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Implementing the AfCFTA Agreement and implications for Africa's regional value chains

Abstract:

The development of regional value chains (RVCs) and the engagement in global value chains (GVCs) is instrumental to Africa's industrial transformation and economic development. These objectives also closely align with the major goals of the Agreement establishing the African Continental Free Trade Area (AfCFTA) which is currently under implementation. The AfCFTA aims to facilitate intra-continental trade of goods and services, where intra-African trade in intermediate goods and services could go a long way to promote and enhance the development of regional value chains. The development of African RVCs is also expected to subsequently facilitate Africa's participation in GVCs. Against this background, the main objective of this study is to explore how the implementation of the AfCFTA Agreement may provide opportunities to strengthen value chains within Africa.

In this report, we first examine Africa's position in GVCs and the recent development of RVCs. Then, the potential linkages between the AfCFTA Agreement and regional/global value chains are established. In addition, a detailed description of Africa's current tariffs, non-tariff measures, trade structures distinguishing goods and services for final and intermediate consumption is provided. Finally, based on the MIRAGE-VA computable general equilibrium (CGE) model, we simulate the implications of the implementation of the AfCFTA Agreement for RVCs in Africa to identify those sectors and sub-sectors that present the most potential for value-addition and the creation of RVCs.

Key Words: International Trade, Regional and Global Value chains, AfCFTA.

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1. Introduction

The development of regional value chains (RVCs) and the engagement in global value chains (GVCs) is instrumental to Africa's industrial transformation and economic development. These objectives also closely align with the major goals of the African Continental Free Trade Area (AfCFTA) Agreement. The AfCFTA aims to facilitate intra-continental trade of goods and services, where intra-African trade in intermediate goods could go a long way to promote and enhance the development of regional value chains. The development of African regional value chains is also expected to facilitate Africa's participation in global value chains.

In this study, we examine Africa's position in global value chains and the recent development of regional value chains. Based on the MIRAGE-VA computable general equilibrium (CGE) model, we simulate the implications of the implementation of the AfCFTA Agreement for regional value chains in Africa. As part of the AfCFTA reform are considered the trade liberalization within Africa, with a focus on the reduction of tariffs according to the agreed AfCFTA modalities on trade in goods, combined with a 50 percent cut on actionable non-tariffs measures (NTMs) in goods and services. It should be acknowledged that other important issues negotiated under AfCFTA Agreement (e.g. investment, intellectual property rights, competition policy, digital trade, women and youth in trade), for which quantification is challenging or not possible with the model, could bring additional benefits.

Findings clearly show that implementing the AfCFTA Agreement will reshape both intra-African trade and extra-African trade for intermediate and final goods and services.

Notably, the results reveal that implementing the AfCFTA Agreement will lead to an increase in African total exports of final goods and a growth in African total imports of intermediate goods. Findings further indicate a substantial increase in intra-African trade for manufacturing intermediate goods, suggesting the strong potential for developing regional value chains in manufacturing sectors. The implementation of the AfCFTA Agreement will also increase value-added in both manufacturing and processed agrifood sectors. Those results clearly demonstrate the transformative potential of the AfCFTA reform through facilitating value addition within the Continent and further allowing Africa to export relatively higher value-added products than in absence of AfCFTA.

The rest of the report is structured as follows. First, the position of Africa in global value chains is analyzed. Second, potential linkages between the AfCFTA Agreement and regional/global value chains are established. Third, a detailed description of Africa's current tariffs, non-tariff measures, trade structures distinguishing goods and services for final and intermediate consumption is provided. Fourth, the MIRAGE-VA computable general equilibrium model framework and scenarios analyzed are outlined. Fifth, key findings from modeling the implications of the AfCFTA reform on the development of regional value chains in Africa are unpacked. The last section concludes the paper and offers policy recommendations.

2. Africa's position in global value chains

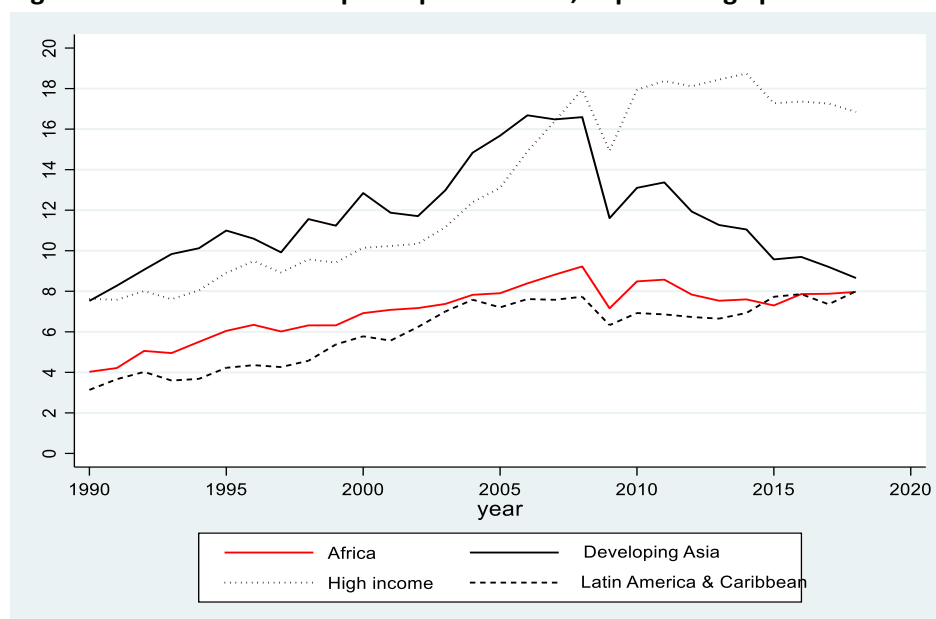
Over the past 30 years, the global system of production has been shaped by the development of value chains that is, firms splitting stages of the production of goods and services, from raw materials to final products to consumers, in different countries. This, in turn, allowed to better exploit comparative advantages and benefit from economies of scale. As a result of outsourcing and offshoring activities, GVCs account for almost 50% of total world trade, even though their development has not progressed since the global financial crisis. The Covid-19 pandemic, the trade war between the US and China, the Ukraine crisis, and the geopolitical polarization across countries worldwide, have also forced to rethink the international fragmentation of production (WDR, 2020; WTO, 2023). Interestingly, regional value chains could benefit from this recent evolution, as firms contemplate reducing risks by “nearshoring” their strategic activities.

Literature suggests that the inclusion in GVCs allows poor countries to foster economic growth, create more valuable jobs and reduce poverty (World Bank, 2020a). Globally and on average, estimates show that a 1% increase in GVC participation generates a greater than 1% increase in per-capita income; an effect twice as large as usual estimates of the trade impact on per capita income (World Bank, 2020a).

However, how beneficial the inclusion in GVCs is depends on countries and the activities they specialize in. The higher the value-added content of the stage of production in which they are involved, the greater the expected positive impacts.

At first glance, Africa does not seem to have benefited much from its participation in GVCs. Indeed, Africa's GVC total participation index stands at 8% of its global GDP in 2018. This is more or less on par with other developing regions, such as Latin America and developing Asia. It is nonetheless important to note the overall positive trend of Africa and Latin America since 1990s, compared to the decline of developing Asia (see Figure 1).

Figure 1: Evolution of GVC participation index, in percentage points of GDP



Source : Authors' calculations, from UNCTAD-Eora database (Casella et al., 2019).

Note: the GVC participation index for a country equals to Foreign value added (FVA) embodied in a country's exports (or backward GVC participation) plus Domestic value added (DVX) of a given country which is embodied in the exports of other countries (or forward GVC participation).

The peculiarities of Africa appear when we split this index into two parts: **Forward participation** (the use of inputs exported by a country in production processes by other countries) and **the backward participation** (foreign value added which is embodied in a country's exports). **Forward Participation**, accounts for almost 6% of African GDP in 2018, a slightly higher value than in the other developing countries considered. In contrast, Africa shows limited **backward participation** in GVC: foreign value added embodied in African exports accounts for around 2% of GDP, and relatively lower than Latin America (4%) and Developing Asia (3%) as shown in Table 1. As a result, forward backward participation is three times less important than forward participation in Africa. This gap is much larger than in the rest of the world.

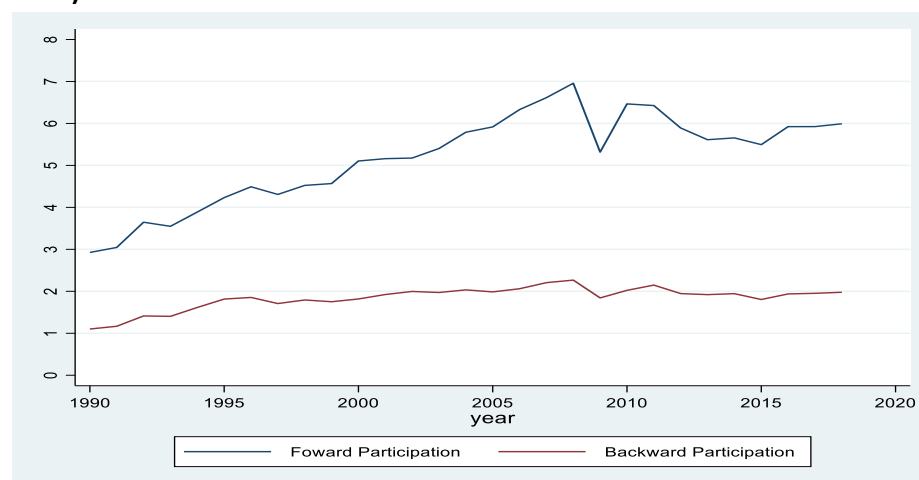
Table 1: Africa's forward and backward participation in GVC, relative to GDP (%), 2018

	Forward participation	Backward participation
Africa	6.0	2.0
Developing Asia	5.6	3.1
Latin America & Caribbean	4.0	4.0
High income	7.7	9.2

Source: Authors' calculations, from UNCTAD-Eora database (Casella et al., 2019).

Moreover, the evolution of Africa's backward participation in value chains have remained relatively limited for the past two decades or so. We observe only a small increase in the backward participation index, from 1.1 in 2000 to 2 in 2018 (see figure 2).

Figure 2: Evolution of Africa's forward and backward participation in GVC, relative to GDP (%) (1990-2018)



Source: Authors' calculations, from UNCTAD-Eora database (Casella et al., 2019). Note: Forward Participation: African value added embodied in the exports of other countries, Backward GVC participation: Foreign value added embodied in Africa's exports.

This relatively low apparent level of backward participation of African economies in GVC is not a positive outcome. Indeed, the literature suggests that a certain level of backward participation contributes substantially and relatively more to the growth of per capita income than similar levels of forward participation (World Bank, 2020a).

The profitable role of backward linkages relies on the acquisition of foreign technology and production methods, which in turn allows domestic firms to increase their competitiveness and upgrade in value chains, creating more productive jobs (AUC/OECD, 2022). For example, in the agrifood value chains, downstream segments help create non-farm jobs in both urban and rural areas. These jobs generate up to eight times more output per worker than farming (see Tschirley, 2015).

Evidence does confirm the positive association of backward participation and economic development in the African context. Table 2 clearly illustrates that the higher the level of backward linkages in Africa, the higher the per capita income.

Table 2: Africa's backward and forward participation in GVC, relative to GDP, by income level in 1990 and 2018.

	(1) Backward participation		(2) Forward participation	
	1990	2018	1990	2018
Africa	1.1	1.9	2.9	6
Africa H (0; 1)	4.2	7.1	2.8	6.9
Africa UM (5;7)	1.3	3.8	4.3	11.2
Africa LM (15; 23)	1.0	1.3	1.9	4.4
Africa L (31;20)	0.5	0.6	1.3	1.3

Source: Authors' calculations, from UNCTAD-Eora database (Casella et al., 2019) and WDI World Bank Database for Income Level based on per capita income thresholds: L= Low income, LM = Lower-middle income, UM = Upper-middle income and H = High income. In parentheses the number of countries belonging to each economic category in 1990 and 2018, respectively. Note that statistics are calculated on 2018 income classification, whereas some countries have been moving from one category to another. It is mostly about upgrading UM to H (Seychelles), from LM to UM (Botswana, Mauritius, Namibia) and from L to LM (Egypt, Ghana, Kenya, Lesotho, Mauritania, Nigeria, Sao Tomé and Príncipe, Sudan and Zambia), while there were only two downgrading transitions from LM to L for Senegal and Zimbabwe.

Another element that emerges from Table 2 is that over time the largest increase in backward linkages is detected under the High-income (H) category (Seychelles) and Upper-middle-income (UM) category due mainly to South Africa and to a lesser extent to Namibia and Gabon. The increase in backward participation remains limited for the two least developed categories Lower-middle-income and Low-income (LM and L) which account for the bulk of African countries, in particular low-income (L) countries. This suggests that attaining a certain level of economic development may be required to benefit relatively more from backward participation.

Putting the stylized facts on GVC participation (Table 2) in perspective with trade data (Table 3), we observe that overall, African countries' participation in GVC is mainly through exports of natural resources and metallurgy that are then further transformed mostly by non-African partners.¹

¹ For some African countries, we can also mention agricultural products (e.g. cocoa for the Ivory Coast and Ghana).

Table 3: Value and shares of African exports by sector and by destination, USD billion and %, 2019

	USD billion		Shares (in %)	
	To Africa	To Rest of the World	Within Africa	With Rest of the World
Agricultural goods	8.6	39.8	10.1	8.2
Vegetable products	7.7	38.5	9.0	7.9
Livestock and animal products	0.9	1.3	1.1	0.3
Processed food	5.9	17.8	6.9	3.7
Agrifood	5.9	17.8	6.9	3.7
Natural resources	24.9	226.2	29.2	46.5
Manufacturing	45.9	202.9	53.8	41.7
Electronics and machinery	16.2	48.7	19.0	10.0
Metallurgy	12.8	109.2	15.0	22.4
Textile and apparel	2.8	19.1	3.3	3.9
Other industries	14.1	25.8	16.5	5.3

Source: Authors' calculations, from BACI database (Gaulier and Zignago, 2010, updated in February 2022). Note: the aggregate Natural resources includes all products corresponding to the following GTAP sectors: Coal (coa), Forestry (frs), Gas (gas), Mineral products (nmm), Oil (oil) Other extraction (omn) and Petroleum and coal products (p_c).

Narrowing down on specifically intra-African trade and regional value chains, the picture is substantially different, with more promising trends.

On the one hand, African economies are relatively open but tend to trade little with themselves based on available statistics for formal trade, relative to their economic size and to other regions of the world, despite the existence of multiple regional trade agreements (Fontagné et al., 2022). They are highly specialized since a few Harmonized System (HS) products account for a large part of their total trade. For instance, in 2019 one single product category (out of the 5,113 categories of products in the HS revision 1 nomenclature) accounts for more than 50% of a country's total exports in half of the African countries, and more than 70% of a country's total exports in a-third of all African countries.² Moreover, African countries mostly integrate into production networks outside the continent. For example, the share of imported inputs within the continent is inferior to that observed in other developing regions. Precisely, in 2018, African countries imported only 15% of their inputs from within the continent, compared to 23% for developing Asian countries (AUC/OECD, 2022). Moreover, for the same year, GVC

² Authors' calculations, from BACI database (Gaulier and Zignago, 2010, updated in February 2022).

participation in Africa remains limited at around just 5% against 15% in the Association of Southeast Asian Nations (ASEAN) (IMF, 2023).

On the other hand, intra-African trade tends to be relatively more diversified than Africa's trade with the rest of the world (see AUC/OECD, 2019 and Carrère, 2013).³ Secondly, intra-African trade is made up of goods with a relatively higher content in terms of value added than Africa's exports to the rest of the world. The shares of processed food and manufacturing are larger in intra-African trade than in Africa's exports to the rest of the world, at 6.9% and 53.8% against 3.7% and 41.7%, respectively (see Table 3). Natural resources account for the bulk (46.5%) of Africa's total exports to the rest of the world against less than a-third (29.2%) of intra-African trade. According to the broad economic categories (BEC) classification, processed and semi-processed goods together accounted for 79% of intra-African exports in 2019, compared with 44% of Africa's exports to destinations outside Africa.⁴ Skill-intensive and high value-added modern services such as telecommunications and business services have been gaining importance in the Africa's production and trade (IMF, 2023). Finally, some progress has been made towards the creation of regional value chains. For instance, Morocco and South Africa have successfully upgraded their automotive production to supply European and other highly competitive markets (see AUC/OECD 2022), whereas South African retailers have built local value chains through offshoring textile manufacturing to neighboring countries (IMF, 2023). Nonetheless, it should be noted that those positive trends around value chains development tend to often involve countries with a certain level economic development, such as South Africa or Morocco, and relative better integrated regions, such as SADC.⁵ Still, such evidence should encourage African countries to pursue their regional integration and economic transformation to capitalize on technological change and foreseen upward demographic trends for the continent. It shall create a strong basis to enhance Africa's competitiveness in international markets.

Before moving to the examination of how the implementation of the African Continental Free Trade Area Agreement could impact Africa's trade and the creation of regional value chains, it must be emphasized that trade statistics do not consider informal trade. Based on existing estimates for informal trade, African countries are thought to trade more with each other than as indicated by available customs statistics. Existing studies on the subject show that the phenomenon is important, especially for trade between neighbor countries and particularly in agricultural commodities, where informal trade can reach or even exceed the value of trade recorded by customs (Bensassi, et al., 2019; Bouët et al., 2018).⁶

³ Using a panel of African firms, AUC/OECD, 2019 report shows that intra-regional exports by African firms are 4.5 times more diverse in terms of products exported than their exports towards outside Africa.

⁴ Authors' calculations, from BACI database (Gaulier and Zignago, 2010, updated in February 2022).

⁵ Among all African regions, only southern Africa showed a sizeable flow of imports and exports of intermediate goods with other countries in the region. Authors' calculations, from BACI database (Gaulier and Zignago, 2010, updated in February 2022).

⁶ The Africa Union (AU), ECA and Afreximbank are working together with member States and Regional Economic Communities to develop a Continental Informal Cross-Border Trade (ICBT) Data Collection Framework and Methodology; see: <https://www.uneca.org/stories/rethinking-informal-cross-border-trade-in-africa>.

3. Putting regional value chains in perspective with the AfCFTA Agreement

Overlapping agreements, often of limited ambition and partially implemented in many cases, have so far failed to bring about a profound reorientation of African exports towards the continent with limited potential for creation of value-added networks.

3.1. Obstacles to African integration

Impediments to regional integration and the creation of value chains are multiple.

The limited economic size and weak complementarity of the specializations of African countries, linked in particular to the weight of primary natural resources in their exports, constitutes a first obstacle. Governance and institutional issues, such as domestic security, limited administrative capacity, overlapping regional trade agreements, add complexity and generate delays, thereby leading to additional costs for intra-African trade.

Tariffs within Africa are still significant as shown in Table 5 under section 4. Numerous other frictions exist, such as non-tariff measures, regulatory discrepancies, inadequate infrastructure, weak trade-related services (logistics, trade finance and payments), adding another layer of costs. Plane (2022) estimates that logistics costs in Africa are four times higher than the world average. More generally, estimates⁷ show that the tariff equivalent of existing trade frictions, or border effects, is substantial, and assessed at around 200% for intra-African trade even after subtracting frictions related to infrastructure or tariffs; noting that about half of it is imputable to the SADC and ECOWAS regions (see Djoumessi et al., 2017). It should however be noted that border effects might be overestimated due to the importance of informal trade on the Continent which by definition is not included in trade statistics. The perceived magnitude of informal trade, often aiming to bypass obstacles to trade, reveals the extent to which the fragmentation of African markets is an impediment to establishing a friendly environment for business and to integrated value chains at the regional level.

3.2. The AfCFTA Agreement in brief

The AfCFTA which constitutes one of the 13 flagship projects of African Union (AU) Agenda 2063 for “The Africa We Want” offers a turning point for effectively deepening Africa’s integration and breaking through the value chains networks.

⁷ The gravity model of trade makes it possible to assess the importance of different obstacles to trade. This model predicts the intensity of trade between countries according to their economic size, trade frictions (not only distance), and the equivalent of the gravitational constant (representing in our case the extent of globalisation). If trade frictions within a country are less than between countries (absence of customs duties, regulatory differences, common currency, etc), we would expect that each country trades more with itself than with other countries. Then, the ratio of the propensity of a country to trade with itself rather than with other countries, all other things being equal, is the best indicator of barriers to trade, observable or not. Once we know the ‘price elasticity’ of international trade – i.e. the response of the volume of imports to a variation in the price of imported products – we can calculate a customs duty equivalent for the revealed trade frictions, called the border effect.

The AfCFTA Agreement came into force on 30 May 2019 and entered its operational phase on 7 July 2019. Trading under the AfCFTA Agreement officially started on 1 January 2021. As of 22 March 2024, 54 of the 55 AU member States have signed the Agreement, with 47 countries having ratified it.

The AfCFTA is the largest FTA in the World by the number of member countries. It has the objective to create a single market, deepening the economic integration of the continent, resolving challenges of multiple and/or overlapping memberships, and paving the way to establish a continental customs union and ultimately the African Economic Community. Among the AfCFTA's strategic objectives are to expand intra-African trade in goods and services, increase competitiveness through economies of scale and diversification, promote industrialization, structural transformation, and gender equality.

Its scope is large, making the agreement ambitious. It covers issues beyond commitments made within the World Trade Organization, so entering in the definition of a deep trade agreement.⁸ As such, one can expect substantial increase in both the backward and forward participation of African countries in GVC. Recent empirical analysis conducted by IMF (2023) finds that both country characteristics and trade agreements are important determinants of countries' integration into GVCs. The IMF study shows that, on average, concluding a trade agreement is associated with a statistically significant 39% increase in bilateral backward and forward participations in GVC. However, while shallow agreements are only associated with 5 percent increase in bilateral backward and forward linkages compared to linkages created between countries trading outside trade agreements, deep agreements (such as NAFTA) seem to have a much larger effect,⁹ even after controlling for country effects and geography.

Negotiations under the AfCFTA Agreement have so far been conducted in two phases. Phase I, which is largely concluded, focuses on relatively more traditional trade areas: trade in goods (including rules of origins, non-tariff barriers, trade facilitation, etc.), trade in services, and a dispute settlement mechanism.

Phase II, also largely concluded but with the various Protocols still to be ratified, includes investment, intellectual property rights, competition policy, digital trade, and women and youth in trade.

Although the depth of the AfCFTA Agreement is clear, it is the effectiveness of its implementation that will really determine how much economic impact the Agreement can really generate. While the achievements to date are still commendable, implementation started relatively slowly and admittedly not facilitated by the Covid-19 crisis. Indeed, if has already mentioned trading under the AfCFTA Agreement was officially launched on 1 January 2021, it is only after the launch of the Guided Trade Initiative (GTI) by the AfCFTA Secretariat in October 2022 that eight pilot countries (i.e. Cameroon, Egypt, Ghana, Kenya, Mauritius, Rwanda, Tanzania, and Tunisia) started exchanging at preferential rates under a limited number of goods. During the first year and a half of the GTI, the number of participating countries increased to over 30 and the scope of products exchanged has expanded.

⁸ Deep trade agreements (DTAs) “cover not just trade but additional policy areas, such as international flows of investment and labor, and the protection of intellectual property rights and the environment. While these legal arrangements are still referred to as trade agreements, their goal is integration beyond trade. DTAs aim at establishing five “economic integration” rights: free (or freer) movement of goods, services, capital, people, and ideas” (World Bank 2020c)

⁹ Estimations suggest that linkages created within NAFTA are more than 8 times larger than the average linkage created by countries outside trade agreements.

Relevant studies examining the implementation of Phase I issues negotiated under the AfCFTA Agreement, predict that the actual share of intra-African trade would substantially increase when considering the removal of trade barriers, in particular non-tariff measures (e.g. doubled by 2045 in Fontagné et al., 2022, or even more in World Bank, 2020c by 2035). Nevertheless, large parts of African exports will still be oriented towards third markets – especially China, largely because of its economic size and growth (two-third in Fontagné et al. 2022, or three-fourth in Fontagné et al., 2024).

Massive improvements in trade facilitation would strongly reinforce the gains from the implementation of the AfCFTA Agreement (World Bank 2020c), as well as the harmonization in regulations in different fields such as services, investment protections, harmonization of competition law and intellectual property rights, and agreement on rules for e-commerce (IMF, 2023).

Additional investment in transport infrastructure (roads, ports, and land borders), as proposed in the Program for Infrastructure Development in Africa (PIDA), could substantially increase continental trade (additional 11.5% for exports) and GDP (+2%) compared to a scenario which considers AfCFTA implementation only (Fontagné et al. , 2023).

In sum, the AfCFTA is a long-term project, embracing the different dimensions of the business environment. It is likely that the AfCFTA will make a difference to the *de facto* fragmentation of the African continent. The integration of African markets, combined with the dynamics in population and urbanisation, could increase the continent’s attractiveness for investors, generating new opportunities for investments on the continent, and foster the creation of production networks. For those theoretical outcomes to meaningfully be felt on the ground, African countries should demonstrate strong legal and institutional commitments, and complement the AfCFTA initiative with efforts aiming at improving governance, physical and human capital as well as macroeconomic stability and financial development.

4. Africa’s current tariffs, non-tariff measures and trade structures

It should be reiterated that in this study only reductions in tariffs and NTMs, in both goods and services, are considered. Other factors that could potentially enhance African regional value chains and facilitate African economies integration into global value chains have not been taken into account. In this respect, our results can be interpreted as representing a relatively lower bound of the expected benefits to be induced by the implementation of the AfCFTA Agreement.

4.1. Overview of Africa’s tariffs and non-tariff measures

As it is assumed that without the AfCFTA Agreement in place average tariffs and NTMs will not change between 2020 and 2045, table 5 directly shows the average trade protection in goods applied and faced by Africa for tariffs and NTMs in 2045 (projection year for CGE modeling simulations; see section 5) without (Business as usual-BaU) vs. with the AfCFTA in place. This allows for easy comparison of expected changes in tariffs and NTMs to be brought about by the AfCFTA reform. Please note that expected tariffs and NTMs in 2045, following the implementation of the AfCFTA Agreement, result from the implementation of the AfCFTA central scenario C as described under Section 5.3.

The non-tariff measures present the ad-valorem equivalent of the NTMs, by Kee, Nicita and Olarreaga (2009). Overall, the level of NTMs on final goods surpasses that of intermediate goods for both NTMs applied by Africa on its imports (from Africa as well as from the rest of the world) and NTMs faced by Africa on its exports (from Africa as well as from outside the continent). For the reference projection 2045,¹⁰ and as far as NTMs for intra-African trade are concerned, the highest level of NTMs is observed for final goods in the agricultural sector (54.1%), followed Industry (50.1%) and Energy (17.8%) sectors. The energy sector is the only one for which NTMs on intermediate goods are higher than on final goods (42.5%), while in intermediate goods in agriculture and industry this is the opposite, with NTMs measuring 42.9% and 39.5%, respectively. Overall the average level of NTMs applied by Africa is larger than NTMs they face from the rest of the world, both in final and intermediate goods. The high barriers applied by african countries apply similarly to intra trade and imports from third countries.

Turning to tariffs, similarly to what we stated for NTMS, duty rates applied by Africa are larger than those applied by the rest of the world to the african continent. Despite the multiple regional trade agreements existing in Africa, intra trade is as much protected as imports from outside the continent. Another common feature is that final goods are more protected than intermediate goods, for instance in intra trade tariffs stand at 9.4 % and 5.5% for final and intermediate goods, respectively.

In sum, it is on average relatively cheaper for Africa to import intermediate goods than final goods (with the exception of energy for NTMs) which at first suggests a promising trend for the transformation of imported inputs to be used for value addition in African production processes. However, there is space to reduce the high protectionism Africa imposes, in particular within the continent.

Implementing the AfCFTA is expected to make a difference, through making trade barriers, NTMS and tariffs, relatively lower for intra-African trade in both final and intermediate goods in all main sectors, reaching almost zero tariffs within the continent, in particular on intermediate goods (see column 4 in Table 5).

More precisely, after full implementation of the AfCFTA Agreement, average intra-African tariffs on intermediate goods would go down to 0.0%, 0.1% and 0.3% in industry, energy and agricultural, respectively. Average intra-African tariffs on final goods would also go down substantially to stand at 1.2% and 3.4% in industry and agriculture, respectively. It is particularly worthwhile to note large decrease in the average intra-African tariff in intermediate goods in industry which would pass from 6.7% without AfCFTA to 0.0% with AfCFTA Agreement's implemented, in 2045. Clearly, successfully implementing the AfCFTA Agreement is critical to reduce the relative cost of intermediate goods in all sectors, and especially for industrial processing within the continent, and potentially favor the development of regional value chains.

¹⁰ Reference projection for NTMs take the value of NTMs in the base year 2014.

Table 5: Average Trade Protection on goods in 2045 without and with implementation of the AfCFTA, %

		NTMs		Tariffs	
		2020 through 2045 under BaAU (i.e. without AfCFTA)	2045 with AfCFTA	2020 through 2045 under BaU (i.e. without AfCFTA)	2045 with AfCFTA
On Intra-Africa Trade					
Agrifood	Final	54.1	40.6	16.6	3.4
	Intermediates	42.9	32.2	7.2	0.3
Industry goods	Final	50.1	43.8	7.6	1.2
	Intermediates	39.5	34.5	6.7	0.0
Energy goods	Final	17.8	15.6	14.8	0.0
	Intermediates	42.5	37.7	3.6	0.1
Total	Final	51.4	42.7	10.6	2.0
	Intermediates	40.9	35.6	5.6	0.1
Applied by Africa on its imports from the rest of the world (i.e. outside Africa)					
Agrifood	Final	65.7	65.7	23.8	23.8
	Intermediates	36.0	36.0	8.3	8.3
Industry goods	Final	43.6	43.6	7.1	7.1
	Intermediates	40.8	40.8	5.7	5.7
Energy goods	Final	16.5	16.5	17.5	17.5
	Intermediates	36.5	36.5	3.7	3.7
Total	Final	46.6	46.6	9.4	9.4
	Intermediates	39.5	39.5	5.5	5.5
Faced by Africa on its exports to the rest of the world (i.e. outside Africa)					
Agrifood	Final	36.6	36.6	10.6	10.6
	Intermediates	42.1	42.1	7.1	7.1
Industry goods	Final	31.1	31.1	3.3	3.3
	Intermediates	24.4	24.4	1.5	1.5
Energy goods	Final	17.5	17.5	7.2	7.2
	Intermediates	28.9	28.9	0.9	0.9
Total	Final	33.0	33.0	5.8	5.8
	Intermediates	27.2	27.2	1.5	1.5

Source: Author's calculations. Final and Intermediate refer to goods intended for final consumption and intermediate consumption by production sectors, respectively. The distinction is made on the basis of the Classification by Broad Economic Categories (BEC) established by the World Integration Trade Solution (WITS) of the World Bank. The non-tariff measures present the ad-valorem equivalent of the NTMs, by Kee, Nicita and Olarreaga (2009). Trade protection under the baseline project is as of 2020 (to be kept unchanged until 2045). The AfCFTA column presents the custom duties at the end of the period of AfCFTA's implementation. The average trade protection is weighted by MAcMap HS6 2014.

Concerning NTMs in Services, we only have estimations for each importer and sector, without differentiating across partners.¹¹ What we can state again from Table 6 is that African countries are more protectionist than the Rest of the World, on average and across all services sectors. Once again AfCFTA allows to reduce these high barriers within the continent, so to easier the exchange of services, whose central role in creating value chains is crucial.

Table 6: Average Trade Protection in services applied by Africa and RoW in 2045 without and with implementation of the AfCFTA, %

	NTMs applied By Africa				NTMs applied by the Rest of the World	
	2020 through 2045 under BaAU (i.e. without AfCFTA)		2045 with AfCFTA		2020 through 2045 under BaAU (i.e. without AfCFTA)	2045 with AfCFTA
	To all partners	Within Africa	To all partners	Within Africa	To all partners	To all partners
Tourism	72.7	72.7	72.7	54.5	52.8	52.8
Transport	68.0	68.0	68.0	51	50.9	50.9
International transport	68.9	68.9	68.9	51.7	46.3	46.3
Financial services	248.8	248.8	248.8	186.6	156.4	156.4
Business services	136.1	136.1	136.1	102.1	63.3	63.3
Education	62.5	62.5	62.5	46.9	52.3	52.3
Health	56.8	56.8	56.8	42.6	43.9	43.9
Communication	91.8	91.8	91.8	68.9	55.2	55.2
Other sevicees	105.1	105.1	105.1	105.1	67.5	67.5
Total	101.3	101.3	101.3	91.7	66.9	66.9

Source: Authors' calculations based on baseline scenario in MIRAGE-VA

Modeling those anticipated changes in intra-African tariffs and NTMs from AfCFTA Agreement's implementation (see Sections 5 and 6) will be essential to quantify the magnitude of expected positive impact of the AfCFTA on RVCs' development.

4.2. Africa's trade structure in 2020

Table 7 shows the shares of intermediate and final consumption of goods and services in both intra-African trade and Africa's trade with rest of the world (exports and imports), with distribution across sectors in 2020.

Firstly, goods and services for intermediate consumption which can usually be used as inputs to the production process represent the bulk of Africa's trade whether within Africa (64.4% of total intra-

¹¹ For the estimation methodology see Fontagné et al. , 2016, which we adapted to GTAP 10.1 database..

African trade) or with the rest of the world (58.9% of Africa's total imports from and 84.7% of Africa's total exports to the rest of the world). Conversely, Africa's trade in goods and services for final consumption that already embed a relatively higher degree of transformation represent the lowest share of Africa's trade; noting that only 15.3% of Africa's total exports to the rest of the world.

As far as Africa's imports are concerned, this is in line with expectations from relatively higher existing tariffs and NTMs imposed on final goods and services than on intermediate goods and services. But as already mentioned under the protection sub-section (4.1), anticipated reductions in intra-African tariffs on goods and NTMs on goods and services for both intermediate and final consumption, following the implementation of the AfCFTA Agreement, may facilitate transformation of African inputs for consumption of final higher value added goods and services. The AfCFTA is therefore anticipated to help raise the proportion of transformed and consumed goods and services within the continent, some of which could ultimately be exported outside the continent.

Secondly, looking at the sectoral composition of Africa's trade split into goods and services for intermediate and final consumption, it should be noted that Africa's imports from the rest of the world are dominated by industrial goods in both intermediate goods and services (53.6% of Africa's total imports of goods and services for intermediate consumption from the rest of the world) and final goods and services (64.8% of Africa's total imports of goods and services for final consumption from the rest of the world). The picture is somewhat different within intra-African trade with industrial goods accounting for the bulk of those goods and services for final consumption (57.7% of total intra-African trade for final consumption) but energy goods representing the largest share of the goods and services for intermediate consumption (44.8% of total intra-African trade for intermediate consumption). In other words, Africa currently largely relies on industrial products imported from outside the continent for its final and most acutely its intermediate consumption. The share of energy products (including raw materials) of low value-added content is not only relatively high in intermediates consumed within Africa but also in Africa's intermediates exported to the rest of the world (see Table 6). This contrasts with the relatively high share of Africa's industrial products (39.2% of Africa's total exports of goods and services to the rest of the world for final consumption), followed closely by services (32.9%), exported to the rest of the world for final consumption. Said differently, Africa's exports of energy are often transformed (such as crude oil being refined) outside the continent and high shares of Africa's industrial products and services for final consumption are exported to the rest of the world. It could be anticipated that the implementation of the AfCFTA reform may somewhat help re-orienting the consumption of final goods and services produced in Africa towards the African market. The CGE modeling analysis will certainly assist in shedding lights on those issues.

Table 7: Shares of intermediate vs. final consumption of goods and services in intra-African trade and in Africa's trade with rest of the World (imports and exports), with distribution across sectors, in 2020, %

	Agrifood	Industry	Energy	Services	Total
Intra-African trade					
Final	33.9	57.7	5.0	3.4	35.6
Intermediate	11.4	41.5	44.8	2.3	64.4
Africa's imports from the rest of the world					

Final	13.1	64.8	5.6	16.5	41.1
Intermediate	10.5	53.6	17.5	18.4	58.9
Africa's exports to the rest of the world					
Final	22.3	39.2	5.6	32.9	15.3
Intermediate	6.1	28.7	53.2	12.0	84.7

Source: Authors' calculations based on baseline scenario in MIRAGE-VA

5. Modeling framework and scenarios

5.1. MIRAGE-VA computable general equilibrium model

The empirical analysis in this paper rely on MIRAGE-VA, a multiregional, multisector, dynamic computable general equilibrium model of the world economy that aims to assess the impact of trade policies, and able to capture interactions between trade and climate policy (Bellora and Fouré, 2019).¹² Its development is based on MIRAGE-e and featured a detailed representation of trade for intermediate goods and final good to account for global value chains (GVCs). The impact of a policy is quantified from the comparison between the projection of the current world and the projection of the world with specific policy scenarios (see Sections 5.2 and 5.3).

In MIRAGE-VA, production combines five primary factors (skilled labor, unskilled labor, capital, land and natural resources), energy and intermediate consumption. The primary factors are assumed to be fully employed.

In each region, a representative consumer accounts for households and government. It maximizes its utility under its budget constraint. It uses part of the income for saving, and rest of the income for acquiring goods and services.

Trade is represented with two different Armington structures, one for trade in final consumption and one for intermediate consumption. This double structure explicitly accounts for GVCs. It captures the preferences of imported goods or services from a given country, destined for final consumption or intermediate consumption. Furthermore, such structure allows for applying policy shocks differentiated by use of the goods and services.

The model relies on the GTAP-MRIO 10.1 Database as a global social accounting matrix and is accordingly calibrated on the 2014 base year. The database decomposes the trade in goods by final and intermediate use that is consistent with the standard GTAP 10.1 Data Base. It covers the world economy, with data disaggregated across 65 sectors and 147 geographic regions. For this analysis, the data were aggregated into 30 sectors and 28 regions or countries (see tables A1 and A2 in the appendix). The GTAP 10.1 Satellite Non-CO₂ GHG Emissions Data Base was used to calibrate the representation of GHG in MIRAGE-VA Trade elasticities are from Fontagné, Guimbard and Orefice (2022), based on the dataset in the GTAP classification from October 2020.

¹² More information of the versions and description of the model is available on mirage-wiki, <https://mirage-model.eu/>

5.2. Reference Scenario

The reference (or Business as usual-BaU) scenario represents the state of the world at a future date, here 2045, considering a number of changes that have occurred since the initial year of calibration (2014) and according to long-term projections of key variables, including anticipated structural changes.

As mentioned under the previous section (5.1), data for the MIRAGE-VA model calibration for the initial year 2014 come from the using the GTAP 10.1 Multi-Regional Input-output (MRIO) database, which decomposes trade in goods and services into final and intermediate uses.

Then, we introduce long-term macroeconomic projections (GDP, labor participation rate and skills, current account, investment and saving rates, and energy efficiency) from updated results of a growth model known as the Macroeconometrics of the Global Economy (MaGE) (see Fouré et al, 2013 and Fontagné et al, 2022). Projections of fossil fuels prices (oil, gas and coal) from the U.S. Energy Information Administration (EIA) database are also considered.

In the first step to construct the BaU scenario, the total factor productivity (TFP) is endogenous to reconcile the two models (i.e. MIRAGE-VA and MaGE). The MIRAGE- VA model projects a reference trajectory of world economy which is consistent with the MaGE model. In the second step to construct the BaU scenario, we trade and climate policies are included, while keeping the TFP exogenous. Consequently, GDP, investment, and energy prices are endogenized.

The trade policy baseline includes the evolution of key trade policy changes that occurred between 2014 and 2019. These include the latest information on current FTAs, based on the 2014 and 2019 versions of the Market Access Map (MAcMap-HS6) databases (Guimbard et al., 2012). In particular, the entry into force of the Economic Partnership Agreements (EPAs) between the European Union (EU) and African countries (i.e. Cameroon, Cote d'Ivoire, Comoros, Madagascar, Mauritius, Seychelles, Zimbabwe, and SADC EPAs), as well as between the EU and Caribbean and Pacific regions are accounted for. until 2019. In addition, changes in the European generalized system of preferences (GSP) and GSP+ for other developing countries are integrated. Changes in the Chinese most-favored-nation (MFN) treatment and in the common external tariff (CET) set in 2015 by the Economic Community of West African States (ECOWAS) are also incorporated.

As for the climate policy, following Bellora & Fontagné (2023), the fulfilling of unconditional Nationally Determined Contributions (NDCs) of the COP27 are integrated in the baseline,¹³ but only for those countries with a national carbon market in place by 2021.¹⁴ We assume that these countries reach the commitments they have taken in the Paris Agreement by 2030, and that the emissions of these policy regions are thereafter capped at their 2030 level till 2045.

¹³ Climate policy baseline based on the updated NDCs from COP27 can be retrieved from the UNFCCC NDC Registration (<https://unfccc.int/NDCREG>).

¹⁴ These include Argentina, Canada, China, Colombia, EFTA, EU27, Japan, Korea, Mexico, New Zealand, Kazakhstan, UK, and Ukraine. South-Africa is excluded from the baseline, although there exists a national carbon market, the condition of its NDC is ambiguous.

The reference or BaU scenario in 2045 serves as the benchmark for comparisons with several simulations scenarios in relation to the implementation of the AfCFTA Agreement to evaluate the economic impact of the analyzed reforms (presented thereafter) in that same year.

5.3. Simulation scenarios

To simulate the implication of the AfCFTA Agreement on regional value chains, we consider four scenarios for the AfCFTA reform that vary in scope and ambition, as follows:¹⁵:

- **Scenario A:** Tariff liberalization alone. Tariffs are reduced within African countries in line with agreed AfCFTA modalities on trade in goods, from 2021 to 2035. Then the level tariffs remain unchanged to the 2035 level till 2045.
- **Scenario B:** Tariff liberalization (as under Scenario A) plus a 50% cut on actionable NTMs (within Africa) in the five AfCFTA priority services sectors (i.e. business, communication, financial, tourism and transport) as well as in health and education services (which have gains importance following Covid-19 crisis). The cut in services is performed linearly from 2021 to 2035. The level of NTMs in services reached in 2035 remains unchanged until 2045.
- **Scenario C:** Tariff liberalization plus a 50% cut on actionable NTMs in both services (as under Scenario B) and goods (within Africa). The NTMs in goods and services are cut linearly from 2021 to 2035, remaining constant thereafter and until 2045.
- **Scenario D:** Tariff liberalization (as under Scenario A) plus 100% cut on actionable NTMs in goods and services (within Africa). Again, the NTM cut is linear from 2021 to 2035, remaining constant until 2045.

Following a brief presentation of the global results based on the above four scenarios (Section 6.1), the rest of the analysis focuses exclusively on scenario C (section 6.2 and onwards), being the most realistic scenario to evaluate the implication of the AfCFTA Agreement's implementation on the development of Africa's RVCs.

6. Key findings on the implications of the AfCFTA Agreement's implementation on regional value chains in Africa

As discussed under section 2, a common measure for assessing a country or a region's integration into value chains involves examining forward and backward linkages. Backward linkages are the share of foreign value-added embodied in a country's exports. In other words, it corresponds to the process of an economy importing intermediates/inputs to produce intermediate or final goods and services to be exported. Forward linkages measure the share of the domestic value-added of a country which is

¹⁵ The same four scenarios have been simulated in earlier joint ECA and CEPII's assessments of the AfCFTA reform, with a different model, namely the Mirage-e model (see UNECA, 2021, Fontagné et al., 2022 b). Scenario C has also been performed in another joint ECA and CEPII's joint working paper, which uses the Mirage Power model (ECA-CEPII, 2024).

embodied in the exports of other countries. In other words, it corresponds to domestic value-added in intermediate goods and services exported to a partner economy that are further exported. However, due to the structure of the model and the structure of data, our results are not able to track and map the flows of value-added embodied in intermediate goods and services from one country/region to a third/fourth country/region, so as to precisely track the backward and forward linkages. Instead, our analysis will focus on intra-African and extra-African trade of intermediate and final goods and services, given the general value-added structure of the sectors.

It should also be noted that the modeled trade liberalization under the AfCFTA Agreement, which facilitates the movement of intermediate consumption across countries, further allows analyzing the change in intra-African intermediate goods and services. The latter helps capturing the potential creation of regional value chains. Finally, as the development of regional value chains is expected to impact value addition at sectoral level, our analysis will explore changes in sectoral value-added to assess the direction and magnitude of those effects.

6.1. Positive impact of AfCFTA on total African trade, with expected benefits for increased forward and backward participation of African countries in GVC

The implementation of the AfCFTA Agreement would reshape African trade in goods and services from the perspectives of both final and intermediate consumptions.

As shown in table 8, Africa is foreseen to continue importing and exporting relatively more intermediate goods and services than final goods and services, under the reference or BaU scenario without AfCFTA Agreement, in 2045. Final goods are usually regarded as products with relatively high value-added content and positioned at the end of a production chain, while intermediate goods exported by Africa typically encompass raw materials, natural resources with relatively low value-added content. From table 8, intermediate goods and services would account for as much as 83% (against 17% for final goods) of Africa's total exports, without AfCFTA, in 2045. On the imports side, although still in favor of intermediates, the gap between goods and services for intermediates and final consumptions is less pronounced; with intermediate goods and services accounting for 60% (against 40% for final goods and services) of Africa's total imports.

Following implementation of the AfCFTA Agreement, Africa's exports and imports would increase in goods and services for both intermediate and final consumption, under all the AfCFTA scenarios considered. Not surprisingly, the reduction of non-tariff measures in both goods and services (scenarios C) would amplify trade gains compared to tariff liberalization only (scenario A); the more ambitious the NTMs' cut the larger the impacts (scenario D versus C).

This being said, for the rest of the analysis we focus on scenario C which is seen as the most realistic based on information contained under the AfCFTA Agreement. Specifically, African exports of goods and services would increase by 17.0% (or USD 99 billion) for final consumption and by 5.2% (or USD 146 billion) for intermediate consumption, in 2045 and compared to a situation without AfCFTA.

Whereas accurately measuring Africa's contribution to GVCs remains challenging with the current indicators in the model, the impact on trade in goods and services suggests a positive impact of Africa's integration into GVC participation.

Indeed, while the increase in Africa's exports of goods and services for intermediate consumption will facilitate forward participation of African countries in GVCs, the strengthening of Africa's exports of goods and services for final consumption (admittedly from a lower base than for intermediate consumption), usually made up higher value-added content, is a particularly positive outcome following the implementation of the AfCFTA Agreement. Indeed, it is expected to facilitate the development of production chains and regional value chains in Africa.

Similarly, Africa's imports of goods and services will increase by 7.2% (or USD 100 billion) for final consumption and by 6.7% (or USD 145 billion) for intermediate consumption, in 2045 and compared to absence of AfCFTA. The meaningful increase in Africa's imports of goods and services for intermediate consumption intuitively align with the creating of regional value chains and the potential further integration in global value chain. Indeed, as intermediate goods and services are imported and subsequently used as inputs to the production chains, they will contribute to the reduction of production costs and enhance the competitiveness of the firms who make use of them. This will lead to an increased backward participation of African countries in GVCs (i.e. imports of goods and services for intermediate consumption to be used for exports of intermediate and final goods and services, as observed in our results).

Table 8: African exports and imports in BaU and variations under various AfCFTA scenarios (compared to BaU), 2045

	Reference (BaU) scenario (USD billion)	Scenario A	Scenario B	Scenario C	Scenario. D
Variations (%)					
African exports					
Goods and services for final consumption	583.5	5.6	5.9	17.0	34.1
Goods and services for intermediate consumption	2796.4	1.7	1.8	5.2	10.2
All goods and services	3380.9	2.4	2.5	7.3	14.3
African imports					
Goods and services for final consumption	1378.0	2.3	2.4	7.2	14.5
Goods and services for intermediate consumption	2150.6	2.3	2.4	6.7	13.0
All goods and services	3528.6	2.3	2.4	6.9	13.6

Source: Authors' calculations from simulations with MIRAGE-VA

As those increases in exports and imports of goods and services for final and intermediate consumption are measured as the sum of intra-Africa trade and African trade with rest of the world, we isolate the intra-African trade effects to analyze the possible outcomes on RVCs in next sub-section (6.2).

6.2. Enhanced regional value chains to be reflected through substantial increases in intra-African trade of goods and services for intermediate consumption

With the development of new regional value chains facilitated by trade, one would anticipate an increase in intra-regional trade of goods and services for intermediate consumption, considering that intermediates may move across several countries in the production chain. Consequently, two main outcomes can be expected: 1) An increase in total goods and services for final consumption exported from this region, as suggested in previous sub-section (see Table 8); 2) An increase in trade of goods and services for intermediate consumption within the region, with increased embodied value-added content.

Table 9 shows the expected changes in intra-African trade by sectors, following the implementation of the AfCFTA Agreement. Results indicate that the creation of regional value chains in Africa, as a result of the implementation of the AfCFTA Agreement, is expected in all main sectors, and particularly in agrifood, industry and services.

Firstly, we find a substantial increase (51.7%) in intra-African trade of industrial goods for intermediate consumption, surpassing the increase (43.6%) in intra-trade of industrial goods for final consumption. This implies an increase of intermediate flows among African countries which can contribute to the development of African regional value chains in the manufacturing sector.

Secondly, an important development of regional value chains in the agrifood sector can be anticipated following implementation of the AfCFTA Agreement. Indeed, intra-trade in agrifood sectors (processed and non-processed) increases substantially for both intermediate and final consumption. This can be attributed to the removal of relatively higher barriers for agricultural trade within Africa (see Table 5). Additionally, Africa exports a relatively small share of agrifood products for final consumption to rest of the world (see Table 7), thereby revealing that agrifood (processed and unprocessed) for final consumers produced in Africa is more likely to be traded within the continent. As a result, the rise in intra-African trade of agrifood for intermediate consumption is expected to contribute to the development of intra-African agrifood value chains, will in turn will also contribute to the an increase in intra-African agrifood trade for final consumption.

Thirdly, we observe a substantial increase of 40.4% in intra-African trade of services for intermediate consumption, while the increase in intra-African trade of services for final consumption is significant but inferior at 25.0%. This is consistent with a rise in the demand for intermediates in services (for example, transport services, financial services, and business services) to support the anticipated development of regional value chains in both manufacturing and processed food sectors. The level of increase of intermediate intra-trade in these sub-sectors in services are shown in table 11 in section 6.4.

Fourth, increase in intra-African trade of energy products for both final consumption and more importantly intermediate consumption following the implementation of the AfCFTA Agreement is

found to be more modest than in other sectors (except services for final consumption), with therefore relatively less potential for the creation of regional value chains in the energy sector.

Table 9: Intra-African trade in BaU and variations following implementation of the AfCFTA Agreement (compared to BaU), in USD billion and %, 2045

		Reference (BaU) scenario (USD billion)	Variation USD billion %	
Agrifood (non-processed)	Final consumption	18.4	16.6	90.0
	Intermediate consumption	16.7	8.3	49.6
Agrifood (processed)	Final consumption	46.4	25.8	55.5
	Intermediate consumption	16.8	8.0	47.6
Industrial goods	Final consumption	146.1	63.7	43.6
	Intermediate consumption	197.0	101.9	51.7
Energy goods	Final consumption	6.6	2.0	30.0
	Intermediate consumption	156.8	44.6	28.4
Services	Final consumption	6.2	1.6	25.0
	Intermediate consumption	8.3	3.4	40.4
Total goods and services	Final consumption	223.8	109.6	49.0
	Intermediate consumption	395.6	166.1	42.0
	All consumption types combined	619.4	275.7	44.5

Source: Authors' calculations from simulations with MIRAGE-VA

6.3. Narrowing down on the sectoral decomposition of intra-African trade by intermediate and final consumption confirms the strong potential for Africa's regional value chain development, particularly in agrifood and industrial sectors

In 2045 without AfCFTA, the industry and agrifood sectors are the two most important sectors for intra-Africa trade for final consumption, together accounting for 95% of intra-African trade for final goods and services. Turning to intra-African trade for intermediate consumption, industry and energy sectors are the two dominant sectors, together accounting for over 85% of the intra-African trade for intermediate goods and services.

As mentioned in section 6.2, the implementation of the AfCFTA Agreement would boost the volume of intra-African trade in goods and services for both final and intermediate consumptions, with intra-African trade in goods and services for intermediate consumption holding greater significance for the creation of African regional value chains. Focusing on a comparison of the sectoral shares of intra-

African trade for intermediate consumption between the baseline and AfCFTA scenario in 2045, the results are unequivocal. Results shows that implementing the AfCFTA Agreement would substantially rise the share of intra-African trade in industry for intermediate consumption (to 53.2%), in 2045 and compared to absence of AfCFTA (at 49.8%). The share of intra-African trade in agrifood (processed and non-processed) for intermediate consumption would also increase, although in lower proportion (to 8.9% with AfCFTA against 8.4% without AfCFTA). The share of intra-African trade in services sectors would remain unchanged (2.1% with or without AfCFTA), whereas the share of intra-African trade in energy would fall (to 35.8% with AfCFTA from 39.6% without AfCFTA). This confirms the greater potential for creation of regional value chains in industrial and agrifood sectors in Africa.

Concerning the intra-African trade of final goods, we find that final agrifood would trade more within the continent. This can be attributed to the fact that Africa exports small share of final agrifood to rest of the world, as the majority of the final agricultural goods are consumed within the continent. As a result, the creation of value chains in agrifood sector is anticipated to largely promote the final consumption in the same sector.

Table 10: Decomposition of intra-African trade by main sectors, for final and intermediate consumption, without vs. with AfCFTA, 2045

	Without AfCFTA	With AfCFTA
Final consumption		
Agrifood (non-processed)	8.2%	10.5%
Agrifood (processed)	20.8%	21.7%
Industry	65.3%	62.9%
Energy	2.9%	2.6%
Services	2.8%	2.3%
Intermediate consumption		
Agrifood (non-processed)	4.2%	4.5%
Agrifood (processed)	4.2%	4.4%
Industry	49.8%	53.2%
Energy	39.6%	35.8%
Services	2.1%	2.1%

Source: Authors' calculations based on simulations from MIRAGE-VA

6.4. Processed food, automotive, pharma and chemicals, wood and paper, metals, tourism, communication and health: the most promising sub-sectors for regional value chains development in AfCFTA context

Breaking down the anticipated changes (following AfCFTA Agreement's implementation) in intra-African trade of intermediate goods and services by sub-sectors, show considerable increases in most sub-sectors, albeit from a relatively small basis in many cases (see Table 11 column 3 and 4).

However, even as increases in intra-African trade of goods and services for intermediate consumption are useful indications of the potential for the development of regional value chains in Africa, the creation of value-added in the relevant sectors/sub-sectors is key. Value-added measures the increased value of a product by accounting factor inputs such as labor, capital and/or land, excluding

the cost of intermediate inputs. It represents the sum of the incomes from the relevant factors. Increased value-added is expected with the creation of regional value chains, since intermediate inputs move across countries along the production chain. At each stage of the production chain, there should be an increase in value-added for final or intermediate products. Moreover, reducing cost to intra-regional trade is anticipated to facilitate access to more diversified suppliers of intermediate goods at a lower cost, which ultimately increases the competitiveness of exports.

Implementation of the AfCFTA Agreement is expected to lead to both increase in intra-African trade for intermediate consumption and positive value-added variations of 0.87%, 0.74%, 0.23% and 0.14% in processed agrifood, industry, energy and mining sectors and services respectively, in 2045 and compared to absence of AfCFTA.

Narrowing down on the sub-sectors, within the industry those sectors such as wood and paper, automotive, chemicals and pharma, metals, and other manufacturing (computer electronic products, electrical equipment, machinery and equipment) are the ones to contribute the most to the creation of African value-added, with also substantial increases in intra-African trade for intermediate consumption, following the implementation of the AfCFTA Agreement. Dairy products, sugar, meat, and other food and beverages would contribute positively to value addition in agriculture. Tourism, communication and health show the best potential for value addition within services sectors, whereas electricity and refined oil would be the only sectors with a positive contribution to value-added within the energy sector. Those sub-sectors with expected increases in both intra-African trade for intermediate consumption and value-added, thereby display the greatest potential for RVC creation in AfCFTA context.

Conversely, those sub-sectors displaying decreases in Africa’s value-added (even as intra-African trade for intermediate consumption may increase) appear to offer relatively lower potential for the development of regional value chains on the Continent, following the implementation of the AfCFTA Agreement. For instance, most non-processed agricultural products are directly used for final consumption without any value chain supposed to be created during this process. In the case non-processed agricultural products are subject to be used for intermediate consumption, during this first stage it will be transformed into processed agrifood and labelled as processed agrifood in either the next stage of production chain or final consumption, and thus no accumulation of value-added will be accounted for non-processed agrifood. As a result, it should not appear surprising that while regional value chains are expected to be built in the processed agrifood sector, there is no increase of value-added for most non-processed agrifood sectors.¹⁶ A similar argument applies to most of the products under the energy sector, where we observe a decrease of value-added in oil, mining, gas and coal sectors, and these are primary products with low value-added. On the contrary, for refined oil which is a secondary product, a substantial increase in value-added is foreseen.

Table 11: Change in intra-African trade in intermediate goods and services, along change in value-added, by sub-sectors, following the implementation of the AfCFTA Agreement, as compared to baseline (i.e. without AfCFTA), %, 2045

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	Value Added		Intra-African trade for intermediate consumption	
	Without AfCFTA in 2045 USD Bn, 2014 prices	Variation (%) with AfCFTA	Without AfCFTA in 2045 USD Bn, 2014 prices	Variation (%) with AfCFTA
Total Agriculture and food	1054	-0,09	49,8	48,6
Agrifood (non-processed)				
Vegetables fruit nuts	316	-0,82	5,3	27,6
Other cereals and crops	175	-0,11	8,3	27,1
Meat	160	0,18	0,8	98,6
Livestock	103	-0,46	3,1	46,8
Milk and dairy products	66	1,08	1,3	181,1
Sugar	44	0,44	6,0	106,5
Paddy and processed rice	23	-1,17	0,2	31,3
Processed food				
Other food and beverages	167	0,87	24,8	47,6
Industry	808	0,74	298,9	51,7
Metals	149	0,93	116,8	46,8
Other manufacture products	136	0,46	24,6	53,4
Vehicles and transport equipment	127	1,08	13,2	85,2
Chemical rubber plastic pharma	126	1,04	90,1	47,8
Textile wearing apparel and leather	113	-0,66	10,8	44,1
Forestry	92	-0,12	3,1	10,4
Wood paper plastic and chemicals	64	3,49	40,3	75,6
Energy and mining	797	0,23	201,4	28,4
Oil	271	-0,37	39,1	9,0
Electricity	223	1,45	34,2	25,6
Mining	193	-0,45	70,9	45,1
Gas	64	-0,45	4,3	-0,4
Refined Oil	31	3,58	48,7	32,2
Coal	15	-1,99	4,2	14,5
Services	4606	0,14	11,7	40,4
Other services	2840	0,30	1,9	-1,5
Health	392	0,12	0,3	32,3
Communication	286	0,02	0,3	0,2
Business services	246	-0,27	4,3	68,5
Financial services	229	-0,12	0,4	106,7
Transport	219	-0,48	1,7	45,2
Education	201	-0,37	1,1	33,3
Tourism	147	0,24	0,1	52,7

Source : Authors' calculations based on simulations from MIRAGE-VA. Note that due to the constraint of aggregation, meat, milk and dairy products, sugar, paddy and processed rice are actually a sum of processed and non-processed products. We classify them as unprocessed Agrifood goods.

It should however be noted that for a strategic sub-sector like textile, wearing apparel, and leather, even as value-added wouldn't increase for Africa as a whole,¹⁷ many countries (including Benin, Cote d'Ivoire, Ghana, Mauritius, Namibia, Rwanda, Tanzania and groupings such as rest of ECOWAS, rest of North Africa, Rest of TFTA) would register significant increases in intra-African trade for intermediate consumption in the sub-sector along with increases in value-added. Thus, the potential for development of RVCs in textile, wearing apparel and leather in a fair number of African countries in AfCFTA context.

In turn, the findings support one of the key goals of the AfCFTA, which is to promote the industrial transformation of the African continent. Indeed, results are highly supportive of the enhancement of regional value chains in the processed agrifood and manufacturing sectors in the context of the implementation of the AfCFTA Agreement. In fact, our findings support the potential of RVC creation in the priority sub-sectors identified in the AfCFTA process such as agribusiness, automotive and pharma, along with other sub-sectors deserving special attention for RVC development in AfCFTA context.

7. Conclusion

The main objective of this study is to explore how the implementation of the AfCFTA Agreement may provide opportunities to strengthen value chains within Africa.

In that sense, an analysis of Africa's current participation to backward and forward linkages in GVC, in light of a country's development and income, is performed and reveals that Africa's participation in GVC is limited. Notably, while the continent increasingly participates in GVC by exporting goods further transformed by other countries (i.e. forward participation), its participation to backward linkages which is assessed to be the most effective for income generation and GVC participation remains weak.

Putting the objectives of the AfCFTA Agreement in perspective with Africa's current tariffs, non-tariff measures and trade structures, the potential for the creation of regional value chains exists. It is clear that Africa's exports to the rest of world predominantly consist of intermediate goods, particularly energy and mining products with limited value-added content and which face relatively low tariffs and non-tariff barriers. At the same time, Africa's imports from the rest of the world mainly comprise industrial goods, which are usually considered of relatively higher value-added content. This picture nonetheless contrasts with the composition of intra-African trade and existing trade barriers within the Continent. Indeed, the industrial content of intra-African trade is significant but remaining tariffs

¹⁷ The overall result for textile is mainly driven by a decrease in Egypt, whose has a dominant share in the total textile sector in Africa.

and NTMs on industrial products and more broadly other goods within Africa tend to be relatively higher than those imposed by Africa to the rest of the world. This can be seen as a factor undermining the development of regional value chains. Therefore, the AfCFTA must and can play a key role (through the liberalization of tariffs and NTMs within the continent) in facilitating intra-African imports of industrial and other goods for value addition and regional value chains development in Africa.

The potential from the implementation of the AfCFTA Agreement to foster regional value chains in Africa is further assessed by the empirical analysis based on CGE modeling. First, implementing the AfCFTA Agreement will not only positively impact Africa's total trade. It will also increase Africa's imports of goods and services for intermediate consumption and Africa's exports of goods services for final consumption, with expected benefits for increased backward and forward participation of African countries in GVC. Second, the impact of the AfCFTA Agreement's implementation on regional value chains will primarily come from the relatively higher increases in intra-African trade of industrial goods and agrifood, facilitated by increased intra-African trade of services, for intermediate consumption. As a result, the creation of regional value chains in agrifood and industrial sector is anticipated to further promote intra-African trade for final consumption in those sectors. Third, the sub-sectors showing the greatest potential for value added and the development of regional value chains in Africa include: wood and paper, automotive, chemicals and pharma, metals, and other manufacturing (i.e. computer electronic products, electrical equipment, machinery and equipment) as well as textile, wearing apparel and leather in most African countries (within industry), dairy products, sugar, meat, other processed food and beverage (within agriculture), tourism, communication and health (within services) and even electricity and refined oil (within energy). In other words, our analysis not only confirms the importance of priority sub-sectors for value chains development identified in the AfCFTA process, such agribusiness, pharma and automotive but also of other sub-sectors. It should nonetheless be acknowledged that the assessed benefits from this analysis may be underestimated due to not considering the AfCFTA Agreement in its entirety (for instance, leaving out the issues relating to investment, intellectual property rights, competition policy or digital trade) and the challenges to precisely measures value chains development. Notwithstanding, the results suggesting that the implementation of the AfCFTA is poised to contribute to the industrial transformation of the African continent through the creation and enhancement of African region value chains, particularly in industrial and agrifood sectors, should not be overlooked. Obviously, moving forward, effective implementation of the AfCFTA Agreement remains key for such outcomes to materialize.

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Table A1. Sectoral aggregation

MIRAGE sector	Aggregated sector code	Global sector code	Trade	Analysis	Project
Business services	bus	obs			
Other cereals and crops	cec	wht, gro, osd, pfb, ocr			
Chemical, rubber, plastic, pharma	chp	chm, bph, rpp			
Coal	coal	coa			
Communication	com	cmn			
Milk and dairy products	dpd	rmk, mil			
Education	edu	edu			
Mining	ext	oxt, nmm			
Financial services	fin	ofi			
Forestry and fishing	frs	frs			
Forestry and fishing	fsh	fsh			
Gas	gas	gas, gdt			
Health	hea	hht			
International transport	inttrp	wtp, atp			
Livestock	lvs	ctl, oap, wol			
Meat	meat	cmt, omt			
Metals	met	i_s, nfm, fmp	-		
Other food and beverages	ofdb	vol, ofd, b_t		-	
Oil	oil	oil			
Other manufactured products	oma	ele, eeq, ome, omf			
Other services	ose	wtr, cns, trd, whs, ins, rsa, ros, osg, dwe			
Power	power	ely			
Refined oil	refinedoil	P_c	-		
Paddy and processed rice	ric	pdr, pcr			
Sugar	sug	c_b, sgr	-		
Textiles, wearing apparel and leather	tal	tex, wap, lea			
Tourism	trm	afs			
Transport	trp	otp			
Vegetables, fruit and nuts	vfn	v_f	-		
Vehicles and transport equipment	vtp	mvh, otn			
Wood, paper, plastic and chemicals	wop	lum, pp			

Table A2. Regional aggregation

MIRAGE region	Aggregated region code	Global Trade Analysis Project region code
Benin	Benin	BEN
Cameroon	Cameroon	CMR
China	China	CHN
Côte d'Ivoire	CoteIv	CIV
Egypt	Egypt	EGY
Ethiopia	Ethiopia	ETH
EU27_UK	EUUK	AUT, BEL, CYP, CZE, DNK, EST, FIN, FRA, DEU, GRC, HUN, IRL, ITA, LVA, LTU, LUX, MLT, NLD, POL, PRT, SVK, SVN, ESP, SWE, GBR, BGR, HRV, ROU
Ghana	Ghana	GHA
Kenya	Kenya	KEN
Mauritius	Mauritius	MUS
Morocco	Morocco	MAR
Mozambique	Mozam	MOZ
Namibia	Namibia	NAM
Nigeria	Nigeria	NGA
Rest of North Africa	RoAMU	TUN, XNF
Rest of the Economic Community of Central African States	RoECCAS	XCF
Rest of Economic Community of West African States	RoECOWAS	BFA, GIN, TGO, XWF
Rest of the Tripartite Free Trade Area	RoTFTA	XAC, MDG, MWI, SDN, ZMB, XEC, BWA, XSC
Rest of the world, absolute	ROW_abs	AUS, NZL, JPN, CAN, ARG, BRA, ECU, CRI, GTM, CHE, NOR, BLR, UKR, XEE, KAZ, TJK, AZE, ISR
Rest of the world, business as usual scenario, absolute	ROW_bau	KOR, MNG, IDN, THA, VNM, BGD, LKA, MEX, COL, PRY, PER, JAM, ALB, KGZ, GEO, IRN, JOR
Rest of the world, others	ROW_oth	XOC, HKG, TWN, XEA, BRN, KHM, LAO, PHL, XSE, IND, NPL, PAK, XSA, XNA, BOL, URY, VEN, XSM, HND, NIC, PAN, SLV, XCA, DOM, PRI, TTO, XCB, SRB, XEF, RUS, XER, XSU, ARM, BHR, IRQ, KWT, LBN, OMN, PSE, QAT, SAU, TUR, SYR, ARE, XWS, XTW, MYS, SGP, CHL
Rwanda	Rwanda	RWA
Senegal	Senegal	SEN
South Africa	Sthafrika	ZAF
Tanzania	Tanzania	TZA
Uganda	Uganda	UGA
United States	USA	USA
Zimbabwe	Zimbabwe	ZWE