

The Impact of African Continental Free Trade Area (AfCFTA) Implementation on Ethiopian Economy

***Mussie Mindaye¹**

Associate Prof. Carlo Migliardo²

Associate Prof. Tadele Ferede³

¹ University of Messina, Italy, and Visting Scholar at Southern Illinois University, USA

² University of Messina, Italy

³ University of Addis Ababa, Ethiopia

Abstract

Africa has commonly been an economically fractured market with limited trade integration in various corners of the continent and a low level of intra-regional trade among the countries. In 2021, intra-African trade within the continent accounted for only 14% or nearly 71 billion USD. In response to Africa's low level of economic integration, on March 21, 2018, African leaders signed the African Continental Free Trade Area (AfCFTA) in Rwanda. Apart from Eritrea, all 54 African countries have signed the agreement, and 46 countries have ratified it.

This study investigated the impact of the African Continental Free Trade Area (AfCFTA) implementation on Ethiopia's trade performance. The research utilized a computable general equilibrium (CGE) model using the Global Trade Policy Analysis Project (GTAP) framework. The model was designed to simulate situations involving the reduction of tariff and non-tariff barriers.

The main findings of the analysis showed an increase in GDP and welfare gains; the price of imports and government revenue declined; and the price of exports was mixed, with an increase in agriculture in the early years of liberalization and a decrease in industrial products. The quantity of imports is rising for all products except light and heavy manufacturing. On the other hand, the quantity of exports in manufacturing is increasing, but not in the agricultural sector. Furthermore, trade creation occurs in all sectors, except in the extraction sector. The trade diversion has tiny results. While the impact of perfect and imperfect competition markets is alike, the influence of perfect competition is more pronounced.

Keywords: CGE model, AfCFTA, Reduction of Tariff and Non-Tariff barriers, Ethiopia

1. Background

Africa has commonly been an economically fractured market with limited trade integration in various corners of the continent and a low level of intra-regional trade among the countries. In 2021, intra-African trade within the continent accounted for only 14%, or nearly 71 billion USD (Trade Law Centre, 2022). This is in stark contrast to other continents. For instance, in the European Union, trade within the region represented over 38% of overall trade (Eurostat, 2022). Similarly, the share of intra-Asian trade in the Southeast Asian Nations Regional Integration reached 21.3% (ASEAN key figures, 2022). The South American Common Market, which includes Argentina, Brazil, Paraguay, Uruguay, and Venezuela, accounts for around 11% of their total trade (Global Edge, 2022), becoming the closest to Africa's intra-continental trade patterns. Despite numerous initiatives to increase intra-trade between African countries since the founding of the Organization of African Unity (OAU), the potential for intra-continental trade has not been fully utilized.

In response to Africa's low level of economic integration, the African Union endorsed the African Continental Free Trade Area (AfCFTA) at an extraordinary assembly meeting of the respective heads of state and government convened in Kigali, Rwanda, on March 21, 2018 (AfCFTA Secretariat report, 2022). Once it is in place by all the African countries, the AfCFTA will serve as a comprehensive trade agreement across the continent with an ambitious and extensive agenda designed to encourage sustainable socio-economic development, diversify economies, enhance regional integration via value chains, and improve global market competitiveness. Furthermore, it seeks to tackle the issues arising from overlapping regional economic communities, aid the shift from an agrarian to an industrial economy, and accelerate industrialization by leveraging economies of scale through access to a continent-wide market.

The literature suggests that participation in multilateral, regional, or continental integration can influence consumers, producers, employment, welfare, market prices and outputs, and tax income. Consequently, the cumulative effect of these factors shapes the overall economic impact of trade integration.

At present, becoming part of the global trading system, such as the World Trade Organization (WTO), and regional integration, which is equally significant, are considered essential worldwide. As a result, most countries (166 in total) have been WTO members since 1995, and their combined share of global GDP has risen to 98%. Furthermore, the

WTO Report (2023) states that 593 regional FTA agreements were signed, with 360 of them already in effect.

The primary objective of this study is to assess the impact of the African Continental Free Area (AfCFTA) implementation on the Ethiopian economy. The rationale for choosing Ethiopia as the subject of this analysis is for three main reasons: first, it is a founding member of the AfCFTA; second, the implementation of the AfCFTA is anticipated to bring about economic changes by harnessing the countries' abundant resources and unlocking significant markets. Third, Ethiopia's experience with such systems is limited, as it is not currently part of any continental or regional free trade area structure. Therefore, the study presents the potential economic impact of the AfCFTA on Ethiopian economic performance indicators and aids in analyzing the extent of the shifts in output, prices, welfare, and government revenue.

In connection with the research conducted, the Economic Commission for Africa (2022), Jansen and Sandrey (2015), Mureverwi (2016), and Saygili et al. (2018) studied how the AfCFTA would affect African nations with 100% tariff liberalization for all products. None of these studies consider the tariff offers at the country level that distinguish between sensitive and non-sensitive goods and the state parties' progressive liberalization specifically for the Ethiopian case.

The research contributes by analyzing products from the Ethiopia Goods offer that are sensitive and non-sensitive, accounting for both perfect and imperfect competition. The study intends to ascertain the effects of the AfCFTA (gains or losses) on Ethiopia's economy and to pinpoint which sector will be most impacted once Ethiopia eliminates tariff and non-tariff barriers. The study utilized a multi-sector and country-computable general equilibrium model, developed by the Global Trade Policy Analysis, to account for the interplay among various African countries.

The six-part study concentrates on the impact of the implementation of the African Continental Free Trade Area (AfCFTA) on Ethiopia's economy. Part 2 describes the outline of the AfCFTA agreement. Part 3 discusses Ethiopia's economic performance and its trading relationships with other African countries. Part 4 explains the theoretical foundation. Part 5 provides a detailed description of the data and methodologies used. Part 6 presents the results for Ethiopia, including welfare, price, output, and the effects on trade creation and diversion with the partner countries. The study concludes with policy advice in the final part.

2. A brief overview of the African Continental Free Trade Area (AfCFTA)

The African Leaders affirmed the gradual maturation of the community for the African economy in 2028 in Nigeria's capital city of Abuja in 1991. Out of the six stages of integration suggested by the Treaty, the establishment of the African Continental Free Trade Area (AfCFTA) was referred to as the third phase. Although there are variations among different regions of Africa, this arrangement, which began to be implemented in 1994, lays out a vision and program for a six-stage level of economic integration within Africa, starting with strengthening the regional economic countries in various parts of the continent and throughout the process to the building of the Economic Community in Africa for the achievement of a continent-wide economic space by enhancing regional value chains and increasing global trade. While the economic integration program as laid out in the Treaty has not been fully achieved based on the schedule, the African Union member state leaders decided in 2012 to boost trade between African countries and advance the Free Trade Area formulation at the continental level in the spirit of Pan-Africanism by setting an indicative date of 2017. This African Leaders' Decision is intended to extend sustainable and predictable market access, using trade as a tool for the achievement of prompt social and the development of the African economy and solidifying the political ties (Africa Trade Report, 2018).

Beginning in January 2021, all African countries covered by the African Union (AU) Framework were subject to liberalization. Apart from Eritrea, 54 African countries have signed the Agreement to date. On February 1, 2024, 47 countries ratified the AfCFTA agreement. Consequently, on July 7, 2019, the summit's decision to enact the African Continental Free Trade Agreement (AfCFTA), which includes protocols on goods and services, a framework for institutions, and a dispute resolution system, took effect. Moreover, trade-related areas, including investment facilitation, disciplines of trade competition and consumer protection, and preserving the owner's right to intellectual property, were agreed upon and approved by the member states in February 2023. In addition, phase three negotiations have been conducted on e-commerce.

The tariff liberalization modalities reflect those agreed upon by African Union countries and call for an applied rate reduction for 90% of the tariff line to be liberalized within five consecutive years for 22 developing African economies and within ten consecutive years for 33 least developed African countries (LDCs) using a linear approach. The 7% tariff line

reduction of the applied rate could be designated as "sensitive" and hence slated to be liberalized over an extended period; this means the liberalization will start after five years, which would be complete within 10 years for developing African economies and 13 years in total to liberalize the 97% for least developed African countries; and that an additional 3% of tariff lines excluded from liberalization take into account the value of imports within African countries about the average of 3 years trade data subject to a five-year reviewing period (UNCTAD Report, 2020). The tariff elimination also includes the gradual elimination of other duties and taxes, including surtaxes and community levies in various regional economic integration. Border taxes that apply to locally produced goods are domestic taxes and are not subject to AfCFTA obligations.

On the other hand, the AfCFTA agreement cushioned non-tariff barriers (NTBs) with a legal framework in the Protocol on Goods and introduced the online NTB monitoring and reporting portal. The ITC Report (2021) asserts that non-tariff barriers (NTBs) would affect trade actors much more than customs duties. The gains from tariff reductions could be dwarfed by the imposition of NTBs and increasing regulatory obligations. Hence, the Multilateral and Regional Agreement has indicated various provisions to ease compliance with import and export procedures for businesses. Therefore, the country that harmonizes and automates import and export procedures to minimize the costs for traders faces complying with the requirements. The trade measures can include coordination and automation of border operations, enhancing transparency and predictability, and avoiding bureaucratic inefficiencies while vigilantly ensuring that trade adheres to sound public policy agendas. The AfCFTA significant impact is also likely to be considerably bigger if non-tariff measures are properly addressed, illegal traders are absorbed into legal channels, and the development of a competitive services sector is also essential to improving trade performance.

Although the AfCFTA offers significant advantages for achieving economic growth through trade liberalization, there are still issues and uncertainties for the parties. Key obstacles to the integration of the continent are the potential for significant revenue losses because of the elimination of tariffs and an unequal distribution among the member states because of the degree of industrialization. While Least Developed African Countries may endure a significant drop in import tax revenue and pressure on domestic infant industries, countries with massive manufacturing facilities may benefit from the arrangement (UNECA, 2019). If adequate flanking measures and flexibilities that permit the relocation of opportunities and

reasonable sharing of losses by state parties are not put in place to member states, an uneven distribution of gains and losses among African states may prolong negotiations, especially on Rule of Origin matters, and delay its implementation.

3. Ethiopian Context

3.1 Macroeconomic Performance

The Ethiopian economy has continued to grow by 6.1% in real terms in 2021. This Real GDP growth was larger than the average growth for Sub-Saharan Africa which is 4.7% (World Economic Outlook update, October 2022).

In 2021, agriculture comprised 32% of Ethiopia's GDP. Within the agricultural sector, 65.6% is composed of the production of crops; animal farming and hunting contribute to 25.6%; and forestry accounts for 8.5%. Industries constituted 28.5% of the country's GDP, mainly the construction industry, including highways, railroads, dams, and residential buildings, which accounted for 72.2%; the manufacturing sector constituted 23.4% of the industry sector, whereas mining, electricity, and water accounted for 1.8% and 2.7% of the sector's output, respectively. While the services sector comprised 39.5% of the economy, it included the wholesale and retail trade (36.4%), hotel and restaurant (6.1%), transportation and communications (13.8%), real estate, renting, and business activities (11.5%), public administration and defense (10.4%), and others like financial intermediation, education, and health (21.8%) (NBE, 2022).

The continuous rise in GDP is contributing to improvements in the reduction of poverty across the entire country. According to World Bank research from 2022, the percentage of the population living below the national poverty line⁴ dropped from 30% in 2011 to 27% in 2019, and measures of human development also improved. However, Ethiopia is among the low-income countries with a per capita gross national income of \$960, and inequality has increased in recent years (World Bank report, 2022).

A labor survey conducted in 2022 indicated a total of 1,920,314 unemployed people countrywide, along with a national unemployment rate for urban areas of 18.9%. Males constituted 557,083 persons, or 29%, while females comprised 1,363,231 persons, or 71.0% of the unemployed persons respectively (Labour Survey report, 2022).

⁴ The national poverty line, which is now 2.15 USD a day since September 2022, is the proportion of the population that falls below the overall poverty level(s) established by the World Bank. Surveys of households collect data about patterns.

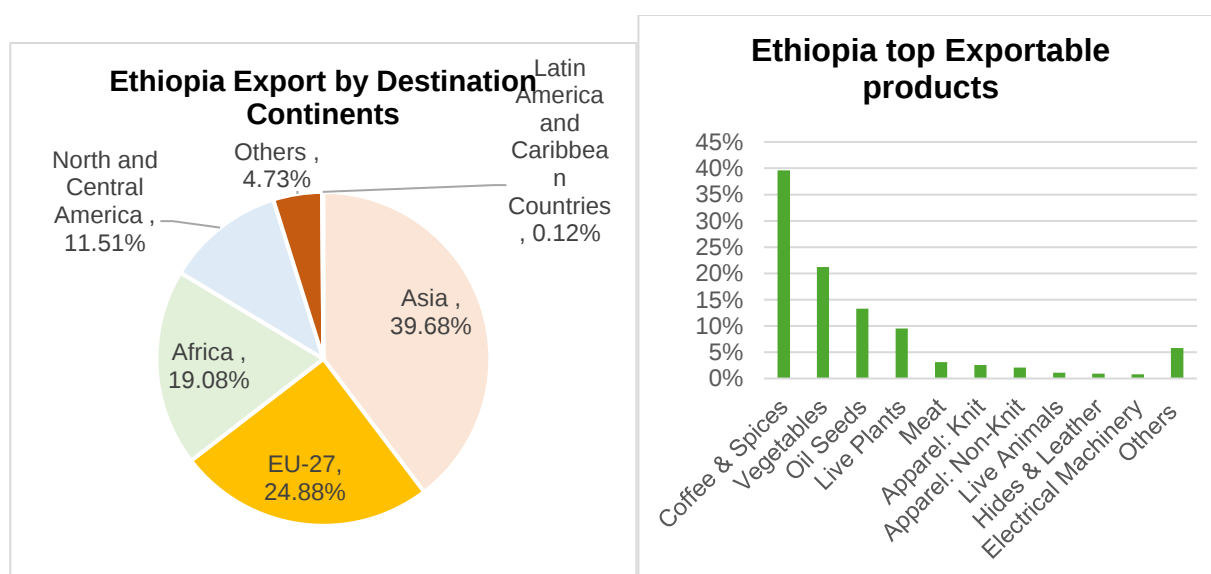
3.2 External Trade Composition and Direction

3.2.1 Global Trade Pattern in the Ethiopian Context

The trade sector in Ethiopia has not been as vibrant as its other African competitors. Mainly primary agricultural products take the lion's share, while in the merchandise trade, quantities of imports compared with exports have remained high relative to several trading partners, resulting in around 11 billion trade deficits.

Regarding the destination, the market for Ethiopian exportable products has increased over time and reached 147 countries in 2021 (WITS, 2022). And indeed, 30 countries take in more than 90.2% of the country's exports. Ethiopia's merchandise exports were \$3.95 billion, but the product mix was not intensified; 94% of the items are the top ten products and coffee covers one-third of the exports. In 2021, Asia became the main export destination (39.68%), followed by Europe-27 (24.88%) and Africa (19.08%). The country's exports to North and Central America and Latin and Caribbean countries accounted for 11.51% and 0.12%, respectively (Global Edge, 2023).

Figure 1. Ethiopia Export by Destination and Products, 2021

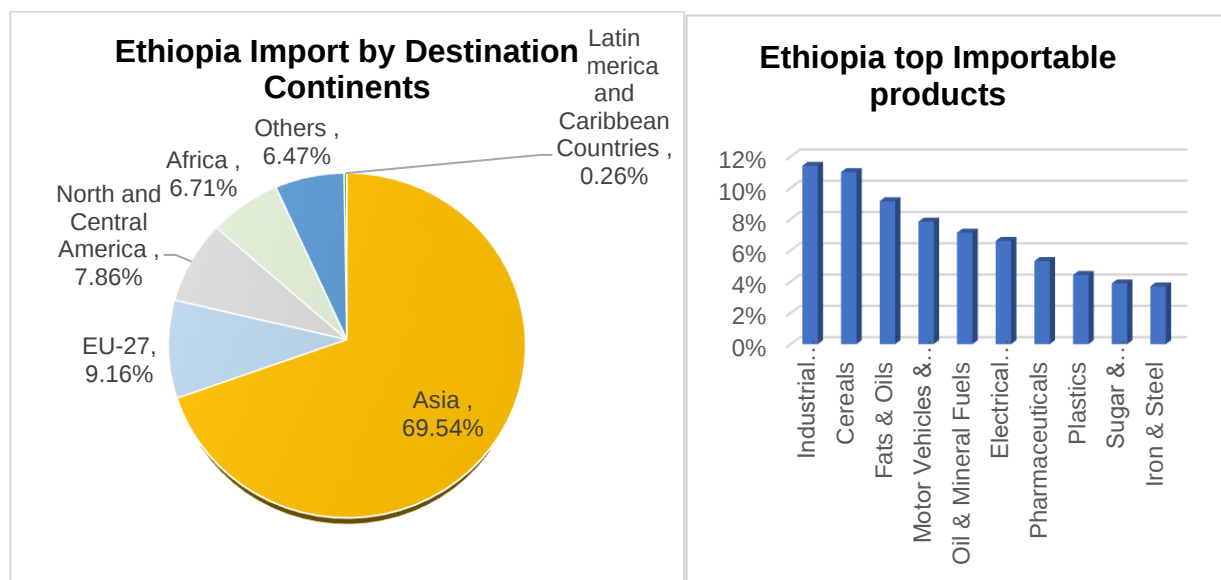


Source: Own calculations based on Global Edge, 2023

The import products of Ethiopia reached USD 15.28 billion in 2021, even though the demand is much bigger than this amount. As outlined in the graph below the huge import of Ethiopia originated from Asia (69.74%) followed by Europe-27 (9.16%), African (6.71%), and North and Central America countries (7.86 %). The top ten imported products account for almost 70% of the country's total imports. Those items include not only industrial

products but also food items. Specifically, the industrial and electric machines that are inputs for the industries together with cereals, edible oil, and sugar for daily consumption are tariff-free.

Figure 2. Ethiopia Import by Destination and Products, 2021



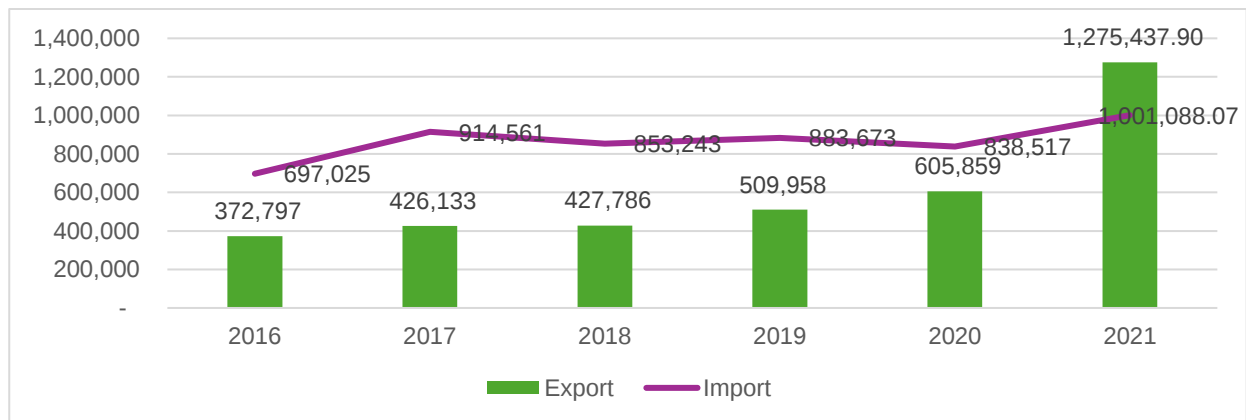
Source: Own calculations based on Global Edge, 2023

3.2.2 Ethiopia's trade performance towards Africa countries

Ethiopia's trade share with African countries is very low compared with its share of global total trade. Based on UNCTAD data (2023), Ethiopia's exports of goods to the region represented on average only 19.6% of Ethiopia's exports to the world from 2016 to 2021, while imports from the region accounted for about 5.5% of Ethiopia's imports between 2016 and 2021.

In the aforementioned years, Ethiopia traded goods worth roughly, on average, 602.9 million US dollars exported annually with the continent of Africa while getting in roughly 864.7 million US dollars imported. This suggests a deficit in regional goods trade of a little under \$261 million, although the deficit has been shrinking over the last three years, and we even noticed a positive trade balance in 2021 (UNCTAD, 2023). Due to the expansion of the industrial sector in Ethiopia, committing to the AfCFTA agreement may have a possible effect given Ethiopia's favorable trade balance with African countries.

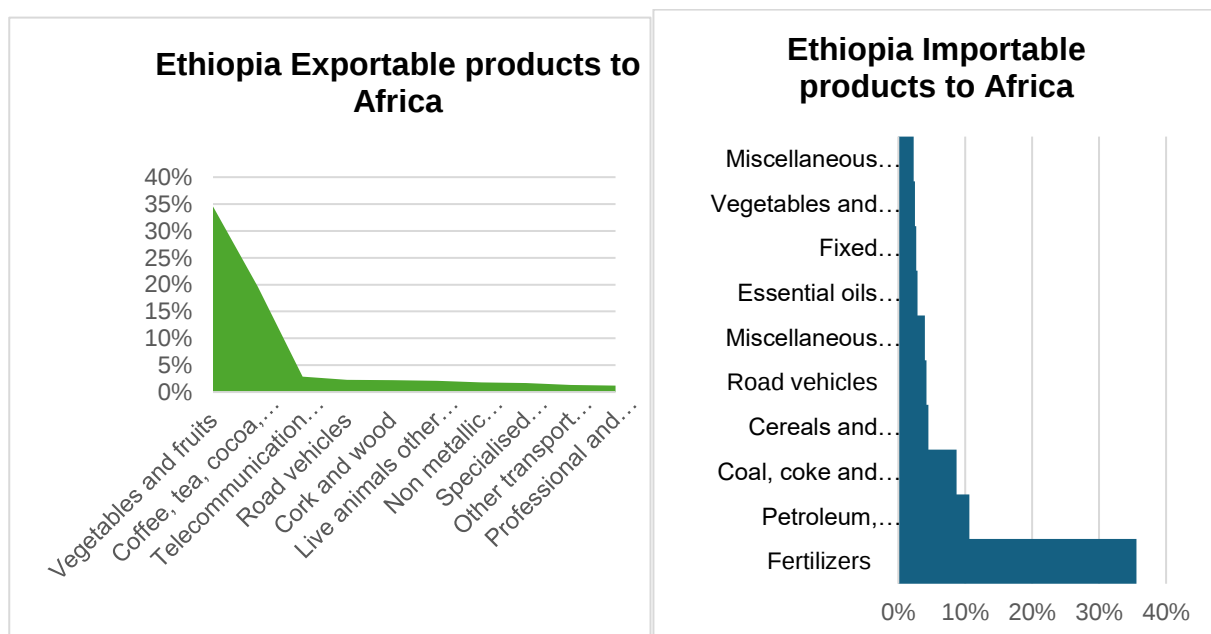
Figure 3. Ethiopia Export and Import to Africa in Thousand USD (2016-2021)



Source: Author's computations based on UNCTAD, 2023

In terms of commodities, Ethiopia's main exports to the region are vegetables and fruits (35% of its total exports of goods to the region from 2016 to 2021 on average); its main imports are fertilizers and petroleum (together, about 47% of its imports of goods from the region from 2016 to 2021 on average).

Figure 4. Ethiopia's Top Exportable and Importable Products

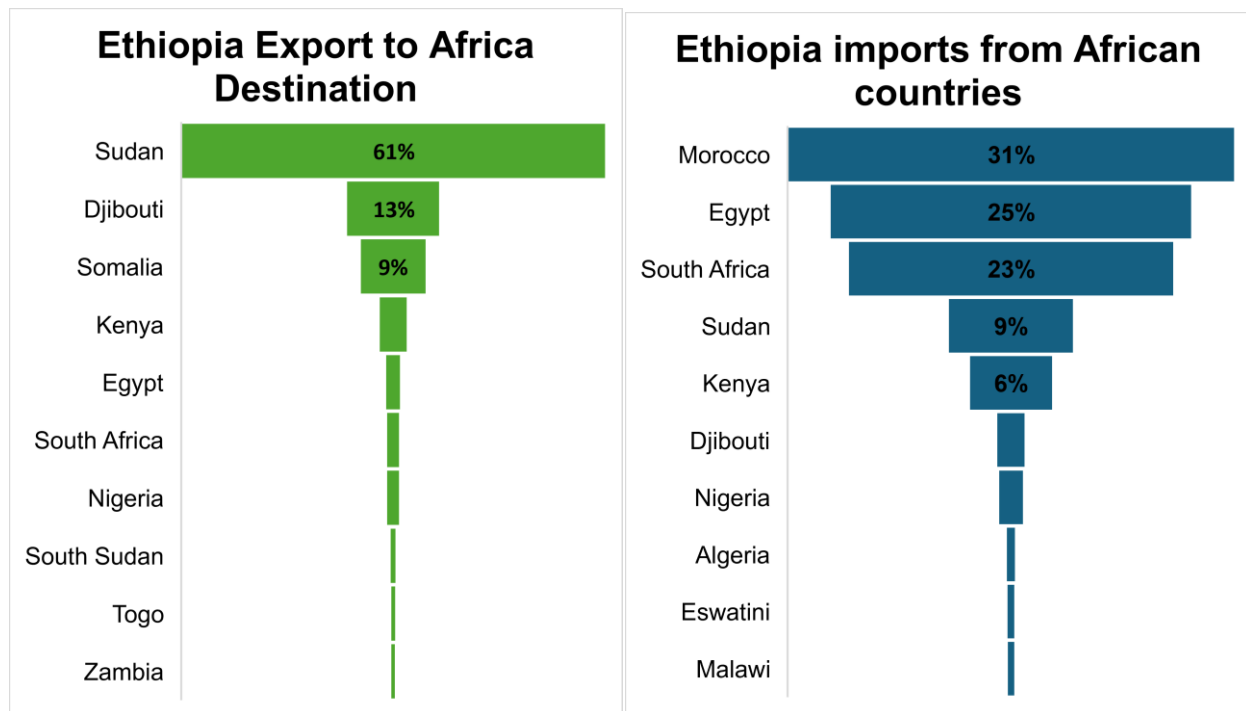


Source: Author's computations based on UNCTAD, 2023

Ethiopia exports to practically all African countries from 2016-2021, excluding the top three namely Sudan, Djibouti, and Somalia the remaining are quite tiny. Related to the manufacturers, Ethiopia achieved a surge in exports of electrical machinery and equipment

and parts components to the region (with the largest markets being Nigeria, Togo, Kenya, and Rwanda) during the reference period and a 4.1% import of vehicles from South Africa (almost 91%). According to this data, industrialization in Ethiopia is growing, and the AfCFTA will open new and expand the existing markets for the country's current products. Sectoral trade flows are minimal otherwise.

Figure 5. Ethiopia's Top Export and Import Destinations



Source: Author's computations based on UNCTAD (2023)

4. Theoretical Foundation of the Model

The Computable General Equilibrium (CGE) model serves as an analytical instrument for understanding the economic interplay resulting from policy shifts and their effects on aspects such as trade, climate, land, and labor migration, among others, across countries and products.

In the historical context of the 20th century, various mathematical economists introduced the CGE, building on the general equilibrium concept derived by Walrasian economists and the equilibrium proof provided by Arrow and Debreau. They utilized realistic data based on the algorithmic methods of Herbert Scarf (Velupillai, 2006). The CGE model was initially applied to developing countries in the 1970s. Its application was later expanded by Devarajan,

Lewis, Robinson (1986), and Decaluwe and Martens (1987), who employed structuralist CGE Models Taylor (1990).

The general equilibrium model explains structural equations that define the accounting link between the income earning and cost of expenditures of individual agents within the macro economy, as well as behavioral equations that explain the economic decisions made concerning the production, marketing, consumption, and trade interactions through the export and import of economic agents (firms, households, and the government) (Vargas, 2020).

The best approach for assessing the impact of AfCFTA implementation on the Ethiopian economy is Computable General Equilibrium (CGE). This is primarily because CGE enables the capture of interactions both within and between sectors and economies (Mark, 2007). To determine how the economy will react to changes in macroeconomic factors, such as policy changes or other exogenous shocks, the CGE is a conventional framework that relies on the use of actual trade data.

The theoretical foundation of the model is the firm and household optimization model. The firm minimizes costs subject to production output, and households maximize utility subject to budget constraints. Households and firms are price-takers. The model equations are price homogeneity based on the neoclassical dichotomy, that is, one price is fixed, and all other prices are evaluated to the numeraire, which means real variable and relative prices.

The model designs the regional household, which indicates the regional income that consists of private consumption, government consumption, and savings, to maximize the regional utility based on the theoretically constructed function.

The circular flow concept is utilized to frame the model, in which regional households are the owners of endowments and earn income from them, then spend the income on commodities or services and invest the remaining amount. On the other hand, the firms purchase endowment from the regional households and intermediates from other firms, then sell the final product to the regional households (Private households and the government as final demand) and intermediates. Moreover, in the rest of the world, firms interact with export and import activities, private households and governments purchase imports, and the rest of the world spends income on export and import taxes.

Regarding prices, the model incorporates the price differentiation among commodity and activity prices, which depend on the constant elasticity of transformation (CET). The activity and commodity prices are the sum of supplier prices and specific taxes or subsidies. Domestic prices differ across agents depending on the amount of tax incurred. On the world market supply side, Export prices are calculated based on FOB prices and export taxes. The import price is calculated as the CIF price that is the FOB price plus transport prices. On the demand side, each import-supplied product was sold at the price of commodities subject to sales taxes allotted to each agent. As an outcome, the composite agent price for commodities is determined by adding together the agent and investment prices of domestic and imported goods (Corong, Erwin et al., 2019).

The mathematical model equations based on the recent GTAP version 7 (Corong, Erwin, et al., 2019) are framed in eleven categories, namely the behavior of firms (10)⁵; supply of commodities (6); distribution of income (2); Income Allocation (7); final demand in the domestic market (21); product market equilibrium with trade (21); equilibrium at the factor market (8); global savings allocation (10); revenue from Tax (11); closure and numeraire (1); and welfare decomposition and measure (1). The model is designed to solve ninety-eight equations in total.

4.1 Production Side of the Equations

The firm is a cost minimizer subject to the production function with a constant return to scale. The amount of output derived from market equilibrium prices for output and inputs. Along the production tree, firms have constant elasticity of substitution. The total output minimizes costs by combining value-added and intermediate aggregate. Then, the value-added tree minimizes cost by combining labor, capital, land, and natural resource inputs, and the intermediate tree minimizes cost by combining the intermediate inputs.

$$\text{Minimize } C = \sum_i P_i I_i$$

$$\text{Subject to } Q = (\sum_i V_i Q_i^{-\rho})^{-1/\rho}$$

Where **C** is the total cost, **P** is the price of Inputs, **I** are inputs, **Q** is the Output, **V** is the technical change shifter, and ρ is the elasticity component.

⁵ The figures in the parenthesis are those from the equation for each individual category.

Meanwhile, the factor demand that is derived for value-added and intermediate inputs incorporates exogenous technical change, expansion, and substitution effects.

4.2 Consumer side of the Equations

The consumer side is represented by regional households, which consist of private and public households and savings. The regional household maximizes utility according to Cobb-Douglas preference. The private household utility function is non-homothetic and represents the Constant Difference Elasticity (CDE) function, which encompasses the Engel curve concept. Government (public) households have Constant Elasticity of Substitution (CES), and Saving is a Leontief function that is saving used for investment.

$$\text{Max}_{U_i} U = A \prod_i U_i^{\beta_i}$$

$$\text{Subject to: } E = \sum_i E_i (U_i)$$

Where U_i is the utility of the regional household, E is the expenditures, β is the preference parameters, and A is a scale parameter.

Based on utility maximization, the private household demand for commodities is derived, which is affected by the sum of commodities consumed and the price elasticity and income elasticities of demand that are calculated from the utility function and Allen partial matrix.

4.3 International Trade Equations

The international trade component affects the model of both the output and price on the side of the demand and supply.

Private household import demand, government household import demand, and investment demand are all aspects of the household side. Firms also demand imports. As a result, the import quantity demand for all agents is given as:

$$QMS_{c,r} = QPM_{c,r} + QGM_{c,r} + QIM_{c,r} + \sum_a QFM_{c,a,r}$$

Where QMS is the quantity of imports for commodities entering the regions, QPM is the import commodity demand by private households, QGM is the import commodity demand by public households, QIM is the import commodity demand for investment, and QFM is the import demand by all firms for activities and commodities.

From the production side through the intermediate input trees, the demand for domestic goods depends on the composite input (expansion effect), domestic input demand

(substitution effect), and domestic and import inputs (composite price). Then, the import demand from various sources is governed by the Armington elasticity of substitution, which is estimated econometrically.

Additionally, all the exports from various sources go-to firms, and regional households receive earnings through taxes.

Both the local market and the destination market share the same pricing for domestic supply. As viewed from the standpoint of international trade, the Free on-board (FOB) price is subject to export duties; the Cost of Insurance and Freight (CIF) price includes both the FOB price and the freight charges. In the end, the study simulation shock happens at the prices of imported supply, which include the CIF price and the import tariff. The three-price equation that is impacted by trade internationally is presented as:

$$PFOB_{c,s,d} = PDS_{c,s}TXS_{c,s,d}$$

$$PCIF_{c,s,d} = PFOB_{c,s,d} + TransportPrice_{c,s,d}$$

$$PMDS_{c,s,d} = PCIF_{c,s}TMS_{c,s,d}$$

Where: PFOB is the Free On-Board price; PDS is the price of domestic supply; TXS is the export taxes; PCIF is the price of insurance and freight; PMDS is the price of import supply; and TMS is the import duties.

4.4 Market Clearing

For a market to be in equilibrium for a commodity, domestic production must match sales on domestic or international markets and import supply must equal import demand. The endowment supply and demand are equal in the case of the factor market. The income constraints of regional households, international transport, and savings are also considered as other balancing factors.

Commodity Market equilibrium is expressed as:

$$QC_{c,r} = QDS_{c,r} + QST_{c,r} + \sum_d QXS_{c,r}$$

Where QC_{c,r} is the commodity supply, QDC_{c,r} is the sum of demand for all agents except export, QST_{c, r} is the global transport, and QXSc, r is the sum of export commodities.

Factor-market equilibrium is defined as:

$$QES_{e,a,r} = QFE_{e,a,r}$$

where QES_e, a, r is the aggregate endowment supply for activities and QFE_e, c, r is the demand for endowment by activities.

4.5 Closures of the Model and Numeraire

The model closure, which shows the exogenous and endogenous variable that expressed the Ethiopian economy, explains the outcome, which is indicated below taking into consideration the national policy framework:

Public Closure: Real spending and tax rates are set, whereas public savings are adjustable. As an outcome, the government's efforts to maintain its finances by changing both indirect and direct tax revenue constitute policy decisions. This means the public deficit has been adjusted to achieve the desired balance. The closure is in line with Ethiopia's economic reality, particularly its governmental finances. The deficit has been applying for the adjustment. Consequently, the study opts for the closure defined as expressing Ethiopia.

Endowment closure: the factor of production input moves across the sector domestically and does not flow across the region. It is a short-term frame in this model at the African level due to the language barrier across countries and the fact that labor cannot move freely, and capital is also limited. The study considers full employment.

In order to ensure each of the prices in the model is in proportion to the weighted unit price of the household's baseline expenditure packet, the consumer price index gets selected as the numeraire. Given that the model exhibits zero-degree price homogeneity, changing prices twice would not change the way resources are allotted. Therefore, the model is unable to take into consideration interactions between monetary and real economy sectors.

5. Result and Discussions

Based on the modalities adopted by the African countries, the simulation of the model seeks to investigate the effect on Ethiopia's economy when the African Continental Free Trade Area (AfCFTA) is implemented. Ethiopia is one of the Countries that will eliminate 90% of the tariff line in ten years, and the remaining 7% will do so after five years of transaction periods, which will be finished in eight years. Consequently, the decrease in customs duties began in 2021, which implies that in the case of Ethiopia, 97% of the tariff line for imports from African countries will be zero in 2033⁶. African countries concurred to apply various strategies to lower non-tariff barriers, including the online reporting and elimination mechanism for NTBs introduced by the AfCFTA secretariat.

In this view, the study has developed three scenarios for this analysis that expressed the Ethiopian economy.

1. Remove the import customs duties to 90% of the goods tariff line.
2. Remove the import customs duties for 90% of goods tariff lines and 7% of sensitive lists.
3. Remove the import customs duties for 90% of goods tariff line, 7% sensitive lists, and 20%⁷ reduction on non-tariff barriers on goods.

Using the observed values for all independent variables up to 2024 and incorporating the tariff enacted by the AfCFTA after 2025. Each potential outcome up to 2030 is included in the simulation, and the outcomes are shown by evaluating all relevant dependent variables.

The Ethiopian economy is also projected under a base case that excludes the AfCFTA. It gives other simulations a counterfactual. The impact of the policy shock distinguishes alternate shocks from policy changes' effects for each AfCFTA scenario considered.

5.1 Result of short run effect

The study's first section of analysis looks at the modality adopted by member states of the African Continental Free Trade Area's Agreement, which showed that tariff liberalization

⁶ The remaining 3% will be excluded from the liberalization.

⁷ Based on Maliszewska et al. (2020) state that actionable NTBs in Africa are at 50%, which is estimated as an additional 20% reduction of the cost for traded commodities using an ad valorem tariff equivalent.

began in January 2021 and at least eight nations⁸ began trading on selected products. As a result, the tariff reduction for non-sensitive products started; however, the sensitive will begin after 2026. Additionally, because of the five-year backlog and the fact that 2021 is the commencement date when Ethiopia begins liberalization in 2025, the countries are anticipated to liberalize 50% of the non-sensitive product tariffs rather than 10% every year. In light of the preceding, the non-sensitive will begin in 2026, and assuming the non-tariff barrier also starts in 2026, the first scenario was the pertinent one, so this section of the analysis concentrated on that.

5.1.1 Macroeconomic effects

5.1.1.1 Gross Domestic Product (GDP) Effect

The scenario built is shocking for Ethiopia's economy because the tariff reduction on non-sensitive products results in an increment in GDP of only 1%. The effect is quite small in the first year of implementation. This result aligns with the current reality of the Ethiopian economic situation: agriculture is not commercial farming and is dominated by low-productivity small-scale farmers. In this case, heavy industry investment by domestic and foreign investors is low, but there has been progress over time.

5.1.1.2 Effect on Government Revenue

One expected result of a tariff reduction is a decrease in government revenue. In this scenario, the loss is not significant at US\$24.3 million. The main reason for this is that intra-African trade is low, so the effect is negligible.

In addition, the products that will be liberalized under the non-sensitive category have quite high average tariffs—15.42% for crops, 3.09% for livestock and meat, 7% for extraction, and 13.33% for heavy manufacturing—which prevent them from being imported into Ethiopia. However, if the tariff reduction includes the sensitive sector, it might lead to higher imports of all products, and the effect may be worse than this figure.

⁸ Cameroon, Egypt, Ghana, Kenya, Mauritius, Rwanda, Tanzania, and Tunisia.

5.1.2 Sectoral effects

5.1.2.1 Sectoral Outputs Effects

The output is classified into three categories for analysis purposes: The first is the total industry output in the overall economy, which is an increase in all sectors. This refers to liberalization having a positive effect on increasing production, which aligns with the theory of international trade. The liberalization created more market access opportunities, which led the firms to produce more. Therefore, agriculture and industry output are increasing in both liberalized and non-liberalized sectors, which is the spillover effect. The output shift has an impact on Africa in Ethiopia's liberalized sector but no impact on non-liberalized and heavy manufacturing. As an illustration of the small country's effect once more, the outcome is almost zero.

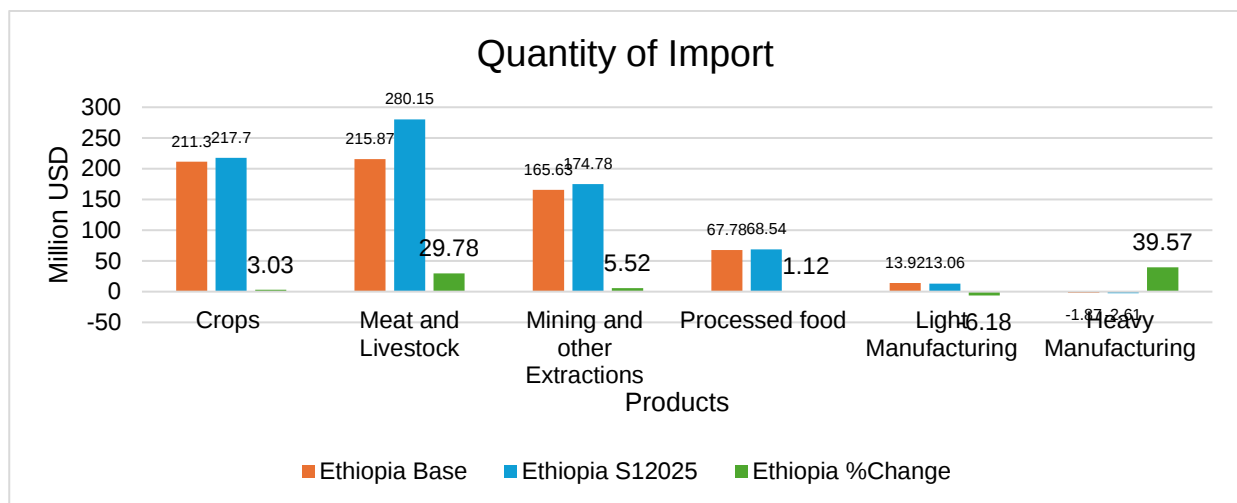
Table 1. Total output effect

Qo	Ethiopia			Rest of Africa		
	Base	S12025	%Change	Base	S12025	%Change
Crops	25.22	25.81	2.34	0.09	0.09	0
Meat and Livestock	44.28	45.7	3.21	0.08	0.09	12.5
Mining and other Extractions	18	18.28	1.56	-0.01	-0.02	100
Processed food	67.41	69.48	3.07	-0.04	-0.04	0
Light Manufacturing	67.97	70.64	3.93	-0.06	-0.06	0
Heavy Manufacturing	61.74	64.03	3.71	-0.06	-0.06	0

Source: Own calculation from the GTAP Output.

The second part of the output effect on import commodities from the agricultural sector and heavy manufacturing are an increase in those included in the non-sensitive sector, and processed food is also increasing the quantity of imports. The sector might need a small value addition from the agricultural sector. However, the light manufacturing sector is not increasing; this will happen due to the low level of industrialization in Africa and the shifting of the factor from sophisticated industries to easier-to-produce sectors such as agriculture and food.

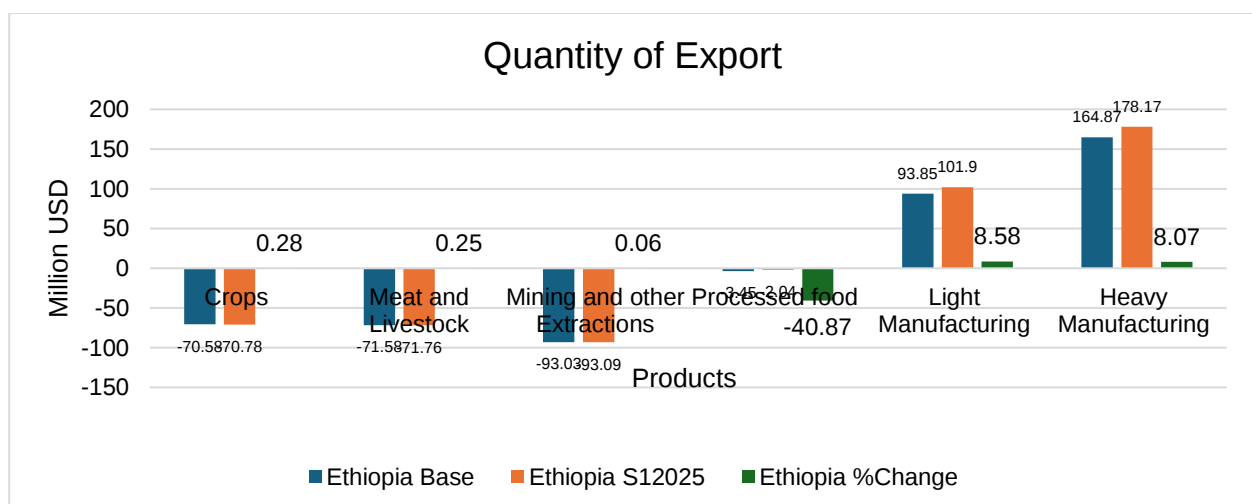
Figure 6. The effect on the quantity of import



Source: Author's diagram from GTAP Output

The third part of the output effect on the export commodity side, for the agricultural and mining sectors, does increase a small amount due to the high competition from other African countries and the surge of huge import quantities. However, in the industry, light and heavy manufacturing sectors export amounts will increase, except for processed food. According to this scenario effect, AfCFTA creates more market opportunities for the industrial sector than the agriculture and mining sectors.

Figure 7. The effect on the quantity of export



Source: Author's diagram from GTAP Output

The overall finding suggests that the total output augmentation for the liberalized sector, which mostly consists of agriculture, livestock, and mining, happens on both the domestic production and import sides but not on the export side. The increase in manufacturing output

is also due to an increase in domestic production across the board, imports of processed foods and heavy manufacturing, as well as exports of light and heavy manufacturing.

5.1.2.2 Export and Import Price Effects

For the commodities that have undergone liberalization, export prices are rising for agricultural products while import prices for all products are falling. This finding demonstrates that Ethiopian producers receive a better price on the African market, which encourages businesses to increase their exports. On the other side, import prices decrease, and Ethiopia's demand for imports from African partners goes up. consumers may purchase goods for less money, and consumers will experience a certain consumer surplus.

As indicated in the figure below, the price of export crops, meat, livestock, and mining is increasing while the price of imports is declining for these three products, especially livestock. The main reason for the increase in export prices is the variety of products in the agriculture and mining sectors. For instance, Ethiopian coffee differs from Rwandan coffee, and similar comparisons work for the mining sector. In addition, the model works on the aggregation of crops, meat, and livestock, and mining needs further analysis at the Harmonized Custom Code level required. Furthermore, the price effects are driven by liberalization and sectoral re-allocation based on efficiency in the various sectors.

Figure 8. The effect on prices



Source: Author's diagram from GTAP Output

Regarding industrial products, heavy manufacturing, for which the shock was implemented, has seen both import and export prices decline. In addition, the product, which is considered sensitive, also decreases both imports and exports due to the linkage of the sector with other sectors. The impact of the AfCFTA might lead the industry to get input from other African countries and strengthen the regional value chain across countries.

5.1.3 Household and Firm Effect

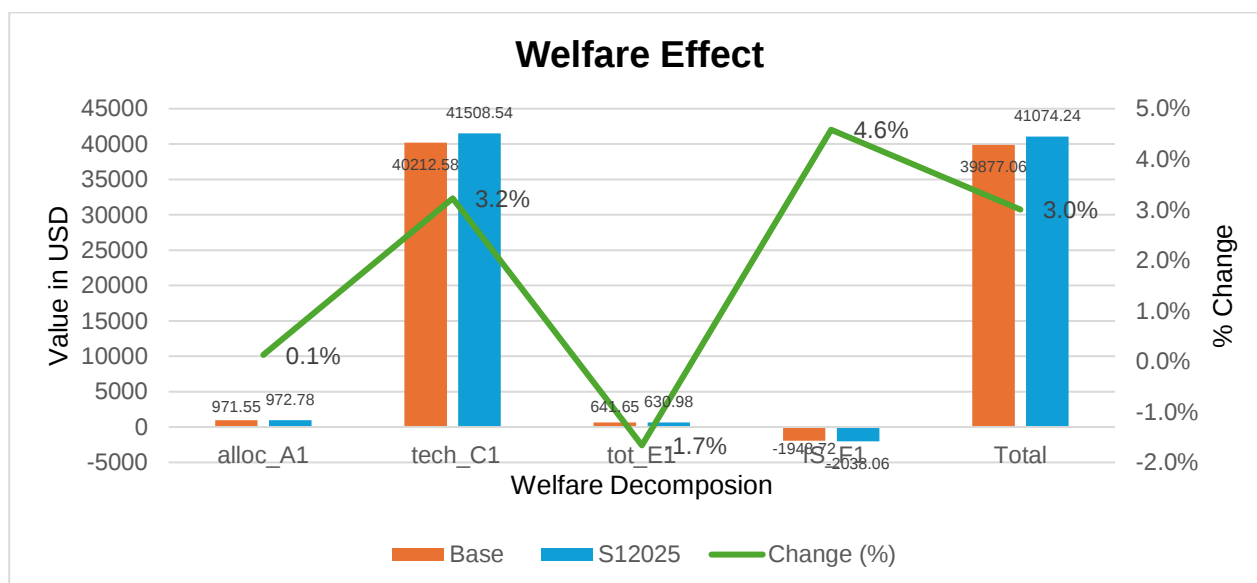
5.1.3.1 Welfare effect

The welfare effect is the change in the utility of regional households that is expressed by the per capita variable that is derived from the Cobb-Douglas function on aggregate private households, government, and savings. The Equivalent Variation (EV) is used as a measurement of welfare that indicates the change in income required to ensure the same effect on utility as tariff or non-tariff barrier changes. Therefore, EV is a money metric term, the difference between utility and preference before and after changes at the given price.

The sum of allocative efficiency, terms of trade, technological advancements, endowment shifts, demographic shifts, and investment and saving patterns is the component of the welfare impact. Decomposing the equivalent variation yields a description of the effect based on the constant difference elasticity demand function (Hertel et al., 2006).

The result of the tariff reduction is an improvement in welfare at the household level. Therefore, the trade linearization of Ethiopia's allocation efficiency, other technical changes, and investment and savings brought about by the African Continental Free Trade Area are crucial to this welfare enhancement.

Figure 9. The Effect of Welfare



Source: Author's diagram from GTAP Output

Due to the increase in market output, allocative efficiency, technical changes, and investment and savings, a welfare gains around 3% was generated. With further breakdown, the substitution impact takes precedence over the expansion effect. The substitution effect occurred because of the drop in import prices. Overall, the technical change effect is higher than allocative efficiency and investment savings. On the other hand, the terms of trade have not improved within the given period.

Furthermore, because Ethiopia's economy has relatively limited trade with other African countries, there is no significant effect on the welfare of other countries. Since Ethiopia will liberalize the non-sensitive products that are subject to the tariff reduction, mainly agriculture, mining, and heavy industries, an increment in the production of this sector is not possible, at least in the short run. It might take time to enhance production, and preparation is required for the firms and farmers to increase production.

5.2 The result of the comparative-static model

The section examines the effects of reduced tariffs at the end of 2030. The analysis takes into consideration, as scenario one, the tariff liberalization of the remaining 50% reduction for non-sensitive products by imposing the 10% reduction per year up to 2030. In scenario two, the sensitive product's tariff reduction combined with the non-sensitive product's tariff reduction in scenario one, depending on the AfCFTA's adopted modalities. The elimination

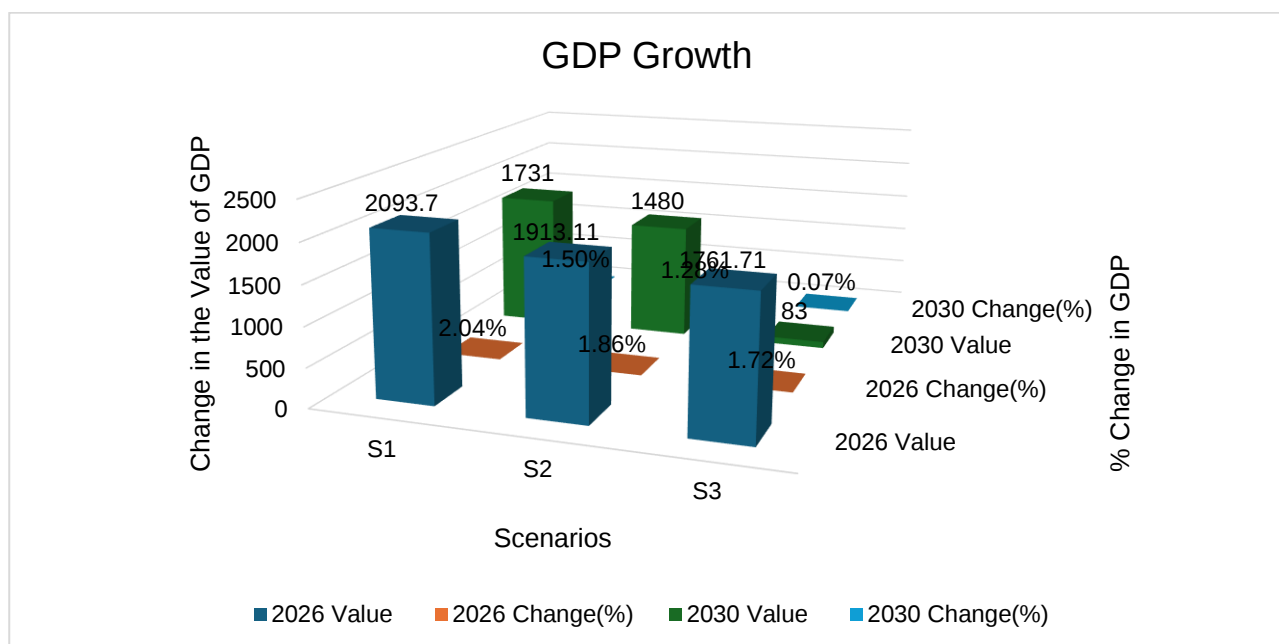
of non-tariff obstacles by 20% in 2030, together with the tariff removal of scenario two (sensitive and non-sensitive), constitute scenario three. The current economic trend, which includes annual economic growth, serves as the base year for each scenario. Moreover, the items are subject to progressive liberalization based on the liberalization approach to which African countries have committed. Therefore, the part below provides a summary of the impact of each scenario on economic variables.

5.2.1 Macro-economic effects

5.2.1.1 The effect on Gross domestic Product (GDP)

The findings of all three scenarios show that Ethiopia's tariff liberalization had a favorable impact on raising GDP over various periods. In the first scenario, the end of 2030 marks the removal for non-sensitive, which results in the biggest GDP growth. Figure 8 shows a 2.14 billion USD rise in GDP in 2030.

Figure 10. The GDP growth in each year



Source: Author's diagram from GTAP Output

In comparison to the other scenario, scenario one had the biggest GDP increase in 2030, according to the outcome. This suggests that, in the short term, a drop in tariffs for all goods may not have the desired effect on economic growth. Specifically, the increase in consumption, which has increased by about 76%, accounts for the greatest portion of the disaggregated effect. The remaining increases in exports, imports, and investment on GDP growth are caused by a decline in imports. This finding can point to the minimal magnitude

of the change in GDP and the necessity for the expansion of existing firms and the entry of new investments to improve the performance of the economy. The findings of the UNECA report from 2023 were consistent.

5.2.1.2 Government Revenue Effect

According to the most recent tariff book, Ethiopia's average tariff is 15%, with agricultural products subject to a higher duty than industrial goods. The average revenue from import duties attributed to Africa was around 25% of the total and little in comparison to the rest of the globe, according to the most recent five-year data (2014–2019).

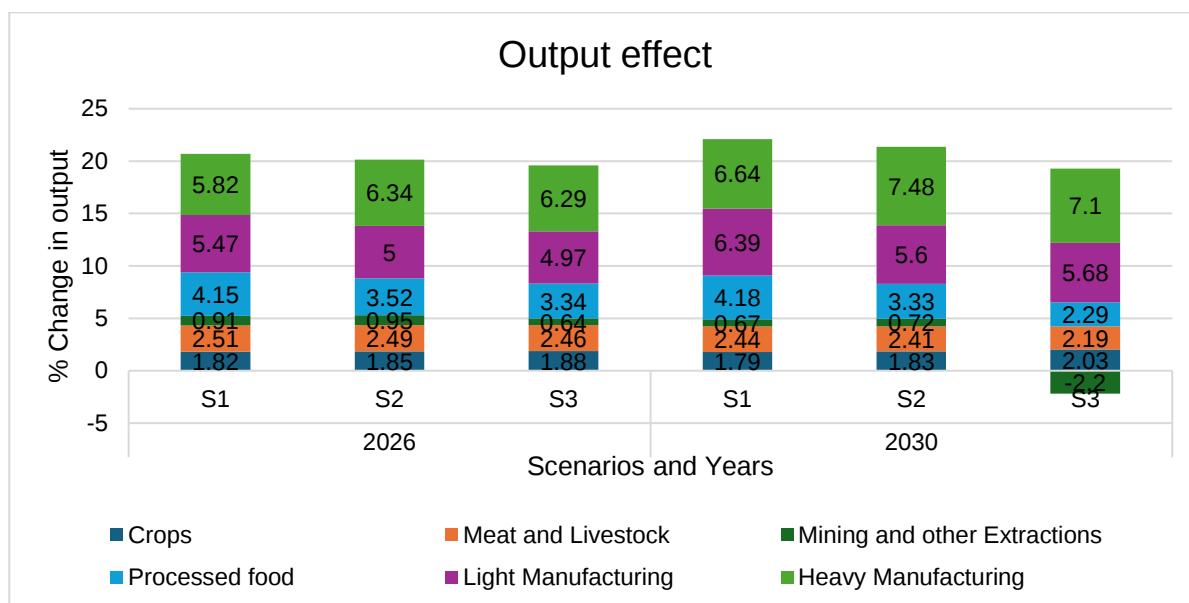
In the case of AfCFTA's tariff elimination, the government's loss is 269 million USD under full product coverage. Even though the size is different, the revenue loss finding matches up with the UNECA Report (2021). However, the result does not express itself in the future to some extent; firstly, if the quantity of imports increases by a larger amount, the effect of the revenue loss will be more severe. Secondly, even though the quantity of imports is increasing, the government collects the money from domestic taxes, including value-added taxes, excise taxes, and surtaxes. Third, in the AfCFTA package, there is a scheme called the AfCFTA adjustment mechanism that allows for the possibility of utilizing those approaches.

5.2.2 Sectoral effect

5.2.2.1 The effect of sectoral Outputs

The entire output of agricultural and industrial goods has increased because of Ethiopia's market opening to other African nations over the years. In terms of growth, the industrial sector has outpaced both the agricultural and extraction sectors in all scenarios. This suggests that the AfCFTA will expand access to markets for industrial goods that process food and engage in light and heavy manufacturing.

Figure 11. The impact of tariff removal on the total output

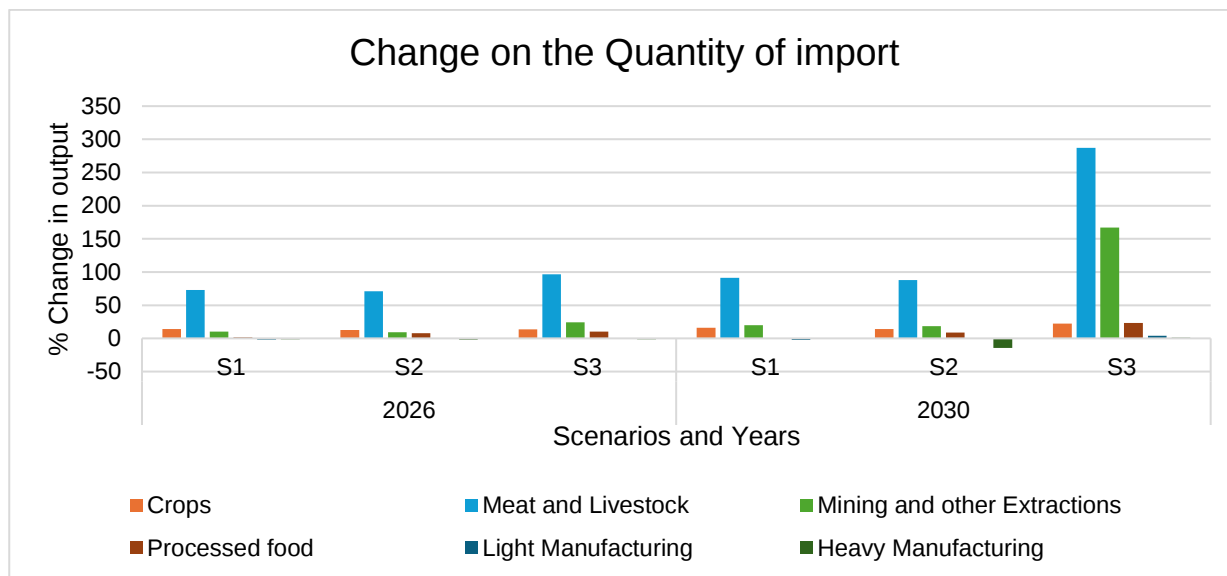


Source: Author's calculation from GTAP Output

Associated with the product-level impact of livestock and meat, agriculture, and the mining industry are lower output increments compared with heavy manufacturing, light manufacturing, and processed food. It demonstrates that Africa's agriculture has low productivity and does not take advantage of modern technology. It can become more challenging because of the massive increase in production. The non-tariff barrier reduction effects are more significant for the crops, meat, and livestock sectors.

Regarding the quantity of imports, except for light and heavy manufacturing, the volume of imports is rising over time and across each sector. This illustrates that the elimination of tariffs opens the Ethiopian market to product exports from African nations. Apart from a slight decrease in import volume for mining items in scenario three, the consumer receives the commodity at a lower price for agricultural products in each scenario.

Figure 12. The impact of tariff removal and NTBs on the import quantity

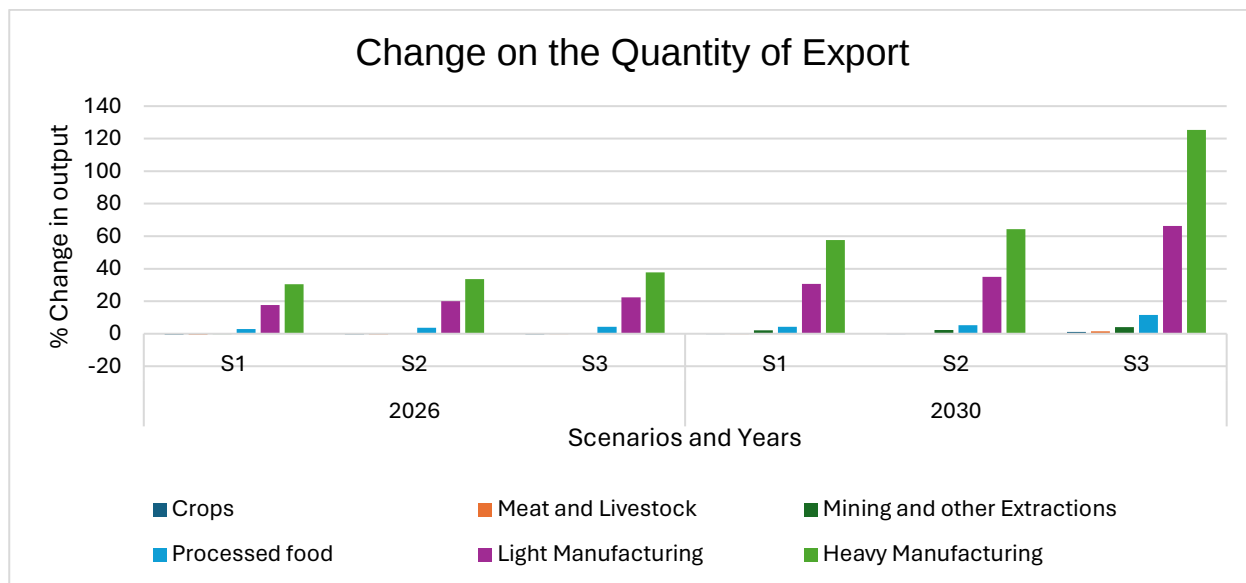


Source: Author's calculation from GTAP Output

The import quantity effect in the livestock and meat sectors is greater to see the impact on the product level, which is consistent with the import price fall outcome. In the field of meat and livestock, Africa has enormous potential. Due to the increase in imports into the Ethiopian market, the consumer will get these goods at a lower cost. Although the impact is small, it is like crops and processed food.

In relation to the quantity of export, the quantity of export for agricultural products does not increase. On the other hand, industry sector exports are increase in all scenarios. Therefore, the result is mixed.

Figure 13. The impact of tariff and NTBs removal on the export quantity



Source: Author's calculation from GTAP Output

At the product level, the crop, meat, and livestock sectors are not able to increase; even though the price of exports is increasing, Ethiopia is not able to increase the production of crops and livestock. This might be due to the low level of productivity in these sectors. The extraction sector expands over time with a 2% increment in quantities. On the manufacturing side, the quantity of exports is increasing, with light and heavy manufacturing in greater amounts and processed food in smaller amounts. This implies that the AfCFTA creates market access for manufacturing products because the manufacturer gets cheaper input from Africa due to the decline in import prices. However, the overall export price for this sector is declining. Therefore, the AfCFTA effect on export matters favors the manufacturing sector more than the agriculture sector. In conclusion, the greatest benefits are observed in the third scenario, where both tariff and non-tariff barriers are eliminated.

The intra-African trade reached about 25% in the study of Fofack et al. (2021), which is done across all of Africa as a whole; in this study, Ethiopia's increase fell short of that mark except in the light and heavy manufacturing sectors.

5.2.2.2. Effects on Import and Export Prices

A decrease in the price of imports and exports is anticipated to happen when tariffs are and non-tariff barriers removed from African nations. First, the price of imports will decrease in all scenarios, along with all the specified times and goods. Additionally, in scenario three,

the reduction in tariffs and the impact of non-tariff barriers is higher, which is applicable to the restrictions coming from Africa not only the tariff side but also the effect of quotas and other trade restriction measures has significant impact as the output increases.

Figure 14. The impact of tariff and NTBs removal on the import price



Source: Author's calculation from GTAP Output

Regarding the impact on individual products, the cost of cattle and meat is reduced by around 17%, followed by mining and processed food at 13% and 7%, respectively, and heavy and light manufacturing at almost 4%. This suggests that the AfCFTA will enable consumers to purchase the product at a lower cost because Africa has a large livestock and meat sector. The same justification holds true for processed foods, crops, and light manufacturing.

Second, outcomes are mixed for exports, with an increase in agriculture and mining at the early stage and a decrease through time in 2030. On the other hand, the price of industrial products decreases under all scenarios. Figure 15 indicates that the drop in industrial items over time is becoming increasingly consistent, whereas the price growth for agricultural products is changing throughout time.

Figure 15. The impact of tariff removal and NTBs on the export price



Source: Author's calculation from GTAP Output

At the product level, scenarios one and two show an increase in crops, live animals, and meat in 2026. However, the cost of exporting industrial goods used in light and heavy manufacturing as well as food processing is declining. This implies that Ethiopian exports receive a better price for agricultural items in the African market for a short period of time, while the price of exporting industrial goods is falling as a result of fierce competition from other African nations. On the other side, the effect on the rest of Africa is that the price of crops does not change, and the AfCFTA does not resolve the issue within the first year of implementation, while the AfCFTA might help African countries become self-sufficient in the production of agricultural goods after five years. Additionally, the manufacturing process has an impact on prices for exports, which encourages firms to export industrial goods to the African market.

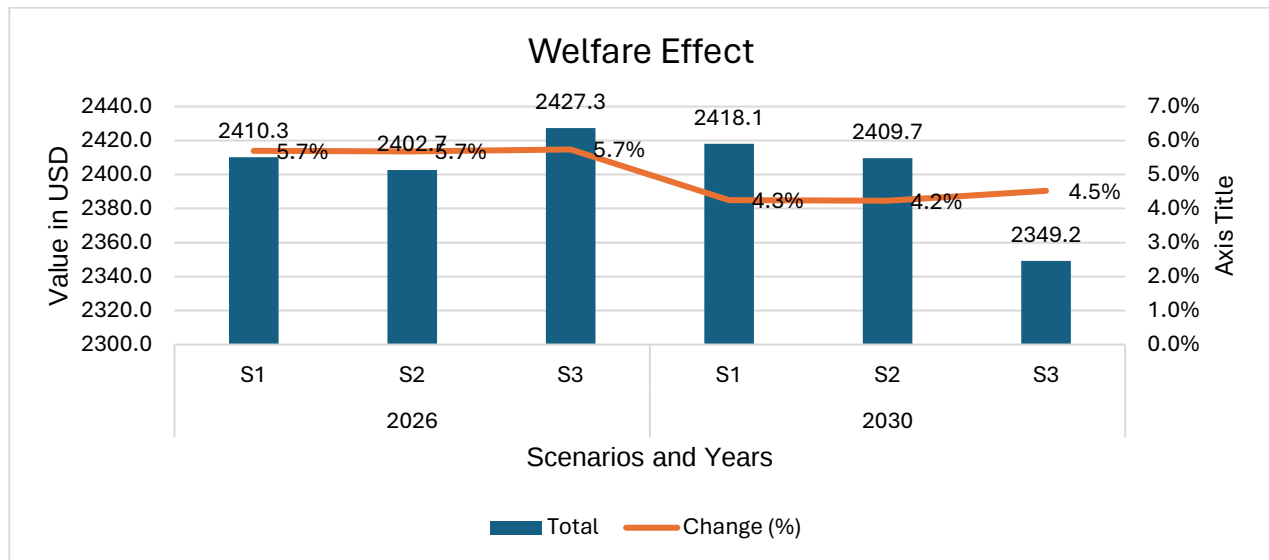
5.2.3 Household effect

5.2.3.1 The Effect on Welfare

The model employed for this analysis breaks down the welfare effect into seven constituents and considers the full employment assumption that factor production is flexible within a sector but not across geographic regions. Allocative efficiency, technical efficiency, terms of trade, investment, and saving all have an impact on welfare. Based on the overall outcome,

scenario three would result in welfare gains that are bigger than other scenarios, reaching 4.5% growth in the years by 2030. This finding demonstrated that, in the context of welfare, the removal of tariffs and non-tariff barriers in agricultural and industrial sectors has a higher welfare gain relative to the only tariff reduction.

Figure 16. The effect on Welfare in 2026 and 2030



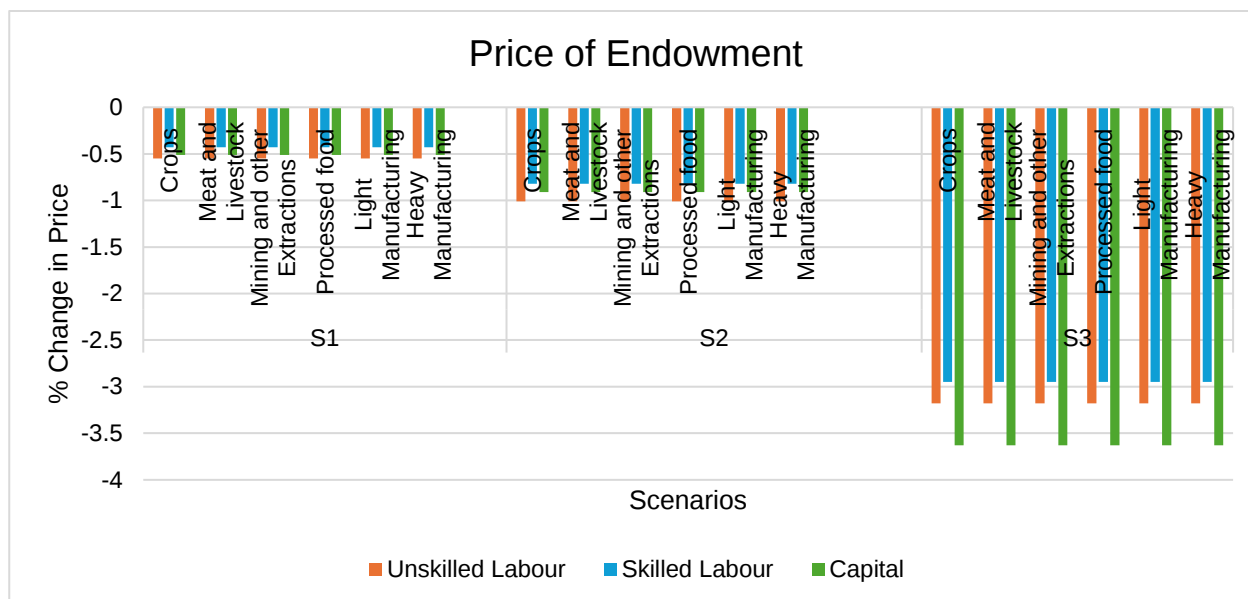
Source: Author's diagram from GTAP Output

The welfare in the model result explains the change in income required to ensure the same effect on utility as the tariff and non-tariff barriers are removed. Due to the increased output supply from domestic and import sources, technical changes share is higher in terms of the overall effect in terms of categories. The next largest share is the improvement in allocative efficiency brought on by input, consumption, and import taxes. The agricultural sector has the slightest impact on terms of trade. Domestic consumption is rising, which causes domestic savings to decline. This study's findings are in line with the IMF Report by Librego et al. (2019), which concludes that lower non-tariff barriers and the elimination of tariffs increase welfare in African countries.

5.2.3.2 The effect of factor markets

The factors of production include labor (skilled and unskilled) and capital. In all scenarios, the price of all endowments will decrease if we consider that labor is mobile across sectors but not across regions. Given that capital is fixed, investments cannot increase the capital stock used for production.

Figure 17. The effect on labor and capital



Source: Author's calculation from GTAP Output

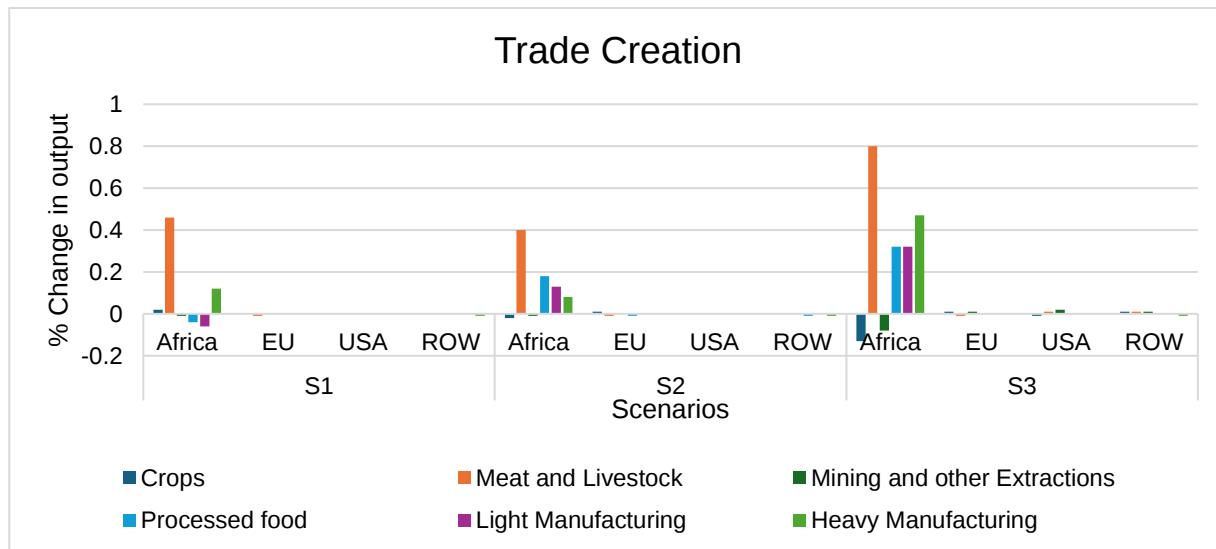
The findings displayed in Figure 17 suggest that the cost of labor and capital is declining, with the manufacturing sector being more positively affected than the agriculture sector by getting cheaper labor in the market in 2030. This suggests that as the manufacturing sector grows because of the AfCFTA's market growth, there will be a strong demand for labor in general and unskilled labor in particular. Processed food and light manufacturing may require more work than usual.

5.2.4 Trade Creation and Diversion

The AfCFTA agreement could change the trade patterns among partner countries, especially towards African countries, due to the tariff elimination covered in this part. By Mattoo et al. (2019), the countries agreed among themselves, and the reduction in tariffs resulted in an increase in trade between the member countries, which is a trade creation effect. However, members can substitute the import from the previous partner for the import from the countries that become members of the agreement, which is a trade diversion component.

For the analysis, purpose, the study considers the effect on the year 2030, when Ethiopia removes all the non-sensitive products and the most sensitive products tariff, to assess the impact of trade creation and trade diversion in all scenarios.

Figure 18. The trade creation effect

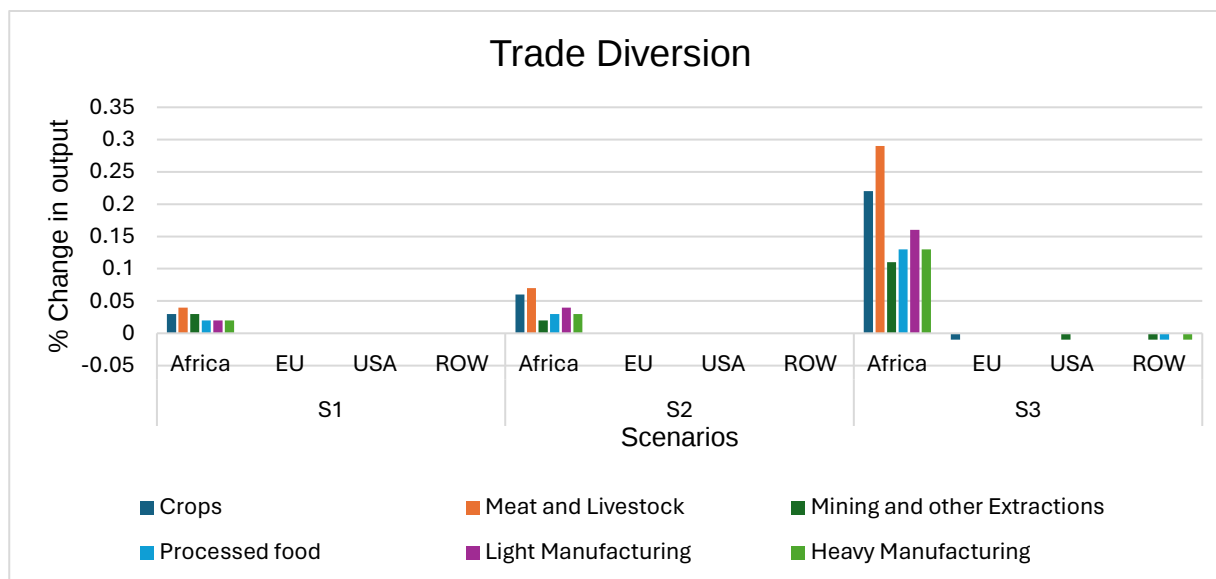


Source: Author's calculation from GTAP Output

Regarding the outcome displayed in the prior graph, when Ethiopia implements only the non-sensitive sector, market access for meat and animal products, heavy manufacturing, and crops increases, but the extraction sector does not increase because many African countries have different minerals and do not anticipate trade in those sectors. Because there is no trade in the processed food and light manufacturing sectors, these are protected sectors in scenario one. In scenario two, all economic sectors in Africa—aside from crops and mining—experience trade growth. As the processed food, light, and heavy industries expand, the rationale can be that the raw crops will undergo value addition; in this case, scenario one's justification holds true for the extraction. In case three, there is better market access for meat and livestock, processed foods, and light and heavy manufacturing.

There is a minimal impact of the trade diversion on all scenarios and in all sectors. Particularly, there is negligible trade divergence for both agricultural and manufacturing items in scenario three.

Figure 19. The trade diversion effect



Source: Author's calculation from GTAP Output

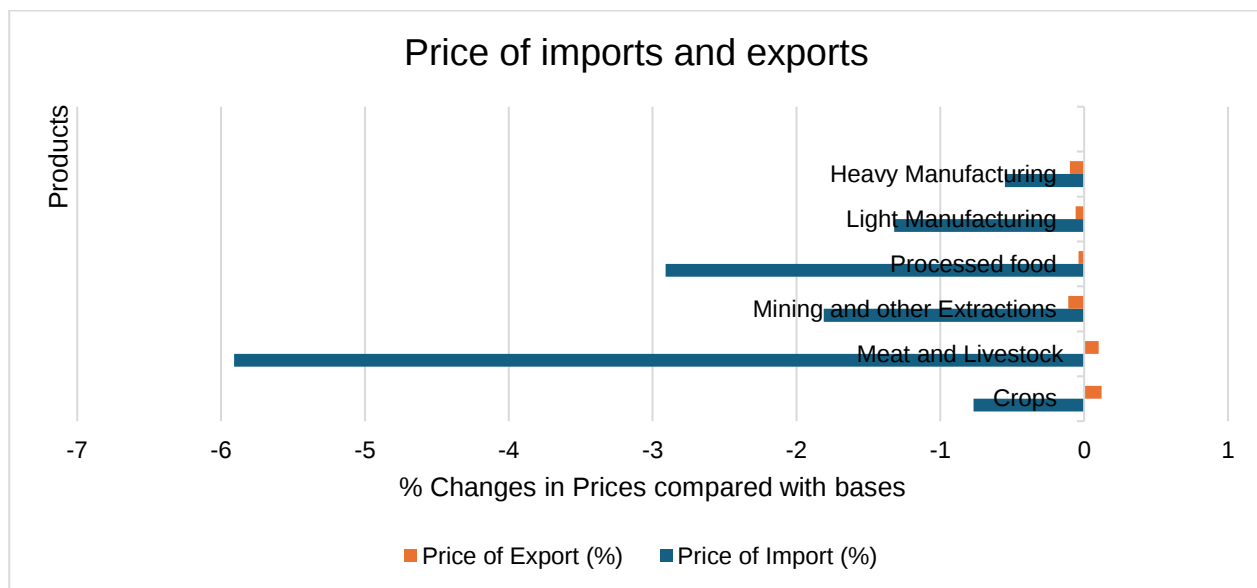
The study by Radouane et al. (2021) on the effects of the AfCFTA on Morocco's economy found that trade with Africa had a sizable trade diversion effect. In contrast, there are no substantial trade diversion impacts in Ethiopia's situation.

5.2.5 Overall effect of full liberalization in the Perfect Competition Market

The liberalization of AfCFTA member countries is projected to be fully realized by 2033. At this juncture, all sectors, both sensitive and non-sensitive, in Ethiopia and across Africa will be completely liberalized. The cumulative impact of this scenario is an increase in welfare by USD 68.4 million. Allocative efficiency takes the largest share due to the increased output. To provide further detail, the substitution effect is greater than the expansion effect due to the reduction in prices. The other variable for the welfare gain is the terms of trade improvement.

Related to the price of import and export, all products import prices are declining, and all export prices except crop, meat, and livestock are also declining. The results are indicated below.

Figure 20. Price of imports and exports due to full liberalization

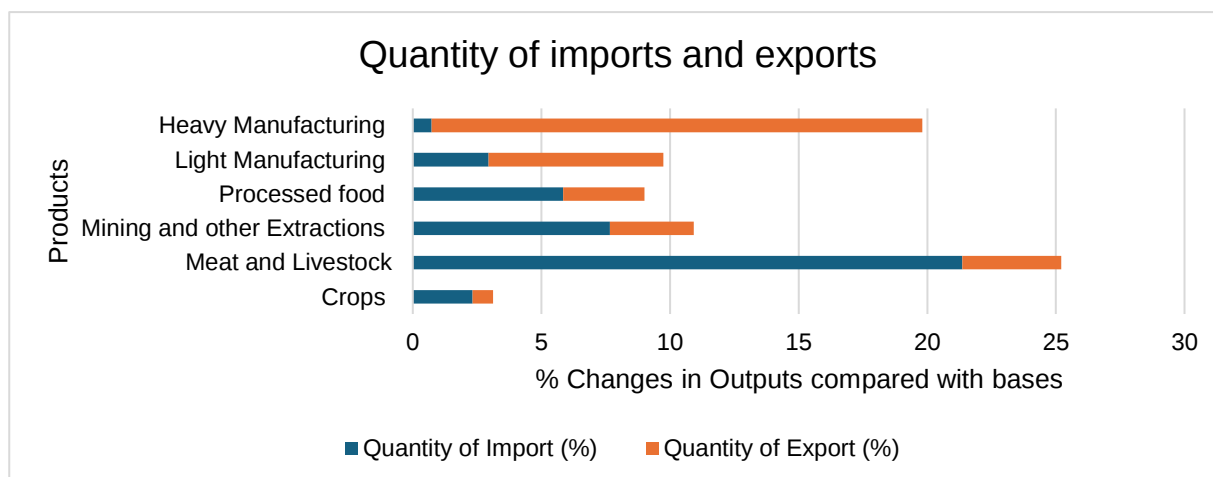


Source: Own calculation from the GTAP output

The outcome of Figure 18 implies that both exports and imports are becoming less expensive because of the increase in imports into Ethiopia and the fierce competition. Africa is still a net importer of food, including crops, meat, and livestock; the change may be a shift in partner rather than a decline in price. Moreover, the price of value-added inputs such as unskilled and skilled labor, land, and capital will increase.

In terms of output, Ethiopia's and other African countries' complete liberalization increases both total output and the volume of imports and exports. These imply that the elimination of tariffs will increase production by allowing for cheaper input from other African nations through the regional value chain. As an effect of the AfCFTA's creation of new market access through the removal of tariffs, the volume of imports into Ethiopia is also rising. On the other hand, by gaining access to markets with other African nations, the volume of exports will rise, and firms will be inspired to produce more to meet the increased market demand brought on by the AfCFTA.

Figure 21. Quantity of imports and exports due to full liberalization



Source: Own calculation from the GTAP output

In keeping with the expected pricing outcome, the price of imports decreases as the volume of imports rises. Additionally, more agricultural products are being exported because firms are attracted by higher pricing in African nations. But even if export prices for mining and manufacturing items are falling as a result of tough competition, export volume is rising.

Lastly, trade creation and diversion with the implementation of free trade areas for all products, trade creation will occur for manufacturing products that are processed food, light manufacturing, and heavy manufacturing. While trade diversion will only be slight for all products.

Table 2. Trade creation and diversion under full liberalization

Products	Trade Creation		Trade Diversion	
	Ethiopia	Rest of Africa	Ethiopia	Rest of Africa
Crops	0.79	-0.05	2.33	0.1
Meat and Livestock	3.85	-0.01	21.36	0.15
Mining and other Extractions	3.26	-0.02	7.66	0.02
Processed food	3.17	0.11	5.84	0.03
Light Manufacturing	6.8	0.22	2.94	0.04
Heavy Manufacturing	19.08	0.11	0.73	0.04

Source: Own calculation from the GTAP output

5.3 The effect of full liberalization within an imperfect competition market

Some scholars posit that the impact of trade liberalization in Africa is distinct from its effect in other developed countries that operate within a perfect competitive market. They describe the African markets as one of imperfect competition for specific products due to various constraints such as protection of infant industries, food security, societal livelihood, unemployment, and more. Despite a detailed analysis at the individual product level and categorization of products into monopoly, oligopoly, and monopolistic competition, the study employed the monopolistic competition market model with elasticity parameters defined by Caliendo and Parro (2015) to scrutinize the imperfect competition market.

5.3.1 Macro effect

5.3.1.1 Gross Domestic Product (GDP)

In the context of an imperfect competition market, full liberalization leads to a GDP increase of 0.5% for Ethiopia, compared to 2% under perfect competition and 0.02% for the rest of African countries. This outcome suggests that the AfCFTA does not boost the GDP of economies growing at the current rate. Therefore, a structural economic transformation is necessary to derive greater benefits from the free trade area.

5.3.1.2 Government Revenue

The potential for revenue loss is a concern for countries joining the FTA. Under perfect competition, Ethiopia's government revenue loss was 533 million USD, which is higher than the 269 million USD loss under perfect competition. Hence, the countries should utilize the adjustment mechanism at the African level and implement their own at the country level.

5.3.2. Sectoral levels effect

5.3.2.1 Output effect

By the end of 2033, all tariff lines across all countries will be fully liberalized. This results in an increase in the quantity of imports to Ethiopia and other African trading partners. However, the increase in Ethiopia is more significant than in other African countries due to its relatively high tariffs. When comparing the outcomes of imperfect competition with perfect competition, the increase is less under imperfect competition. Ethiopia also sees an increase in the quantity of exports, but this is not the case for Africa's trading partner for agricultural and mining products.

Table 3. The percentage change in the quantity of imports and exports

Products	Quantity of Imports		Quantity of Exports	
	Ethiopia	Rest of Africa	Ethiopia	Rest of Africa
Crops	1.82	0.06	1.75	-0.11
Meat and Livestock	20.48	0.08	1.61	-0.02
Mining and other Extractions	6.16	0.04	7.53	-0.03
Processed food	4.27	0.03	0.94	0.05
Light Manufacturing	1.71	0.04	2.12	0.13
Heavy Manufacturing	0.3	0.04	4.31	0.16

Source: Own calculation from the GTAP output

The above table indicated a higher increment in imported output in meat and livestock (20.5%), mining (6.2%), and processed food (4.3%). While the quantity of exports increased in mining (7.5%), heavy manufacturing (4.3%), and light manufacturing (2.1%), For the rest of African countries, the effect is less than 1% both in export and import output.

5.3.2.2 Price effects

Under imperfect competition, the price effects for the rest of the African countries are minimal. However, Ethiopia experiences a reduction in both export and import prices. This outcome aligns with the output effects; the economies that previously had high levels of protection, like the Ethiopian market, are more affected by the liberalization under AfCFTA.

Table 4. The percentage change in the price of imports and exports

Products	Price of Imports		Price of Exports	
	Ethiopia	Rest of Africa	Ethiopia	Rest of Africa
Crops	-0.97	0	-0.24	0.02
Meat and Livestock	-6.08	-0.01	-0.28	0.02
Mining and other Extractions	-1.89	0	-0.48	0
Processed food	-2.55	0	-0.38	0.02
Light Manufacturing	-1.15	0	-0.39	0.02
Heavy Manufacturing	-0.62	0	-0.41	0.02

Source: Own calculation from the GTAP output

The decline in the price of imports is more for meat and livestock (6.1%), processed food (2.6%), and mining (1.9%). In the rest of Africa, the only change occurs in meat and livestock. On the export side, there is a reduction in mining (0.5%), light manufacturing (0.39%), and processed food (0.38%). The effect on the rest of Africa is 0.02% for all products except mining, which does not change.

The overall effect shows that, in terms of price and output, tariff liberalization has less effect on the rest of Africa compared to Ethiopia. Additionally, the total effect of imperfect competition is smaller than that of perfect competition.

5.3.3 Households effect

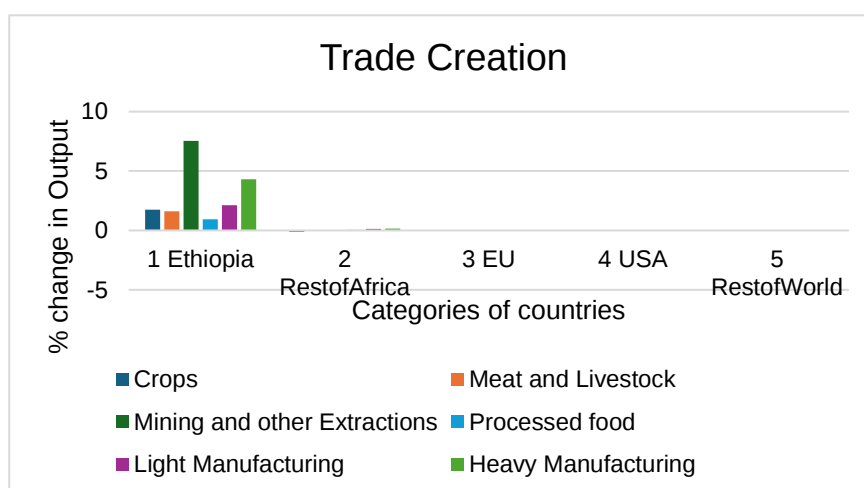
5.3.3.1 Welfare

The welfare impact is reflected in allocative efficiency, technical changes, and investment savings. The overall effect suggests that Ethiopia does experience a welfare increase of 38.70 million USD. On the other hand, the rest of African countries also saw welfare improvements amounting to 99.83 million under imperfect competition. However, under perfect competition, Ethiopia experiences higher welfare improvements. Hence, the market structure needs to approach perfect competition for Ethiopia to reap the expected benefits from the AfCFTA. Otherwise, the Free Trade Area will not allow Ethiopia to achieve the desired benefits.

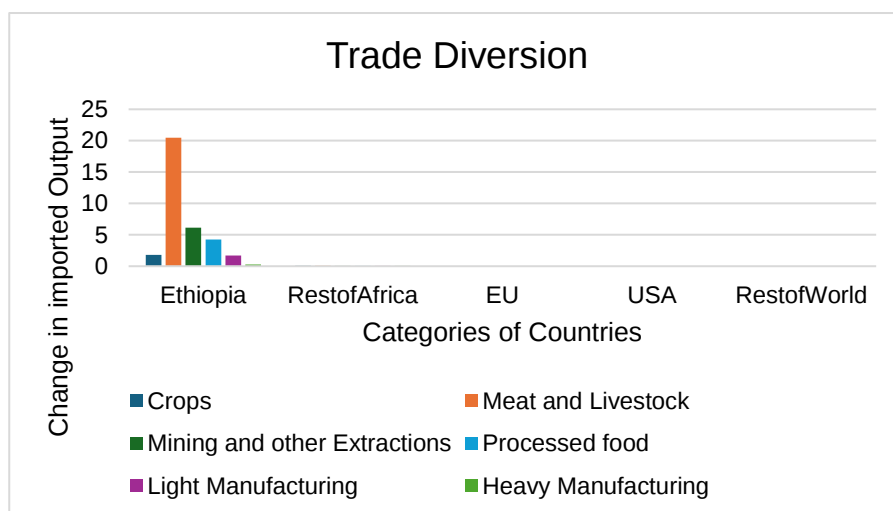
5.3.4 Trade Creation and Diversion

The study classified the countries into five categories: Ethiopia, the rest of the African countries, the European Union, the United States of America, and the rest of the world. The overall result is trade creation for Ethiopia and a small amount for the rest of African countries, but no change to the other categories under the imperfect competition market.

Figure 22. Trade Creation and Diversion in Imperfect competition



Source: Own calculation from the GTAP output



Source: Own calculation from the GTAP output

The figure above indicates that trade creation for Ethiopian export products and the shift of imported product sources to African countries will happen. In the case of the rest of Africa, the small amount of change in trade created no trade diversion effects. Lastly, for the rest of the other countries, there are no trade creation or diversion effects.

6. Conclusion and Recommendation

6.1 Conclusion

Africa has commonly been an economically fractured market with limited trade integration in various corners of the continent and a low level of intra-regional trade among the countries. In 2021, intra-African trade within the continent accounted for only 14%, or nearly 71 billion USD. On March 21, 2018, in Rwanda, African leaders approved the African Continental Free Trade Area (AfCFTA). Currently, apart from Eritrea, all 54 African countries have signed the agreement, and 47 countries have ratified it.

The objective of the paper is to assess the impact of the African Continental Free Trade Area's (AfCFTA) implementation on Ethiopia's trade performance. The GTAP data base was employed in the study for static analysis for 2025, comparative statistics for 2025–2030 and full liberalization under perfect and imperfect competition markets. The research contributes by analyzing products from the Ethiopia Goods offer that are sensitive and non-sensitive, accounting for both perfect and imperfect competition. The study intends to ascertain the effects of the AfCFTA (gains or losses) on Ethiopia's economy and to pinpoint which sector will be most impacted once Ethiopia eliminates tariff and non-tariff barriers. The research employed the multi-sector and country-computable general equilibrium model developed by the Global Trade Policy Analysis to factor in the interactions of other African countries.

The main findings of the analysis for the comparative statistics showed an increase in GDP and welfare gains; the price of imports declined; and the price of exports was mixed, with an increase for agriculture in the early years and a decrease in 2030 and a decline in industrial products across years. Domestic output will increase due to enhanced production from domestic and import supplies. The quantity of imports is rising for all products except light and heavy manufacturing. On the other hand, the quantity of exports in manufacturing is increasing, but not in the agricultural sector. The price of endowments is decreasing, and government revenue is declining. Furthermore, trade creation occurs in the agriculture and manufacturing sector but not in the extraction sector. The trade diversion has tiny results

Finally, complete liberalization, whether under perfect competition or imperfect competition, both by Ethiopia and African countries, results in welfare improvement and a decrease in price for all imported and export products except agricultural items. Furthermore, there will be an increase in output for domestic, import, and export markets. The manufacturing

sector's contribution to trade creation and the overall sector's contribution to trade diversion are modest. While the impact of perfect and imperfect competition are alike, the influence of perfect competition is more pronounced than that of imperfect competition market.

6.2 Recommendation

The following is the suggested policy, which is based on the study's key findings:

- To effectively capitalize on the agreement, the government should increase production in both manufacturing and agriculture, thereby inducing a structural change within a competitive market scenario. At present, there is low output, limited trade, and a lack of product diversity.
- For the emerging sector to compete in the African market, it is imperative for policymakers to establish a robust strategy and accompanying programs.
- To augment overall production, the introduction of new industries is vital, along with the enhancement of the technological and financial capabilities of existing ones.
- The private sector needs to participate in this process to comprehend the agreement, adapt to it, and identify new partners for expanding operations.
- Comprehensive product-level examinations are required in each sector to identify the bottleneck and implement appropriate solutions.

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