) is driven by the recognition that a liberalised trade regime across the continent could drive further growth in intra-African trade including informal trade formalisation as tariffs not already covered by regional trade agreements and non-tariff barriers fall.

This is the background against which this chapter estimates the potential impact of the AfCFTA on the agriculture sector by means of a detailed partial equilibrium model using recently available tariff schedules for African countries. The impact is forecast to be relatively small over the short-run timespan that is covered by the modelling approach. Intra-African trade in the sector as a whole is expected to increase by 5.4 per cent, equivalent to $1,015 million annually, in a scenario of full tariff liberalisation under the AfCFTA. These results are modest, but consistent across all tests of the model to parameter sensitivity analyses, and reflect a scenario in which all trade is liberalised, without recourse to product exclusions (in reality some of this trade may be excluded from liberalisation and the impact of the AfCFTA may be limited further).

How to cite this book chapter:

MacLeod, Jamie (2025) 'Expected impact of the African Continental Free Trade Area on food security', in: Luke, David (ed) *How Africa Eats: Trade, Food Security and Climate Risks,* London: LSE Press, pp. 125–157. https://doi.org/10.31389/lsepress.hae.f License: CC-BY-NC 4.0

Why are the results modest? The technical answer is that trade modelling, such as that deployed in this chapter, relies on amplifying existing trade and there is simply not that much existing formal trade between African countries. Intra-African suppliers account for just 16 per cent of Africa's imports of agricultural and food products. Most of that existing trade already flows through Africa's pre-existing free trade arrangements of the regional economic communities (RECs), so the tariffs faced by that trade are also already low, averaging just 2.9 per cent (on an import-weighted basis).

Nevertheless, where the AfCFTA will have most impact, in the immediate term, is on trade in relatively higher unit-value products including fish and seafood, vegetables, preparations of cereals, vegetable oils, fruits and dairy. There are also relatively sizeable opportunities for exports of sugar and coffee. In the upstream part of the value chain, there are important opportunities for exporters of agricultural machinery and fertilisers.

What these results suggest is that, if the AfCFTA is going to substantially boost the agriculture sector and food security in Africa, it needs to go far beyond merely reducing tariffs. This aligns with the results of other modelling assessments, such as those by the World Bank (2020), the IMF (2019), and the ECA (2021). While less detailed or focused on agriculture specifically, those complementary assessments suggest that much of the impact of the AfCFTA will arise only if it can be effectively used as a tool for reducing non-tariff barriers and stimulating investment. Such non-tariff barriers are found to be higher in the agriculture sector than in other sectors on average (UNECA et al. 2019). Yet, unlike reducing tariff barriers, these benefits of the AfCFTA are not automatic and will require much more work to unpeel the layers of non-tariff challenges facing African traders. Chapter 7 identifies and discusses pathways for the AfCFTA to discipline non-tariff barriers, one aspect of this work.

6.1 Assessing the impact of the African Continental Free Trade Area on the agriculture sector

The analysis uses a partial equilibrium modelling approach (a full elaboration of the model is included in Appendix A). Partial equilibrium models specialise in providing detail on one part or sector of the economy over the short to medium term. They can incorporate the latest tariff schedules and trade flows and provide detailed analysis, which makes them suitable for assessing product-specific impacts within the agriculture sector. This also allows the analysis to use the most recently available tariff schedules for African countries and recent trade data. It should nevertheless be considered as best reflecting *short-run* first-order effects, after which general equilibrium effects are likely to be increasingly important.

Examples of partial equilibrium models in the context of the AfCFTA include those by Mulugeta (2020) on Ethiopia, Bayale, Ibrahim and

Atta-Mensah (2022) on Ghana, Fouda Ekobena et al. (2021) on Central Africa, Oyelami (2021) on Nigeria, Seti and Daw (2022) on the South African agricultural sector, Lunenborg and Roberts (2021) on the Economic Community of West African States (ECOWAS) region and Ossadzifo Wonyra and Bayale (2022) on Togo. Like those assessments, this one focuses on the short run and does not account for broader economy-wide linkages that would tend to be more important over a longer time horizon, including linkages between factor incomes and expenditures and broader macroeconomic adjustments, such as changes to the exchange rate, investment rates, or constraints within endowment markets.

The model simulates the response of imports and other variables to changes in the tariff rate. The underlying model assumes imperfect substitution between different import sources (what is known as the Armington assumption). Goods imported from different countries, although similar, are imperfect substitutes (maize from Kenya is an imperfect substitute for maize from Uganda). Within this assumption the representative consumer determines the level of imports of a good through a two-stage process. First, given an import price index, they choose the level of total spending on a 'composite import good' (say, imported maize). The relationship between changes in the import price index and the impact on total imports is determined by a given 'demand elasticity'. Then, within this composite good, they allocate spending among the different sources of the good, depending on the relative price of each source (say, choose more rice from Tanzania and less from Egypt). The extent of the between-source allocative response to a change in the relative price is determined by the 'substitution elasticity'. A full specification of the model is given in Appendix A.

The model is designed to reduce tariffs only on intra-African trade that is not covered by pre-existing free trade arrangements, such as those of the RECs. In other words, Article 19 of the AfCFTA, Conflict and Inconsistency with Regional Arrangements of the Protocol on Trade in Goods, is fully applied, meaning that trade under pre-existing intra-African preferential trade agreements will continue to be governed by those pre-existing arrangements.[1]

6.2 Structure of existing African trade and tariffs

The results of the model are driven primarily by the shape and form of pre-existing tariffs and trade flows. Table 6.1 shows what these are.[2]

To understand the eventual results of the model, it is important to appreciate a differentiation between two types of intra-African trade. The first is intra-African trade in its entirely. This involves both trade *within* pre-existing regional trade arrangements, such as that between Kenya and Uganda within the East African Community (EAC), as well as trade *between* regional arrangements, such as from Kenya in the EAC to Ghana in ECOWAS. The second is the subset of intra-African trade that is not already covered by pre-existing

regional trade agreements. This would concern only the latter, that is, to use our example, trade between Kenya in the EAC and Ghana in ECOWAS.

If we consider intra-African trade *in its entirety*, the average imported-weighted tariffs on intra-African trade are relatively low, at 1.9 per cent, compared to 9 per cent faced by imports from outside the continent. This is because the majority of intra-African trade already flows through pre-existing regional trade arrangements. Kenya (currently) trades much more with its East African neighbours than with African countries further afield, like Ghana.

If we consider instead only intra-African trade that is not already covered by regional trade agreements, tariffs are much higher. The average import-weighted tariff faced by intra-African exports *outside of regional trade agreements* is considerably higher, at 18 per cent for vegetable products and 19 per cent for foodstuffs. These tariffs are substantial and it is this trade that is scheduled to be liberalised by the AfCFTA and which will drive the results of the modelling.

The intra-African tariffs for the Harmonised System (HS) sector headings associated with agriculture are among the highest of the different sector headings. Tariffs on intra-African trade of 'foodstuffs' are the highest.

Those on vegetable products are fourth highest, behind the textiles and apparel and miscellaneous sections. Nevertheless, tariffs are not especially high, on an import-weighted basis, for any of this trade.

Table 6.1 also shows existing trade flows. These are important for the results of the modelling because what such models do is to effectively scale up (or down) existing trade flows, in line with the impact that the model estimates that tariff reforms will have on those flows. The more pre-existing trade there is, the more there is for the model to scale.

What the model cannot do is predict the creation of wholly new trade flows. In the 2017–2019 reference period for the model, total intra-African trade averaged $87 billion a year, while total imports from external suppliers outside the continent amounted to $513 billion. This puts intra-African trade as a share of total African imports at around 14.5 per cent, consistent with other estimates (ECA 2021). Intra-African trade flows in the foodstuffs section amounted to $6.8 billion, while those of vegetable products amounted to $5.2 billion. This means that the intra-African share of trade in these sections is 25 per cent and 11 per cent, respectively. To put that into context, intra-African trade is stronger than for the average across all trade (which was 14.5 per cent) in foodstuffs, and weaker in trade in vegetable products. In the context of the model, this means that there is both ample demand that could be met and replaced by intra-African suppliers but also that scaling up production to meet this demand could prove more difficult for vegetable products.

Table 6.2 narrows down the focus to the different parts of the agriculture value chain (as introduced in Chapters 2 and 3). As a reminder, foods include products like grains, tubers, meats and fish. Agricultural raw materials include cocoa beans, cotton, coffee, spices, wood and rubber. Agricultural inputs are mostly fertilisers and herbicides. Agricultural capital goods

Table 6.1: Tariffs and existing trade flows, by HS section, 2017–2019

	Simple average tariffs (%)	Average import-weighted tariffs (%)†		Existing trade flows (US$bn)	
		Intra-African*	External	Intra-African	External
Animal and animal products	16.7	2.8	13	3.1	13
Vegetable products	14.7	3.1	8	5.2	41
Foodstuffs	25.1	3.8	22	6.8	21
Mineral products	5.4	0.8	2	23.6	71
Chemicals and allied industries	5.6	1.8	6	7.7	47
Plastics/rubbers	10.2	2.6	10	2.8	27
Raw hides, skins, leather and furs	13.1	1.9	22	0.1	2
Wood and wood products	11.1	2.2	10	2.4	16
Textiles and apparel	17.3	3.2	19	2.7	30
Footwear/headgear	20.0	2.9	20	0.5	4
Stone/glass	14.2	1.4	15	7.3	10
Metals	10.4	1.4	11	10.8	42
Machinery/electrical	7.0	2.3	7	6.2	109
Transportation	8.3	2.3	12	6.4	60
Miscellaneous	11.9	3.6	11	1.3	19
TOTAL	**11.6**	**1.9**	**9**	**87**	**513**

Source: Author, based on the Centre d'études prospectives et d'informations internationales's (CEPII) Base pour l'Analyse du Commerce International (Database for the analysis of international trade) (BACI) trade dataset and tariffs reported in the World Trade Organization (WTO) Integrated Database and International Trade Centre (ITC) MAcMap database for the latest available years.
Notes: * If intra-African tariffs seem unusually low, it is because it includes *intra-REC* free trade area (FTA) trade which for the purpose of the model is simulated as being zero, i.e. it will be unaffected by the AfCFTA in accordance with Article 19.
† Average import-weighting is used here as an intuitive and transparent aggregation method but, being endogenous, should not be interpreted as indicative of effective protection. This does not affect the modelling, which is conducted at the HS6 level of disaggregation.

are tractors, agricultural machinery (such as seeders, harvesters and dryers) and agricultural tools.

The agriculture sector faces higher tariffs than other HS sections on average. The average import-weighted tariff on intra-African imports (in their entirety, including both those within and outside regional trade agreements)

Table 6.2: Tariffs and existing trade flows, by segment of the agricultural sector, 2017–2019

	Simple average tariffs (%)	Average import-weighted tariffs (%)		Existing trade flows (US$bn)	
		Intra-African	External	Intra-African	External
All food	17.9	3.3	13	13.5	71
Agricultural raw materials	9.8	3.4	9	2.2	9
Agricultural capital	4.9	1.5	6	1.0	10
Agricultural inputs	2.3	1.0	3	2.1	5
TOTAL		**2.9**	**11**	**19**	**96**

Source: Author, based on the CEPII-BACI trade dataset and tariffs reported in the WTO Integrated Database and ITC MAcMap database for the latest available years.

within the agriculture sector is 2.9 per cent (compared to 1.9 per cent for all imports). As would be expected, given that most tariff schedules aim to support productivity, average tariffs are lower on agricultural inputs and capital goods and higher on final consumption goods.

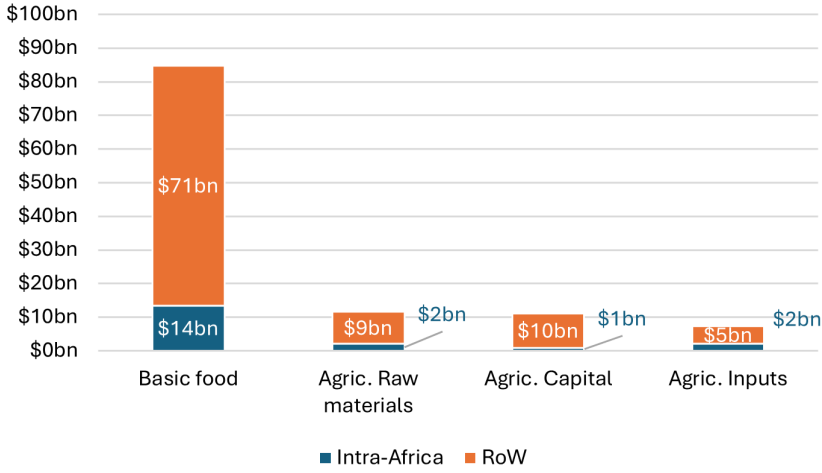
Data on existing trade flows shows that total African import demand is largest for foods. Intra-African imports of foods are 11 times that of intra-African imports of agricultural raw materials. This is the part of the value chain where most value currently exists and where, in the modelling results, we will expect to see the largest nominal potential value in the AfCFTA.

Africa is highly reliant upon capital imported from outside the continent. Intra-African suppliers account for only 9 per cent of all imports of agricultural capital (such as tractors, agricultural machinery and tools) imported by African countries (Figure 6.1). In contrast, 28 per cent of import demand for agricultural inputs, 18 per cent of import demand for agricultural raw materials and 16 per cent of import demand for food is met with intra-African suppliers. By comparing these shares with the average intra-African share in total trade, which as mentioned above was 14.5 per cent, we determine that African countries trade more among themselves in agricultural goods than in other products.

Table 6.3 provides further disaggregation by the main products traded under each part of the agriculture value chain. Cells are shaded in green or blue according to their relative values.

The AfCFTA will have the greatest effect where it will be reducing high tariffs on intra-African trade, where there exists some intra-African trade to scale up, and where there is ample external trade to substitute away from. We can already identify where the AfCFTA is likely to have most impact. This

Figure 6.1: Africa's agricultural trade by source (US$ billion, current prices), 2017–2019



Source: Author, based on the CEPII-BACI trade dataset and tariffs reported in the WTO Integrated Database and ITC MAcMap database for the latest available years.

includes products with relatively high existing intra-African tariffs *and* existing intra-African trade flows. Prime examples are fish and seafood, vegetables, sugar, coffee and fruits.

We can also identify where intra-African trade is unlikely to be substantially affected by the tariff reductions under the AfCFTA. This is the case with products where either tariffs on intra-African trade are already very low or existing intra-African trade is too small to be substantially scaled up. For instance, wheat is one of the most important imports yet intra-African trade is very small, despite low prevailing intra-African tariffs. Tariff reductions under the AfCFTA are unlikely, in themselves, to remedy such circumstances. Similarly, tariffs are already low (on average) on intra-African trade in millet, soya beans, animal food and fodder, tea, agricultural capital and inputs.[3]

The key points of this section are threefold. First, average import-weighted tariffs on intra-African trade are low because most of this trade is already covered by Africa's pre-existing regional free trade arrangements (such as those of the EAC or ECOWAS). Second, within the agriculture value chain section, tariffs are highest on final consumption goods, including fish and seafood, vegetables, sugar, coffee and fruits. We will expect the AfCFTA to have the strongest impact on these products. Third, Africa is also, in general, highly dependent on imports from outside the continent of food security crops like wheat and maize. Low prevailing tariffs on these products suggest that tariff reductions under the AfCFTA will have little impact, however, on boosting intra-African trade in these products.

Table 6.3: Tariffs and existing trade flows, by segment of the agricultural sector, 2017–2019

		Average import-weighted tariffs (%)		Existing trade flows (US$bn)	
		Intra-African	External	Intra-African	External
All food	Vegetables	2.9	17	0.7	3
	Wheat	2.6	6	0.4	15
	Beef	1.3	13	0.2	2
	Dairy	1.7	9	0.5	4
	Fish and seafood	6.4	12	1.9	4
	Fruits	6.6	27	0.8	1
	Maize	3.1	4	0.5	4
	Millet	1.0	9	0.01	0.04
	Palm oil	1.0	14	0.6	5
	Preparations of cereals	3.4	15	0.7	3
	Sorghum	0.9	7	0.1	0.1
	Soya beans	0.1	2	0.03	1
	Vegetable oils	2.5	9	0.5	3
	Beverages	2.6	63	0.9	2
	Sugar	3.1	17	1.4	5
	Citrus fruit	6.8	20	0.1	0
	Tobacco	4.3	19	1.0	2
	Nuts	5.9	21	0.0	0
	Poultry	1.7	25	0.2	2
	Rice	0.2	8	0.3	6
	Other food	1.8	16	2.7	9
	All foods	**3.3**	**13**	**13.5**	**71**
Agricultural raw materials	Coffee	10.0	13	0.3	1
	Tea	0.7	9	0.4	1
	Cocoa	5.9	18	0.2	1
	Wood	1.1	4	0.4	3
	Flowers	6.6	24	0	0
	Fibres	4.2	12	0.2	3
	Cotton	0.2	1	0.2	0

(Continued)

Table 6.3: (Continued)

		Average import-weighted tariffs (%)		Existing trade flows (US$bn)	
		Intra-African	External	Intra-African	External
Agricultural raw materials	Other agricultural raw materials	3.4	7	0.5	2
	All agricultural raw materials	**3.4**	**9**	**2.2**	**9**
Agricultural capital	Machinery	1.8	5	0.7	7
	Tools	0.3	12	0.01	0.1
	Tractors	0.5	9	0.2	3
	All agricultural capital	**1.5**	**6**	**1.0**	**10**
Agricultural inputs	Fertilisers	1.0	2	1.8	3
	Insecticides	1.3	5	0.3	2
	All agricultural inputs	**1.0**	**3**	**2.1**	**5**
	TOTAL	**2.9**	**11**	**19**	**96**

Source: Author, based on the CEPII-BACI trade dataset and tariffs reported in the WTO Integrated Database and ITC MAcMap database for the latest available years.
Notes: Table is shaded with darker cells showing larger values. Green denotes cells relating to intra-African trade and blue denotes cells relating to imports from outside the continent.

6.3 Impact of the African Continental Free Trade Area

Aggregate results are presented in Table 6.4 for all HS section headings. The AfCFTA is estimated to have the potential to boost total intra-African trade by 5.7 per cent, equivalent to almost $5 billion, in the short term. All exports within the continent must by definition be equal to all imports from within the continent; therefore, intra-African trade here can be considered equivalently to exports or imports.

The relatively low impact of the AfCFTA from tariff elimination alone is consistent with estimates from other partial equilibrium models (Bayale, Ibrahim and Atta-Mensah 2022; Fouda Ekobena et al. 2021; Lunenborg and Roberts 2021; Mulugeta 2020; Oyelami 2021; Seti and Daw 2022). These focus on the shorter to medium term and tend to forecast somewhat lower magnitudes of impact than general equilibrium models. Assumptions on the impact of the AfCFTA on non-tariff barrier reductions and trade facilitation improvements account for much of the much larger estimated effects of the AfCFTA in the

Table 6.4: Impact of the AfCFTA, by HS section

	AfCFTA impact				
	Increase in intra-African trade		Trade diversion		
	Nominal (US$m)	Per cent (%)	from existing intra-African suppliers (US$m)	from world suppliers (US$m)	Total change in imports (US$m)
Animal and animal products	152	4.9	–23	–81	71
Vegetable products	281	5.4	–34	–184	97
Foodstuffs	411	6.0	–32	–228	183
Mineral products	764	3.2	–51	–552	212
Chemicals and allied industries	432	5.6	–46	–271	161
Plastics/rubbers	287	10.3	–12	–200	88
Raw hides, skins, leather and furs	9	7.8	–0.2	–6	3
Wood and wood products	155	6.4	–13	–94	62
Textiles and apparel	286	10.7	–14	–186	99
Footwear/headgear	43	9.3	–2.1	–27	16
Stone/glass	222	3.0	–88	–94	127
Metals	535	5.0	–25	–354	181
Machinery/electrical	759	12.3	–21	–572	187
Transportation	427	6.7	–118	–255	173
Miscellaneous	194	15.5	–5	–137	57
TOTAL	**4957**	**5.7**	**–485**	**–3241**	**1716**

Notes: The model and data used to generate these results are outlined in Appendix A. The results show the impact of full liberalisation across all products and countries, rather than make assumptions about the products that some countries may exclude from liberalisation. Elasticity sensitivity analysis is shown in Appendix B.

general equilibrium models of the IMF (2019), the World Bank (2020; 2022) and the ECA (2021).[4]

Not all increases in trade brought about by the AfCFTA are 'new'. In many instances, the intra-African trade boosted by the AfCFTA arises from trade diverted away from other suppliers – what is known as 'trade diversion'. This includes both suppliers within the continent (such as intra-REC trade that

would now face competition from other African suppliers from outside these RECs) and 'world suppliers' from outside the continent.

Table 6.4 shows the estimated degree of trade diversion. This is the amount of trade that switches from a previous importing partner to a new partner as a result of the change in tariffs making new intra-African suppliers more competitive. In this context, trade diversion is split to show the trade that has been diverted away from intra-African and world suppliers, by HS section. For instance, some maize imports from Uganda to Kenya might be replaced by new imports of maize from South Africa as a result of the AfCFTA, which would be counted as trade diversion from existing intra-African suppliers. Other maize imports into Kenya from India might also be replaced by South Africa, which would be considered to have been diverted from world suppliers. Though the AfCFTA is expected to result in trade diversion between African suppliers, this is small.

About two-thirds of the increase is expected to come from trade diverted from outside the continent and the remainder (22 per cent) from trade creation. The relatively small share of trade diversion between African suppliers owes to the relatively small share of African suppliers in current import flows. In other words, there is little pre-existing intra-African trade to be diverted away from.

Consistent with modelling efforts by other authors (ECA 2021; IMF 2019; World Bank 2020; World Bank 2022), this model forecasts that the AfCFTA will stimulate the largest increases in intra-African trade in manufacturing. This importantly helps the AfCFTA to contribute to Africa's structural transformation and industrialisation, an explicit objective of the Agreement Establishing the African Continental Free Trade Area.[5] The forecast impact on the agricultural sector is nevertheless still important, with intra-African trade in foodstuffs, vegetable products and animal and animal products increasing by 6 per cent, 5.4 per cent and 4.9 per cent, respectively.

Impact of the African Continental Free Trade Area on the agriculture sector by value chain segment

A detailed breakdown of the results for each segment of the agriculture value chain is shown in Table 6.5. In absolute terms, the AfCFTA boosts intra-African trade most in the downstream part of the value chain concerned with foods. The gains to trade in food are larger, in absolute terms, than all other parts of the value chain combined. The reason the gains are so much higher in this part of the value chain is that it is the part of the value chain that currently faces the high tariffs, where the value of imports is largest, and where African producers already have some capacity and existing trade flows to scale up.

Intra-African trade gains are smallest, in absolute terms, for trade in inputs and capital. Tariffs are already relatively low in these parts of the value chain so the benefit of tariff liberalisation under the AfCFTA will be less noticeable. Nevertheless, in percentage terms, the impact on agricultural capital is quite large, at 8.2 per cent.

Table 6.5: Impact of the AfCFTA, by segment of the agriculture value chain

	AfCFTA impact				
	Increase in intra-African trade		Trade diversion		
	Nominal (US$m)	Per cent (%)	from existing intra-African suppliers (US$m)	from world suppliers (US$m)	Total change in imports (US$m)
All foods	715	5.3	−84	−402	313
Agricultural raw materials	160	7.5	−8	−111	50
Agricultural capital	81	8.2	−3	−62	19
Agricultural inputs	58	2.8	−4	−34	24
TOTAL	1015	5.4	−99	−609	406

Notes: The model and data used to generate these results are outlined in Appendix A. The results show the impact of full liberalisation across all products and countries, rather than make assumptions about the products that some countries may exclude from liberalisation.

Impact by main agricultural products

Table 6.6 further disaggregates results for the agriculture value chain by main products. This helps to identify the key products driving the impact of the AfCFTA.

The most substantial potential for intra-African trade gains is found in the foods part of the value chain. Within this part of the value chain, there is most potential for the AfCFTA to boost intra-African trade in fish and seafood, sugar, fruit, tobacco, preparations of cereals, vegetables, vegetable oils, beverages and dairy. There are also relatively sizeable opportunities for exports of coffee. Among the more value-added products there are important opportunities for exporters of agricultural machinery and fertilisers.

What is also of note is the relatively small impact the AfCFTA is forecast to have on trade in staple/food security crops, including wheat, maize, millet, sorghum and soya beans. This is because these are products for which average tariffs are already low, meaning that tariff reductions resulting from the AfCFTA can only have a minimal effect. Only other interventions, such as reducing non-tariff barriers, could have the potential to have a transformative impact on intra-African trade in such goods.

Table 6.6: Impact of the AfCFTA on the agriculture sector, by main products

	AfCFTA impact				
	Increase in intra-African trade		Trade diversion		
	Nominal (US$m)	Per cent (%)	from existing intra-African suppliers (US$m)	from world suppliers (US$m)	Total change in imports (US$m)
Vegetables	31	4.1	−3	−18	12
Wheat	15	3.6	−8	−8	8
Beef	6	4.2	−0.4	−4	3
Dairy	25	4.7	−1	−15	10
Fish and seafood	147	7.8	−23	−62	85
Fruit	54	7.0	−9	−26	28
Maize	16	3.3	−6	−7	9
Millet	0	1.0	−0.1	−0.1	0
Palm oil	17	2.6	−2	−12	5
Preparations of cereals	48	7.0	−3	−31	17
Sorghum	1	1.8	−0.1	−1	0
Soya beans	0.05	0.1	−0.2	−0.02	0
Vegetable oils	38	8.3	−1	−29	9
Beverages	28	3.2	−3	−12	16
Sugar	107	7.6	−8	−72	35
Citrus fruit	3	5.1	−1	−1	3
Tobacco	48	4.6	−4	−18	30
Nuts	4	10.2	0	−2	2
Poultry	16	10.1	−1	−12	4
Rice	3	0.9	−1	−3	1
Other food	108	4.0	−10	−70	37
All foods	**715**	**5.3**	**−84**	**−402**	**313**

(Continued)

Table 6.6: (Continued)

	AfCFTA impact				
	Increase in intra-African trade		Trade diversion		
	Nominal (US$m)	Per cent (%)	from existing intra-African suppliers (US$m)	from world suppliers (US$m)	Total change in imports (US$m)
Coffee	73	25.9	−1	−58	16
Tea	5	1.3	−1	−3	2
Cocoa	15	7.8	−1	−8	7
Wood	7	1.8	−2	−3	5
Flowers	1	10.2	0	−1	0
Fibres	28	16.4	0	−19	9
Cotton	1	0.5	−1	−1	0
Other agri-cultural raw materials	29	5.9	−1	−18	11
All agricultural commodities	**160**	**7.5**	**−8**	**−111**	**50**
Machinery	75	10.0	−3	−57	17
Tools	0.2	1.7	−0.02	−0.1	0
Tractors	6	2.7	−0.2	−5	1
All agricultural capital	**81**	**8.2**	**−3**	**−62**	**19**
Fertilisers	42	2.3	−3	−22	20
Insecticides	16	5.6	−0.2	−12	4
All agricultural inputs	**58**	**2.8**	**−4**	**−34**	**24**
TOTAL	**1015**	**5.4**	**−99**	**−609**	**406**

Notes: The model and data used to generate these results are outlined in Appendix A. The results show the impact of full liberalisation across all products and countries, rather than make assumptions about the products that some countries may exclude from liberalisation. Elasticity sensitivity analysis is shown in Appendix B. Table is shaded, with darker cells showing larger values.

6.4 Country-level impacts

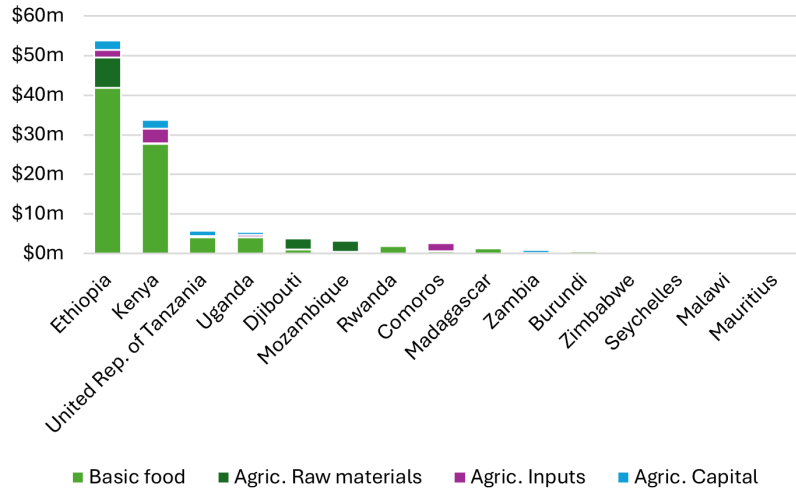
This section breaks down the results at the country level, showing the potential impact of the AfCFTA on intra-African imports by the segments of the agriculture value chain. These results are driven by the prevailing structure of tariffs and trade. The greatest impact is seen in countries (and value chain segments) where both existing intra-African trade and tariffs are large. This makes sense; it is exactly *those* tariffs on *that* trade that the AfCFTA will liberalise.

East Africa

In East Africa, the impact of the AfCFTA on the agriculture sector is forecast to be largest in absolute terms in Ethiopia. Ethiopia does not fully implement any of the REC FTAs (it reportedly applies just a 10 per cent reduction to tariffs on imports from Common Market for Eastern and Southern Africa (COMESA) members), and so has much higher average tariffs on intra-African trade than most other countries in the region. It also has, in general, higher tariffs than many other countries and is a relatively large economy by regional standards.

Much of the relatively large forecast increase in imports into Kenya are products from South Africa, including fruits, sugar and agricultural machinery,

Figure 6.2: Forecast increase in intra-African imports as a result of the AfCFTA in Eastern Africa, by country and value chain segment (US$ million)



Notes: The model and data used to generate these results are outlined in Appendix A. The results show the impact of full liberalisation across all products and countries, rather than make assumptions about the products that some countries may exclude from liberalisation. We use the regional classification provided by United Nations Department of Economic and Social Affairs (UN DESA n.d.).

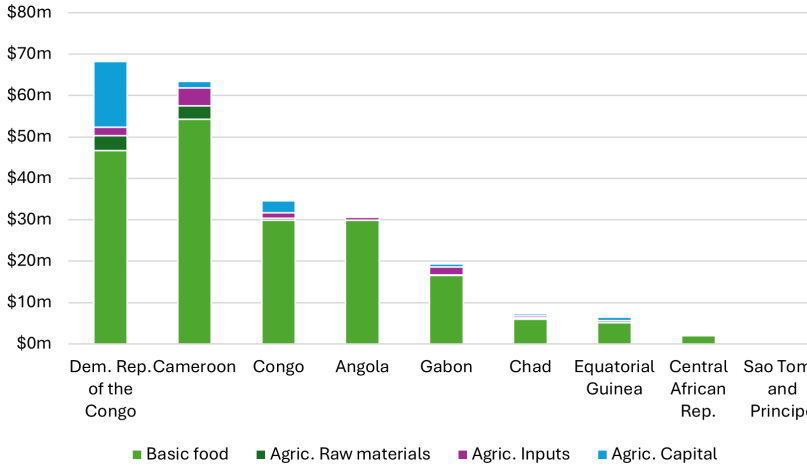
but also maize from Egypt. Kenya is a gateway to the region that already has trade flows existing with other parts of the continent. For Tanzania, the main increases in imports are sugar, vegetable oils, preparations of cereals, machinery, and insecticides from Egypt.

The impact of the AfCFTA is forecast to be marginal on agriculture imports for the other countries of East Africa, as shown in Figure 6.2 (which comprises all countries based on the UN definition of East Africa). This is because most of their intra-African trade already occurs through pre-existing REC FTAs (especially the EAC and COMESA) or because, in the case of the Seychelles and Mauritius, they already have very low most-favoured nation (MFN) tariffs on these products.

Central Africa

In Central Africa, the AfCFTA is forecast to have the most potential for increasing agriculture imports into Democratic Republic of the Congo (DRC) and Cameroon, two of the larger markets in the region that both trade with their neighbours outside the Economic Community of Central African States free trade area, as shown in Figure 6.3. A large share of this increase would be imports from South Africa because, while the DRC is a member of the Southern African Development Community (SADC), it does not implement the SADC FTA, which would otherwise cover this trade.

Figure 6.3: Forecast increase in intra-African imports as a result of the AfCFTA in Central Africa, by country and value chain segment (US$ million)



Notes: The model and data used to generate these results are outlined in Appendix A. The results show the impact of full liberalisation across all products and countries, rather than make assumptions about the products that some countries may exclude from liberalisation.

Much of the potential new agriculture imports to Central Africa is fish and seafood, especially from West Africa but also Southern and North Africa. Other important imports are preparations of cereals, vegetables, fruits and sugar, also from Southern and North Africa.

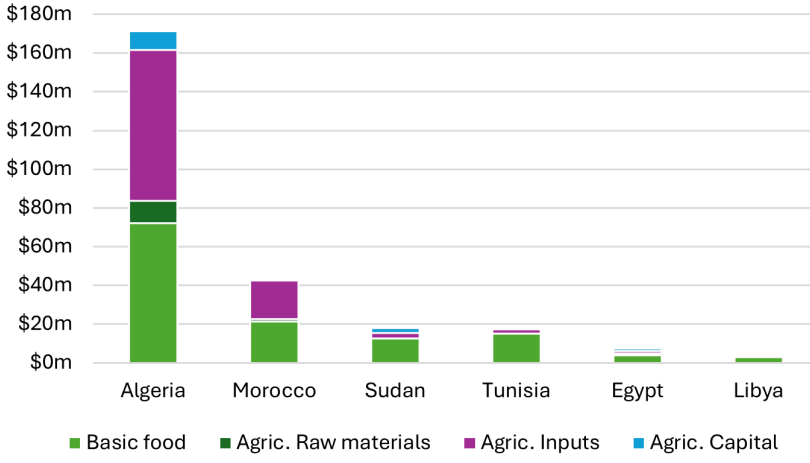
North Africa

In North Africa, most of the potential for increased intra-African agriculture trade is in Algeria (see Figure 6.4). The AfCFTA would see a reduction in tariffs applied by Algeria on products from several of its neighbouring North African countries, but also other countries around the continent, from which it imports coffee, fruits, fish and seafood and tobacco.

For Morocco, Sudan and Tunisia, the increases in imports come from around the continent and involve coffee, fish and seafood, agricultural machinery, fruits, beef, sugar and coffee.

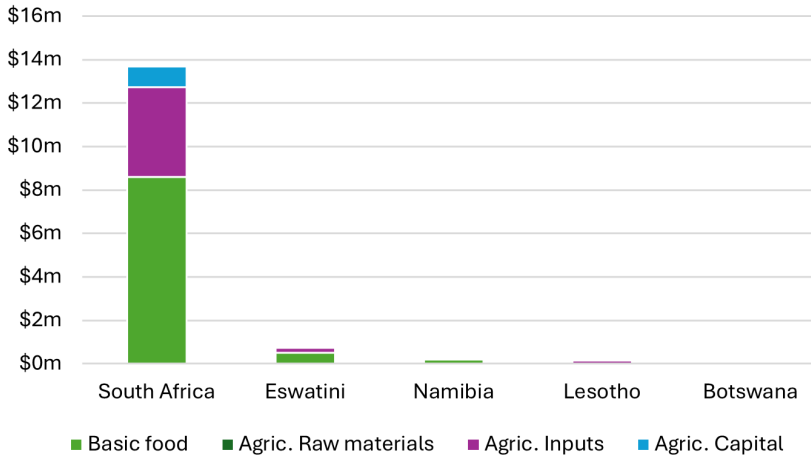
Increased imports into Egypt might seem surprisingly low, given the size of the Egyptian economy. This is because many agriculture imports into Egypt from other African countries are already duty-free, owing to its participation in both the COMESA agreement or the Agadir and Pan-Arab FTA arrangements with its North African neighbours. As such, the AfCFTA does little to boost agriculture imports into Egypt. Libya has very low tariffs to begin with, and so there is little scope for improvements in market access offered through the AfCFTA. As a result, the AfCFTA does little to boost intra-African trade to Libya.

Figure 6.4: Forecast increase in intra-African imports as a result of the AfCFTA in North Africa, by country and value chain segment (US$ million)



Notes: The model and data used to generate these results are outlined in Appendix A. The results show the impact of full liberalisation across all products and countries, rather than make assumptions about the products that some countries may exclude from liberalisation.

Figure 6.5: Forecast increase in intra-African imports as a result of the AfCFTA in Southern Africa, by country and value chain segment (US$ million)



Notes: The model and data used to generate these results are outlined in Appendix A. The results show the impact of full liberalisation across all products and countries, rather than make assumptions about the products that some countries may exclude from liberalisation.

Southern Africa

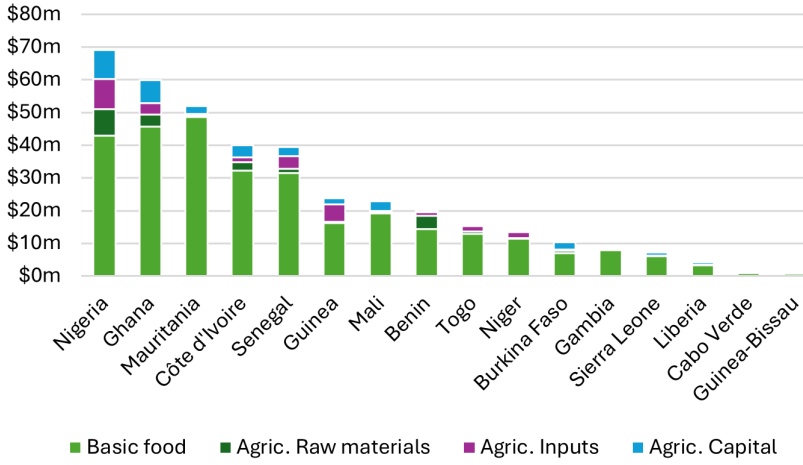
South Africa is by far the largest economy in the Southern Africa region and unsurprisingly accounts for most of the potential for agriculture imports under the AfCFTA (Figure 6.5). Important potential for new imports into South Africa includes fruit, fish and seafood from North Africa, coffee and vegetables from East Africa, and fish and seafood from West Africa. Nevertheless, the impact of the AfCFTA on imports into South Africa is surprisingly modest, possibly owing to how highly competitive its domestic economy is.

Eswatini, Namibia, Lesotho and Botswana already import most of their intra-African agriculture goods from South Africa duty-free under the Southern African Customs Union trading arrangements. As a result, the AfCFTA does very little to increase their intra-African imports. For these countries, the AfCFTA also does not appear to create substantial trade diversion away from imports from South Africa to other economies elsewhere in the continent.

West Africa

Increases in imports to West Africa driven by liberalised trade with other parts of the continent will be significant (Figure 6.6). Although Nigeria is by far the largest economy in West Africa, increases in intra-African imports

Figure 6.6: Forecast increase in imports as a result of the AfCFTA in West Africa, by country and value chain segment (US$ million)



Notes: The model and data used to generate these results are outlined in Appendix A. The results show the impact of full liberalisation across all products and countries, rather than make assumptions about the products that some countries may exclude from liberalisation.

are only forecast to be marginally larger for Nigeria than for other West African countries, such as Ghana, Mauritania, Côte d'Ivoire and Senegal. This stems from the pre-existing intra-African trade flows, which are relatively limited for Nigeria. Most Nigerian food imports are sourced from outside the continent, for instance.

Important new intra-Africa imports into West Africa include sugar, fruits, dairy, vegetables and agricultural machinery from South Africa, and dairy, fish and seafood and fertiliser from North Africa.

Summary

A detailed partial equilibrium model was used to simulate the impact of the AfCFTA. This allowed its effects to be forecast at a highly detailed level of disaggregation to show likely implications for different segments of the agriculture value chain and for specific products.

The impact of the AfCFTA on intra-African trade is relatively modest. That is because much of that trade is already liberalised through pre-existing subregional trade agreements across the continent, such as those of the EAC, COMESA, SADC, ECOWAS, the Pan-Arab FTA and the Agadir Agreement. It is through these subregional arrangements that most of Africa's *current* intra-African trade in the agriculture sector flows.

What the AfCFTA is really doing is liberalising the (currently) smaller shares of intra-African trade that flow *between* regions, such as from Southern Africa to West Africa, or North Africa to Eastern Africa. Tariffs on these goods are high, averaging 18 per cent for vegetable products and 19 per cent for foodstuffs, for instance. It is the liberalisation of this trade that drives the modelled estimates and for which we will expect the AfCFTA to have most impact.

Where the impact of the AfCFTA is expected to be largest in the agriculture sector, in the immediate term, is in the downstream consumable food part of the value chain, and especially with higher-unit-value foods like fish and seafood, vegetables, preparations of cereals, vegetable oils, fruits and dairy. There are also relatively sizeable opportunities for exports of sugar and coffee, within agricultural commodities. Though the opportunities for trade creation in the upstream part of the value chain are smaller in total, there are important opportunities for exporters of agricultural machinery, fertilisers and pesticides. We might expect South Africa to begin supplying more of the continent's needs for agricultural machinery, while more fertilisers and pesticides could be expected from North Africa.

The AfCFTA is likely to have less of an impact on trade in staple/food security crops, including wheat, maize, rice, millet, sorghum and soya beans. These products already have, on average, low tariffs or are traded through informal cross-border trade, as well as by suppliers outside the continent. As a result, the AfCFTA is expected in the short term to have little direct impact on food security through an accessibility channel unless it can go beyond merely reducing tariffs. To improve food security, the AfCFTA will need to do more to address non-tariff barriers, attract investments, and facilitate a broader coordination of relevant policies.

It is also worth raising an inherent limitation of almost all ex ante trade models, which is that they must (necessarily) be fed with data on current trade flows. They are able to scale up, and down, those trade flows to show where demand is created and substituted between import suppliers. However, they are unable to simply create new trade flows where they did not previously exist. This inherent feature of such modelling might be compared to driving looking only in the rear-view mirror, failing to see a possible turning in the road ahead. Identifying, and seizing, such wholly new opportunities would be at the heart of a more impactful AfCFTA on the agriculture sector and will require bold vision by African leaders.

The main conclusion is exactly that. If the AfCFTA is to have a transformative impact on Africa's agriculture sector it must entail much more than just tariff liberalisation (though tariff liberalisation is a starting point that would certainly help). The AfCFTA will need to stimulate the creation of wholly new patterns of trade through enticing investments, coordinating policies and addressing non-tariff barriers, which are often more burdensome than merely tariffs for agricultural trade. Part of the solution can also entail leveraging

informal cross-border trade, which exists in substantial quantities (Gaarder, Luke and Sommer 2021) but is, by its definition, unrecorded and does not flow between countries through typical formal trade routes. Chapter 5 discussed the magnitude of such trade.

Notes

[1] Article 19, paragraph 2 reads: 'State Parties that are members of other regional economic communities, regional trading arrangements and custom unions, which have attained among themselves higher levels of regional integration than under this Agreement, shall maintain such higher levels among themselves.'

[2] Note that when aggregated, as in Table 6.1, import-weighted tariffs may underestimate the restrictiveness of the tariffs when comparing different products (since the variance of the tariffs and the import demand elasticities can be different within each grouping). Intuitively, this owes to businesses importing less of products that are tariffed highly. That does not, however, affect the underlying modelling (which is undertaken at the more disaggregated HS-6 level, where tariffs are not aggregated to this extent).

[3] However, other measures that are foreseen in the AfCFTA (tackling non-tariff barriers and improving preference utilisation) could have a significant effect, even where tariffs are low (De Melo, Sorgho and Wagner 2023; United Nations Conference on Trade and Development 2019).

[4] In fact, heroic assumptions about non-tariff barriers, trade facilitation and other measures, account for almost 97.5 per cent of the estimated impact of the AfCFTA in the models of the World Bank (2022) and the IMF (2019).

[5] See Article 3 (e) and (g) of the Agreement Establishing the African Continental Free Trade Area.

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Appendix A. Model, data and reform scenario

Reform scenario

The reform scenario simulates the AfCFTA with a focus on the agriculture sector. In so doing, it intends to show the potential of tariff liberalisation under the AfCFTA, rather than other aspects such as decisions over exclusion lists, trade facilitation assumptions, reductions in non-tariff barriers, or efforts in the areas of trade in services, investment, competition policy, intellectual property rights or other areas.[1] These supplementary aspects require stronger assumptions and researchers use a different approach to model them.

The reform scenario reflects full implementation of the AfCFTA once the complete course of any incremental tariff reductions has been applied. It applies tariff liberalisation to all goods rather than make assumptions over sensitive product and exclusion lists.

What trade models like that used here can do is to scale up, or down, existing trade flows in proportion to changes in other variables such as tariffs. They cannot create wholly new trade flows from nothing. As such, modelling exercises such as this one may fail to identify where brand new trade flows may emerge between trading partners that did not previously trade certain products. That is more likely to happen in instances where a trade agreement results in a very large change in some tariffs.

Structure of the dataset

Trade flows data is taken from the BACI dataset of reconciled trade flows prepared by CEPII, which is in turn based on data reported by countries to the United Nations Statistical Division Comtrade dataset.

Both exporting and importing countries report data for Comtrade. The CEPII-BACI dataset reconciles these two mirror sources of reported trade data into a single dataset. This is done through an approach that reflects the reliability of different reports of the same trade flows while stripping out insurance and freight costs to express all trade data in terms of their free-on-board price. Doing so uses all available information to maximise data coverage in instances where reporting may be incomplete or of varying qualities of reliability. This is particularly valuable in trade, such as intra-African trade, that comprises flows between less-developed countries, many of which have less well-resourced data collection systems in place. It also makes our work easier and results more intuitive; what Ghana exports to Kenya becomes exactly which Kenya imports from Ghana.

A three-year average of trade flows from 2017 to 2019 is used. These years are the most recent consecutive three-year period that can be considered to represent 'normal' trade flows unaffected by the economic volatility of the Covid-19 pandemic. These were also the three years at the time of writing with the highest number of observations (distinct combinations

of importer–exporter–product with at least one non-zero trade flow) in the BACI dataset (CEPII n.d.), indicating superior reported data coverage.

HS revision 2002 was used. Why not the more recent HS revisions 2007, 2017 or 2022? A number of African countries do not yet report trade flows data in more recent HS revisions, meaning that they are excluded from data that includes only more recent formats (CEPII n.d.). Using an older revision allows the maximum amount of reported trade data to be used in the analysis.[2] HS revisions are backward-compatible, meaning that data captured in more recent versions can be transposed into older versions (but not vice versa).

The CEPII-BACI dataset that was chosen for this study results in comprehensive coverage of countries and products and relatively reliable coverage for countries with less well-resourced reporting systems. It allows analysis at the subheading level of the HS, which in turn allows its reconstitution into appropriate levels of aggregation for the presentation of our results, including at each segment of the agriculture value chain.

Tariff data is drawn from two sources. Where available, data was taken from countries' submissions to the WTO integrated database of applied tariffs for all WTO members as well as some countries that have submitted tariff information to the WTO but are not WTO members, for instance during ongoing accession negotiations.

The most recent year of submitted tariff data was used for each country. Typically, this was for the year 2020 or 2021, allowing a highly up-to-date analysis of tariff information, although, where unavailable, older tariff schedules were used for a few countries. Such data was available in the HS 2017 nomenclature for 43 countries and in earlier nomenclatures for a further four countries. UN Trade Statistics correspondence tables were used to convert all tariff schedules into the 2002 revision in alignment with the trade flows data used.

Not all members of the AfCFTA are members of the WTO or have otherwise submitted tariff schedules to be reported in the WTO integrated database. Tariff data for a further four countries was taken from ITC's MAcMap tariff database.[3]

No publicly available tariff data was available for four AfCFTA participating countries (Eritrea, Sahrawi Republic, Somalia and South Sudan). The impact of the AfCFTA on imports into these countries could therefore not be calculated. However, exports from these countries into other AfCFTA member countries is captured and included in the analysis through mirror reporting.

Model specification

In order to calculate the percentage change in the price of good k from exporter i due to a change in tariff t, the model uses the following formula:

$$\frac{\Delta p_i}{p_i^{old}} = \frac{\left[\frac{p_i^{new}}{p_{wld}}\right] - \left[\frac{p_i^{old}}{p_{wld}}\right]}{\frac{p_i^{old}}{p_{wld}}} = \frac{\left(1+t_i^{new}\right) - \left(1+t_i^{old}\right)}{\left(1+t_i^{old}\right)} = \frac{t_i^{new} - t_i^{old}}{\left(1+t_i^{old}\right)}$$

where superscripts 'new' and 'old' denote the prices and tariffs before and after the policy reform.

The import response is calculated in two consecutive steps. The first step is the substitution between different exporters due to changes in their relative tariff rates. A given expenditure for imports of good k is reallocated across different exporters following the change in relative prices as follows:

$$M_i^{ES} = \left[\frac{\Delta p_i}{p_i^{old}}\gamma_i^{ES} + 1\right] M_i^{old} \frac{\sum_{i=1,..,n} M_i^{old}}{\sum_{i=1,..,n}\left(\left[\frac{\Delta p_i}{p_i^{old}}\gamma_i^{ES}\right] M_i^{old}\right)}$$

where M_i^{ES} stands for the imported quantity from i after exporter substitution, M_i^{old} is the imported quantity from i before reform, and γ_i^{ES} is the exporter substitution elasticity for imports from country i.

The second step is the demand effect. It depends on the price change for the total basket of imports $\overline{P}$, as a result of the price change on imports from country i, which is given by:

$$\frac{\Delta \overline{P}}{\overline{P}^{old}} = \sum_{i,..,n}\left[\frac{M_i^{old}}{\sum_{i,..,n} M_i^{old}} \frac{\Delta p_i}{p_i^{old}}\right]$$

which, through the elasticity of demand μ^D, leads to a change in the total demand for imports from all sources M^{ED}.

$$M^{ED} = \left[\frac{\Delta \overline{P}}{\overline{P}^{old}}\mu^D + 1\right] M^{old}$$

resulting in the new import quantity M_i^{new} from country i as follows:

$$M_i^{new} = M_i^{ES} + \left[M^{ED} - M^{old}\right]\left[\frac{M_i^{old}}{\sum_{i,..,n} M_i^{old}}\right]$$

Structural parameters

The values of exporter substitution and demand elasticities are subject to some uncertainty. Three versions of the model were therefore prepared using different values for these parameters. In the first 'low elasticity' model, lower end estimates of exporter and demand elasticities are used. In it, importers are less sensitive in their sourcing decisions to tariff-price changes. This results in a much smaller estimated impact of the AfCFTA. A second 'high elasticity' model was developed for comparison. Finally, a third model relying on the elasticities used in the standard Global Trade Analysis Project (GTAP) model was developed. In this third model, exporter substitution elasticities vary across sectors and demand elasticities change depending on the country that is doing the importing, which is more realistic. The GTAP elasticity parameters are closer to, and in fact on average exceed those of, the 'high elasticity model'. This is because they consider a longer time horizon in which consumer decisions have had better chance to adjust to changing prices.

The 'low elasticity' and 'high elasticity' models benefit in that their results are determined entirely by differences in the structure and shape of tariffs and trade flows, rather than assumptions over relative differences between products and countries' elasticity parameters (since these are uncertain, using a model in which they drive the results in different countries could lead to erroneous conclusions being drawn). Their results might be argued to be more transparent and are used in different ways by a number of authors (Brenton, Hoppe and von Uexkull 2007; ECA, AU and AfDB, 2017; Lunenborg and Roberts 2021; MacLeod and von Uexkull 2016; Andriamananjara et al. 2009).[4] However, to improve relative comparability with most of the existing literature, the results in this paper (unless otherwise specified) rely on the third model, which uses the GTAP elasticities. These have the advantage of more realistically varying by product and importer country though at the cost of making the model somewhat more complex and less intuitive. Comparative results for the 'low elasticity' and 'high elasticity' models are included in Appendix B and details of all elasticity parameters included in Appendix C.

In the partial equilibrium model, a preferential liberalisation of a given tariff affects not only the overall price level of the good but also the relative prices of the different varieties. Through the import demand elasticity and the substitution elasticity, this will lead to changes in the aggregate level of spending on that good, as well as changes in the composition of the sourcing of that good. Both channels affect bilateral trade flows. The model estimates the potential impact of a given tariff reform scenario on both source specific and total imports, at the HS 6-digit level. This level of disaggregation reduces the risk of biases in calculating and operating with *average* tariff rates across groups of products and allows the results to be reconstituted into intuitive product categories for the value chain and for the decisions that negotiators are making.

Appendix B. Elasticity sensitivity analysis: comparative low and high elasticity models, by HS section

Table 6.7: Low elasticity parameters: Impact of the AfCFTA, by HS section

	AfCFTA impact				
	Increase in intra-African trade		Trade diversion		
	Nominal (US$m)	Per cent (%)	from existing intra-African suppliers (US$m)	from world suppliers (US$m)	Total change in imports (US$m)
Animal and animal products	63	2	−8	−25	38
Vegetable products	117	2	−12	−47	69
Foodstuffs	190	3	−13	−80	111
Mineral products	160	1	−10	−73	87
Chemicals and allied industries	120	2	−10	−57	63
Plastics/rubbers	74	3	−2	−41	33
Raw hides, skins, leather and furs	2	2	−0.1	−1	1
Wood and wood products	46	2	−3	−22	24
Textiles and apparel	73	3	−2	−35	38
Footwear/headgear	11	2	−0.4	−5	6
Stone/glass	69	1	−17	−22	48
Metals	136	1	−5	−67	69
Machinery/ electrical	158	3	−3	−90	68
Transportation	122	2	−20	−54	68
Miscellaneous	45	4	−1	−24	20
TOTAL	**1385**	**2**	**−106**	**−642**	**743**

Notes: Low elasticities: substitution elasticity = 1.5, demand elasticity = 0.5, High elasticities: substitution elasticity = 5, demand elasticity = 1. See Andriamananjara et al. (2009).

Table 6.8: High elasticity parameters: impact of the AfCFTA, by HS section

	AfCFTA impact				
	Increase in intra-African trade		Trade diversion		
	Nominal (US$m)	Per cent (%)	from existing intra-African suppliers (US$m)	from world suppliers (US$m)	Total change in imports (US$m)
Animal and animal products	167	5	–28	–84	83
Vegetable products	315	6	–39	–159	156
Foodstuffs	522	8	–43	–275	247
Mineral products	458	2	–35	–276	182
Chemicals and allied industries	344	5	–35	–204	140
Plastics/rubbers	225	8	–9	–150	75
Raw hides, skins, leather and furs	6	6	–0.3	–4	2
Wood and wood products	132	5	–11	–79	54
Textiles and apparel	211	8	–9	–123	88
Footwear/headgear	30	7	–1.4	–17	13
Stone/glass	181	2	–57	–75	106
Metals	397	4	–18	–243	154
Machinery/ electrical	490	8	–12	–336	153
Transportation	348	5	–71	–198	149
Miscellaneous	136	11	–3	–89	47
TOTAL	**3962**	**5**	**–371**	**–2312**	**1650**

Notes: Low elasticities: substitution elasticity = 1.5, demand elasticity = 0.5, High elasticities: substitution elasticity = 5, demand elasticity = 1. See Andriamananjara et al. (2009).

Appendix C. Elasticity parameters

Table 6.9: Substitution elasticity parameters

GTAP Sector	Description	GTAP Substitution elasticity (γ)	Low substitution elasticity (γ)	High substitution elasticity (γ)
pdr	Paddy rice	10.1	1.5	5
wht	Wheat	8.9	1.5	5
gro	Cereal grains n.e.c.	2.6	1.5	5
v_f	Vegetables, fruit, nuts	3.7	1.5	5
osd	Oil seeds	4.9	1.5	5
c_b	Sugar cane, sugar beet	5.4	1.5	5
pfb	Plant-based fibres	5	1.5	5
ocr	Crops n.e.c.	6.5	1.5	5
ctl	Bovine cattle, sheep and goats,	4	1.5	5
oap	Animal products n.e.c.	2.6	1.5	5
rmk	Raw milk	7.3	1.5	5
wol	Wool, silk-worm cocoons	12.9	1.5	5
frs	Forestry	5	1.5	5
fsh	Fishing	2.5	1.5	5
coa	Coal	6.1	1.5	5
oil	Oil	10.4	1.5	5
gas	Gas	34.4	1.5	5
omn	Minerals n.e.c.	1.8	1.5	5
cmt	Bovine meat prods	7.7	1.5	5
omt	Meat products n.e.c.4.40	8.8	1.5	5
vol	Vegetable oils and fats	6.6	1.5	5
mil	Dairy products	7.3	1.5	5
pcr	Processed rice	5.2	1.5	5
sgr	Sugar	5.4	1.5	5
ofd	Food products n.e.c.	4	1.5	5
b_t	Beverages and tobacco products	2.3	1.5	5
tex	Textiles	7.5	1.5	5

GTAP Sector	Description	GTAP Substitution elasticity (γ)	Low substitution elasticity (γ)	High substitution elasticity (γ)
wap	Wearing apparel	7.4	1.5	5
lea	Leather products	8.1	1.5	5
lum	Wood products	6.8	1.5	5
ppp	Paper products, publishing	5.9	1.5	5
p_c	Petroleum, coal products	4.2	1.5	5
crp	Chemical, rubber, plastic products	6.6	1.5	5
nmm	Mineral products n.e.c.	5.8	1.5	5
i_s	Ferrous metals	5.9	1.5	5
nfm	metals n.e.c.	8.4	1.5	5
fmp	Metal products	7.5	1.5	5
mvh	Motor vehicles and parts	5.6	1.5	5
otn	Transport equipment n.e.c.	8.6	1.5	5
ele	Electronic equipment	8.8	1.5	5
ome	Machinery and equipment n.e.c.	8.1	1.5	5
omf	Manufactures n.e.c.	7.5	1.5	5
ely	Electricity	5.6	1.5	5
Average		**7.0**	**1.5**	**5**

Note: GTAP 6 elasticity parameters available from Dimaranan, McDougall and Hertel (2006).

Table 6.10: Demand elasticity parameters

GTAP Country/ region	GTAP demand elasticities (μ)							Low demand elasticity (μ)	High elasticity (μ)
	GrainCrops	MeatDairy	OthFoodBev	TextAppar	HouseUtils	Mnfcs	TransComm		
EGY	0.61	0.87	0.79	0.92	0.97	1.07	0.99	0.5	1
MAR	0.56	0.88	0.83	0.94	1.01	1.15	1.03	0.5	1
TUN	0.43	0.78	0.81	0.87	0.96	1.15	0.99	0.5	1
XNF	0.52	0.8	0.8	0.88	0.95	1.12	0.98	0.5	1
NGA	0.52	1.28	0.68	1.29	1.31	1.11	1.32	0.5	1
SEN	0.65	0.94	0.81	0.98	1.05	1.09	1.04	0.5	1
XWF	0.68	1.07	0.82	1.09	1.12	1.12	1.14	0.5	1
XCF	0.66	0.97	0.82	1.01	1.05	1.12	1.07	0.5	1
XAC	0.59	1.28	0.7	1.3	1.31	1.11	1.32	0.5	1
ETH	0.37	1.8	0.44	1.81	1.82	1	1.82	0.5	1
MDG	0.58	1.23	0.71	1.25	1.26	1.07	1.27	0.5	1
MWI	0.52	1.41	0.66	1.42	1.43	1.11	1.44	0.5	1
MUS	0.31	0.72	0.79	0.82	0.92	1.09	0.95	0.5	1
MOZ	0.64	1.2	0.76	1.21	1.23	1.12	1.24	0.5	1
TZA	0.69	1.28	0.84	1.3	1.33	1.22	1.34	0.5	1
UGA	0.65	1.34	0.79	1.36	1.37	1.19	1.38	0.5	1
ZMB	0.68	1.1	0.82	1.12	1.15	1.13	1.16	0.5	1
ZWE	0.57	1.15	0.69	1.17	1.18	1.04	1.19	0.5	1
XEC	0.67	1.08	0.82	1.1	1.14	1.14	1.15	0.5	1
BWA	0.46	0.75	0.77	0.83	0.9	1.07	0.93	0.5	1
ZAF	0.31	0.69	0.77	0.8	0.89	1.06	0.92	0.5	1
XSC	0.58	0.82	0.78	0.87	0.93	1.05	0.95	0.5	1
Average	**0.56**	**1.07**	**0.76**	**1.11**	**1.15**	**1.11**	**1.16**	**0.5**	**1**

Note: GTAP 6 elasticity parameters available from Dimaranan, McDougall and Hertel (2006).

Notes (appendices)

[1] Though several states have now submitted tariff schedules under the AfCFTA, not all have, so it would not make sense to apply tariff schedules for only some countries.

[2] In test results using HS17, as much as a fifth of intra-African trade was missing from the data as compared to the results using HS02, for example.

[3] These countries are Ethiopia, Libya, Sao Tome and Principe and Sudan.

[4] Lunenborg and Roberts (2021) use product-specific demand elasticities but common exporter substitution elasticities.