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# Embracing the African Continental Free Trade Area: Unpacking Malawi's Economy Response to Trade Liberalization

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ABSTRACT

The impact of trade liberalization on Malawi's economy has been a hotly debated topic. To shed light on the subject, a study was conducted using the PEP-1–1 CGE model and the latest Malawi's Social Accounting Matrix (SAM) from 2019. The results were eye-opening, revealing the potential effects of the African Continental Free Trade Area (AfCFTA) on various sectors of the economy. The removal of trade tariffs is predicted to have a significant impact on prices, with a decrease of 26.31% in the agricultural sector alone, services (−7.88%), public administration (−9.92%), and manufacturing and industry (−11.23%) imposing hopes of improving food affordability and food security. However, it is expected to have adverse impacts on wage rates in the agricultural sector (−18.78%), manufacturing and construction (−19.01%), services (−2.79%) and public administration (−15.81%). Additionally, while exports are expected to increase, the country's balance of payments may suffer as imports are likely to outweigh foreign earnings. This could also lead to a decrease in government revenue from taxes. To mitigate these effects, the study suggests implementing export restructuring strategies, particularly in industries like manufacturing and construction, and promoting diversification of local production to boost competitiveness and improve wage rates. With these measures in place, the government will not only offset potential losses but also tap into new sources of taxable income.

## 1. Introduction

### 1.1. Background

According to experts, trade liberalization is considered a key factor in driving economic growth in today's world (World Bank, 2024). Over the past few decades, African nations have taken significant steps towards embracing global markets and harnessing the power of globalization for their own development. With the support of organizations like the World Bank and the IMF, these countries have implemented policies aimed at liberalizing trade, creating a more favorable environment for their agricultural industries to thrive on the global stage.

In recent years, the promotion of trade liberalization has taken center stage in Africa's pursuit of economic progress. This shift in policy orientation marks a significant turning point, with a strong focus on stimulating growth, enhancing competitiveness, and integrating African economies into the global marketplace (World Bank, 2019). As the continent continues to strive towards achieving its full economic potential, trade liberalization has become a key driver, with African countries actively pursuing regional trade agreements, reducing tariffs, and implementing market-oriented reforms (UNCTAD, 2018). These efforts are aimed at breaking down enduring barriers and unleashing the untapped potential of the region.

Trade liberalization in Africa has been driven by a variety of factors, with both domestic and external forces at play. While policymakers see it as a crucial tool for spurring domestic production and enticing foreign investment, there is also a growing pressure for African nations to open their economies to the global market. This has led to a surge in international trade agreements, as countries seek to boost economic growth, create job opportunities, and reduce poverty (African Development Bank, 2017). The rise of globalization has only fueled this push towards trade liberalization, with the belief that increased trade openness will bring about enhanced competitiveness and economic vitality (World Trade Organization, 2020).

The impact of trade liberalization in Africa is a highly debated topic, with conflicting opinions on its effectiveness and potential consequences (Nesongano, 2023). While some argue that opening trade can lead to efficiency, technological advancements, and economic growth, others

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**Table 1**
African Countries that are Import Sources for Malawi.

| Exporters | Share in value in Malawi's imports, % in 2019 | Share in value in Malawi's imports, % in 2020 | Share in value in Malawi's imports, % in 2021 |
|---|---|---|---|
| **South Africa** | 78.12 | 78.12 | 78.25 |
| **Tanzania** | 36.89 | 29.76 | 28.56 |
| **Mozambique** | 11.88 | 8.67 | 9.79 |
| **Zambia** | 18.18 | 17.15 | 20.01 |
| **Kenya** | 10.83 | 11.34 | 12.94 |
| **Nigeria** | 2.18 | 2.3 | 4.02 |
| **Egypt** | 3.15 | 4.45 | 6.89 |
| **Zimbabwe** | 9.84 | 8.93 | 8.3 |

**Source:** ITC Trade Map 2022.

**Table 2**
African Countries that are Export destinations for Malawi.

| Importers | Share in value in Malawi's exports, % in 2019 | Share in value in Malawi's exports, % in 2020 | Share in value in Malawi's exports, % in 2021 | Share in value in Malawi's exports, % in 2022 |
|---|---|---|---|---|
| **South Africa** | 48.68 | 55.19 | 60.39 | **15** |
| **Tanzania** | 16.8 | 13.56 | 7.83 | **22** |
| **Mozambique** | 19.78 | 23.65 | 27.98 | |
| **Zambia** | 34.69 | 22.31 | 27.21 | **10** |
| **Kenya** | 14.16 | 5.67 | 10.7 | **16** |
| **Nigeria** | 1.24 | 3.75 | 3.26 | |
| **Egypt** | 0.33 | 0.48 | 0.31 | |
| **Zimbabwe** | 18.13 | 12.79 | 15.27 | **15** |

**Source**: ITC Trade Map 2022.

believe it can worsen inequality, weaken domestic industries, and threaten food security, especially in vulnerable sectors like agriculture and manufacturing (Rodrick, 2020; Jayne et al., 2018). Therefore, it is crucial to thoroughly examine the evidence and provide valuable insights for policymakers in countries like Malawi, where trade policies can have a significant impact.

### *1.2. Malawi's Intra-Africa Trade: Opportunities and challenges*

Malawi has been actively embracing trade liberalization policies to foster its economic growth and development (Chirwa & Mhone, 2015). Being a landlocked nation in Southern Africa, Malawi faces unique obstacles in accessing international markets, making regional integration efforts crucial for its success (Kamwendo, 2017). Through its involvement in regional trade agreements such as the Southern African Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA), Malawi has established strong connections with other African countries, particularly those in the southern region. In fact, in 2022, Malawi's total trade with other African countries amounted to an impressive US$808 million, with intra-African trade accounting for 32 % of this total. Key trading partners within the continent include South Africa, Tanzania, Kenya, and Zambia, making up a significant 70 % of Malawi's intra-African trade.

However, Table 1 shows that the main import source of Malawi has been South Africa from 2019 up to 2021 accounting for more than 70 % of Malawi's imports. Malawi's intra-Africa trade remains relatively limited compared to its potential, with a significant portion of its exports still destined for markets outside the continent (Khoromana & Mwambene, 2018).

Table 2 provides a list of African countries that are export destination for Malawi. About 84 % of Malawi's products were exported to African countries between 2019–2021. Again, just like the imports, South Africa remains the main destination of Malawi's exports. This as well puts South Africa as Malawi's biggest trade partner, further predicting more trade because of the African Continental Free Trade Area. However, Table 2 further shows that in 2022, 7 % of Malawi's intra African trade accounted for African countries that are outside COMESA and SADC. Outside COMESA and SADC Malawi's main partners in trade were Nigeria and Morocco. Again, the statistics show that between 2019–2021, Nigeria's exports started increasing hinting a possible room for trade with countries outside COMESA and SADC.

Malawi's trade landscape is shaped by a variety of factors, including infrastructural constraints, trade barriers, and the overwhelming reliance on primary commodity exports (Mlenga & Ali, 2016). While the country's agriculture sector, particularly tobacco production, has been a key driver of its economy, it also presents challenges for diversification and adding value to its export portfolio (Kambala & Majamanda, 2020). However, there have been notable efforts in recent years to improve trade mechanisms and foster regional integration, with the goal of promoting intra-Africa trade (Arunatilake et al., 2020). One significant development in this regard is the ratification of the African Continental Free Trade Area (AfCFTA), which holds the potential to open new opportunities for Malawi in the African market (AfCFTA Secretariat, 2021). Yet, the question remains: to what extent will the implementation of AfCFTA address critical bottlenecks such as trade infrastructure deficits, cumbersome border procedures, and the need for product diversification and value addition in the country (Nkhoma & Phiri, 2019)? Only time will tell, but one thing is certain: the future of Malawi's trade lies in its ability to adapt and seize the potential of increased trade openness.

Malawi's economy is on the brink of significant change with the implementation of the AfCFTA. However, the success of this agreement in the country will depend on how well it responds to trade policies and utilizes its institutional capacity (Makoka et al., 2021). A key factor in this equation is the inclusion of special and differential treatment provisions for least developed countries, such as Malawi, within the AfCFTA. These provisions will ensure that Malawi can fully participate in and benefit from regional trade without facing disproportionate disadvantages (AUC, 2020). As Malawi delves into intra-Africa trade, it is faced with both opportunities and challenges that will greatly impact its economic development. While trade liberalization holds the potential to open new markets and drive growth, it is crucial for the country to address structural constraints and effectively leverage the benefits of this agreement in order to maximize its gains.

### *1.3. Trade liberalization in Malawi*

Malawi, like many other developing nations, has taken bold steps towards economic growth by embracing trade liberalization (Chirwa & Mhone, 2015). This involves breaking down barriers to international trade, such as tariffs, quotas, and regulations, to promote efficiency and competitiveness (Khoromana & Mwambene, 2018). The country's efforts towards trade liberalization have been guided by various regional and global partnerships, including its membership in economic communities like SADC and COMESA, as well as its commitment to multilateral trade agreements through the World Trade Organization (WTO) (Nyirenda & Chidoko, 2019).

Trade liberalization in Malawi has been accompanied by several policy reforms aimed at opening the economy to international trade and investment (Mlenga & Ali, 2016). These reforms include tariff reductions, trade facilitation measures, and the promotion of export-oriented industries (Kamwendo, 2017). The government has also implemented programs to enhance trade infrastructure, streamline customs procedures, and improve the business environment to attract foreign investment and promote export diversification (Arunatilake et al., 2020).

A couple of studies have examined the effects of trade liberalization, including the newly implemented AfCFTA (Obeng-Odoom, 2020). While the goal of the AfCFTA is to promote continental trade integration, experts like Obeng-Odoom (2020) raise concerns about the potential for increased inequality and mounting debt crises in Africa. Despite

predictions from UNCTAD (2018) that continental trade could increase by 52 percent, resulting in a potential $3 trillion boost to the continent's GDP, scholars remain skeptical of the distributional effects of such gains. In Malawi, researchers such as Kamwendo (2017), Khonje et al. (2022), Khoromana & Mwambene (2018), and Laryea et al. (2020) have examined the impacts of trade liberalization, highlighting both the opportunities and challenges it presents. They agree that Malawi is a net importer, but also has potential for exports in products like tobacco, soybeans, oil cake, tea, groundnuts, and sugarcane. However, these products are primarily raw materials, with lower export value compared to the processed goods that the country imports. According to Laryea et al. (2020), Malawi must undergo significant export restructuring to fully benefit from the AfCFTA. The authors also caution that larger regional players may dominate export markets, potentially leaving countries like Malawi at a disadvantage. While UNCTAD (2018) predicts a 1–3 percent increase in GDP for countries in the AfCFTA, it remains to be seen how different countries, each with their own comparative advantages, will fare under the agreement. A thorough, comprehensive analysis of each sector of the economy is needed to determine the true gains and losses for countries involved.

Trade liberalization has been a key element of Malawi's economic reform agenda, with the goal of boosting economic growth, integrating into the global market, and reducing poverty. While this approach has brought about significant benefits such as improved market access and increased export earnings, it has also presented challenges in terms of competitiveness, economic diversity, and social inclusion. As such, Malawi's policymakers must carefully balance the opportunities and risks of trade liberalization to ensure that its advantages are shared fairly and sustained over time. To achieve this, it is crucial to conduct a comprehensive study that examines the potential impact of the African Continental Free Trade Area (AfCFTA) on the country's economy and provide informed policy guidance. This study, through utilizing the Malawi 2019 Social Accounting Matrix and a Computable General Equilibrium model, aims to evaluate the effects of removing tariffs through the implementation of the AfCFTA. It assesses various aspects, including aggregate prices, labor and wages, consumption demand, output and incomes, and government revenue. The study assumes that approximately 75 % of commodities will experience a tariff reduction under the AfCFTA. While this may seem like a high estimate, it is worth noting that over 90 % of Malawi's trade is conducted within the region. Therefore, the simulation results are likely to align with this assumption (Decaluwe et al., 2013; Nesongano, 2023). However, it is essential to acknowledge that some commodities may still be exported/imported to/from other regions, such as Europe and Asia.

## 2. Methodology

This section provides a description of the data and the model used in the assessment of the impact of trade liberalization on Malawi's economy. The section first starts with presenting the recent Malawi's Social Accounting Matrix (SAM), which provides the majority of the data for the model used. The section further dis-integrates the trade data for Malawi from the SAM, narrating the detailed structure of Malawi's trade. Lastly, the section provides a detailed description of the PEP-1–1 model and the simulations imposed. All ethical considerations were followed in carrying the research.

### 2.1. Theoretical context

A number of trade theories exist that have shaped the formulation of trade agreements in the world. Trade theories like the theory of comparative advantage, the gravity model, and the Heckscher-Ohlin model have all guided countries to form trade agreements to ensure that they attain economic development.

The theory of comparative advantage, which was first proposed by the economist David Ricardo, suggests that countries should specialize in producing goods and services they can produce at a lower opportunity cost and trading for those at a higher opportunity cost. By engaging in trade based on their comparative advantages, countries can maximize their overall welfare. For instance, Eze and Aras (2022) reported that Nigeria has a comparative advantage in the export of raw materials but has a comparative disadvantage in the export of intermediate goods, consumer goods and capital goods. As such, compared to Ghana and South Africa, Nigeria can profitably export raw materials to AfCFTA trade partners. Similarly, Simola et al. (2021) adopts the theory of comparative advantage to assess the potential gains from intra-African trade, particularly the agri-food sector, and reported that African trade is predicted to expand in terms of total volume resulting into food availability and improved food security in the region.

The gravity model of trade suggests that the volume of trade between two countries is positively related to their GDP's and negatively related to the distance between them (Bergstrand et al., 2024). In other words, the model stipulates how much a country will trade goods and services with another depends on the size of their economies and the distance between those two countries. The larger their economic size and the shorter the distance between them, the larger the volume of trade between those two countries. Likewise, AfCFTA aims to unlock the vast potential of Africa's market by creating a single, unified market for 1.3 billion consumers across 45 plus countries, with a combined GDP of $3.4 trillion (World Bank, 2020). By reducing costs associated with distance and fostering economies of scale, AfCFTA seeks to boost intra-continental trade and investment, driving deeper economic integration and growth across Africa.

The Heckscher-Ohlin theory states that countries will export goods that use their abundant and cheap factors of production and import goods that use their scarce factors. This suggests that a capital-abundant country will export products from its capital-intensive industries to labour-abundant countries, and the labour-abundant countries buy capital-intensive goods and will in return export labour-intensive products to the capital-abundant countries. For African countries, the Heckscher-Ohlin model suggests countries with abundant natural resources may specialize in the production and export of primary commodities to capital-rich developed countries. AfCFTA through its main objective of eliminating barriers, enables countries to specialize in producing goods that use their abundant factors, increasing efficiency and trade.

#### 2.1.1. Positioning AfCFTA in trade agreements

Traditional trade agreements mainly consist of bilateral or a few countries, rather than a continental wide-arrangement and they are mostly limited to specific goods. For instance, bilateral trade agreements between Malawi and Botswana cover some goods wholly obtained and manufactured in either country, which are traded on a reciprocally duty-free basis (MITC, 2024). On the other hand, the AfCFTA is continental and covers comprehensive coverage of all goods and services. Further, AfCFTA differs from the traditional trade agreements by not only reducing tariffs but also liberalizing trade in services. This is significant because services drive approximately 60 % of Africa's GDP and comprised 30 % of global trade in 2014 (ITC, 2022). The services also play a vital role in production processes, facilitating trade in goods unlike under traditional agreements. Consequently, the AfCFTA has the potential to eradicate poverty and inequality trends and spur sustainable and inclusive growth on the continent when it follows its mandate path (UNCTAD, 2021).

While the AfCFTA and Regional Economic Communities (RECs) like SADC, COMESA and ECOWAS do share similar objectives of promoting economic growth and development, there are some key differences between them. First, is the scope and membership. AfCFTA is a continental initiative aimed at creating a single market for goods and services across the African member union states (55 countries). In contrast, RECs such as COMESA, ECOWAS and SADC are limited to specific regions within Africa. For instance, SADC consists of 16 member states which are all

**Table 3**
The Malawi Social Accounting Matrix in 2019 in Billion Malawi Kwacha.

| | **Activities** | **Commodities** | **Factors** | Firms | Households | Govt | Taxes | Investment | Rest of the World | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Activities | | 14,549 | | | 692 | | | | | 15,241 |
| Commodities | 7,518 | 3,094 | | 962 | 4,916 | 644 | | 2,474 | 1,100 | 20,707 |
| Factors | 7,723 | | | | | | | | 8 | 7,731 |
| Firms | | | 3,148 | 743 | | | | | | 4,324 |
| Households | | | 4,372 | 2,009 | | | | | | 6,675 |
| Govt | | | | 8 | | | | | | 1,105 |
| Taxes | | 492 | | 160 | 302 | | | | | 953 |
| Savings | | | | | 439 | 723 | 173 | | | 2,474 |
| Rest of the World | | 2,572 | | | | | | | | 2,801 |
| Total | 15,241 | 20,707 | 7,731 | 4,324 | 6,675 | 1,105 | 953 | 2,474 | 2,801 | |

**Source:** IFPRI (2023).

from Southern Africa. Second, AfCFTA's primary objective is to eliminate tariffs on intra-African trade, thereby boosting trade and investments across the continent. As for the RECs, they often have a broader mandate that includes not only trade but also political and security cooperation, infrastructure development, and social policies. For instance, ECOWAS was formed in the 20th century to promote multidimensional cooperation that will bring peace and security to the West African states (Ani & Amusan, 2016). Thus, the current AfCFTA provides novel opportunities and challenges to the continent's economic development that are different from the traditional trade agreements.

### *2.2. Data sources*

#### *2.2.1. The Social Accounting Matrix*

The study anchored its analysis on the 2019 Malawi Social Accounting Matrix (SAM) which is the recent SAM that the country has (IFPRI, 2023). A SAM provides a detailed summary of a county's national accounts which are information about the economic transactions in a given country. It is a square matrix that provides information about all institutional agents in the country as they all play a role as both buyers and sellers in the economy (Nesongano, 2023). The columns in the SAM present the expenditure by that agent and rows represent incomes going to that agent. Institutional agents include Households, firms, government and rest of the economy. The SAM offers a comprehensive framework for understanding the intricate interplay of various sectors and factors within the economy. The model provides a robust foundation for analysis. Moreover, the segmentation of households into urban and rural categories, and based on their education levels adds granularity to the assessment. Table 3 presents the data used in the study which is the 2019 SAM in billion Malawi Kwacha.

#### *2.2.2. Structure of Malawi's trade*

Malawi's trade structure is characterized by various factors, including its export and import composition, trading partners, and trade policies. Analyzing these aspects provides insights into the country's trade dynamics and its position in the global market.

Malawi's export base is primarily composed of agricultural commodities, with tobacco being the leading export product. According to the Malawi Revenue Authority (MRA, 2021), other significant export commodities include tea, sugar, and legumes. These agricultural products account for a substantial portion of Malawi's export revenue and play a vital role in the country's economy.

In contrast, Malawi's imports consist of a diverse range of goods, including machinery, equipment, petroleum products, and consumer goods. The country relies heavily on imports to meet its domestic demand for capital goods, fuel, and various consumer products. The Malawi National Statistical Office (NSO, 2020) reports that machinery and equipment, vehicles, and refined petroleum are among the top imported goods.

With regards to its trading partners, Malawi's trade is largely

**Table 4**
Structure of production and trade in Malawi.

| | **Share of total (%)** | | | **Exports/ output (%)** | **Imports/ demand (%)** |
|---|---|---|---|---|---|
| | **GDP** | **Exports** | **Imports** | | |
| **All sectors or commodities** | 100 | 100 | 100 | 7.6 | 14.2 |
| **Agriculture** | 24.4 | 34.4 | 2.4 | 17.8 | 2.9 |
| Crops | 21.0 | 34.3 | 2.3 | 23.0 | 3.6 |
| Livestock | 1.9 | 0.0 | 0.0 | 0.2 | 0.4 |
| Forestry | 0.1 | 0.0 | 0.0 | 0.5 | 0.4 |
| Fisheries | 1.4 | 0.1 | 0.1 | 0.3 | 1.2 |
| **Industry** | 19.7 | 50.3 | 85.2 | 11.5 | 26.9 |
| Mining | 0.8 | 1.7 | 0.4 | 18.4 | 9.6 |
| Manufacturing | 12.3 | 48.7 | 84.9 | 20.0 | 37.1 |
| Processed foods | 6.4 | 7.6 | 2.9 | 4.8 | 3.4 |
| Beverage and tobacco | 1.6 | 30.1 | 0.5 | 121.7 | 8.7 |
| Textiles, clothing, and footwear | 0.5 | 3.7 | 2.1 | 32.4 | 26.5 |
| Wood and paper products | 0.4 | 0.2 | 6.4 | 3.0 | 58.9 |
| Chemicals and petroleum | 2.6 | 5.6 | 25.9 | 18.1 | 55.0 |
| Non-metal minerals | 0.1 | 0.0 | 3.5 | 0.0 | 61.8 |
| Metals and metal products | 0.3 | 1.5 | 10.4 | 44.5 | 72.8 |
| Machinery, equipment, and vehicles | 0.1 | 0.0 | 30.8 | 0.0 | 69.6 |
| Other manufacturing | 0.3 | 0.0 | 2.4 | 0.0 | 27.7 |
| Electricity, gas, and steam | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| Water supply and sewage | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Construction | 3.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Services** | 55.8 | 15.2 | 12.3 | 2.2 | 4.1 |
| Wholesale and retail trade | 13.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Accommodation and food services | 1.5 | 6.2 | 2.2 | 24.1 | 20.9 |
| Transportation and storage | 4.9 | 1.7 | 3.1 | 2.1 | 8.2 |
| Information and communication | 6.0 | 3.3 | 0.7 | 5.1 | 2.8 |
| Finance and insurance | 5.7 | 2.7 | 1.1 | 4.3 | 4.0 |
| Real estate activities | 7.2 | 0.0 | 0.2 | 0.0 | 0.6 |
| Business service | 1.4 | 0.4 | 1.9 | 1.2 | 12.6 |
| Public administration | 3.0 | 0.5 | 0.9 | 1.3 | 5.3 |
| Education | 4.7 | 0.1 | 1.3 | 0.2 | 4.3 |
| Health and social work | 6.0 | 0.0 | 0.1 | 0.0 | 0.4 |
| Other services | 2.0 | 0.4 | 0.8 | 2.0 | 8.5 |

**Source:** 2019 Malawi SAM (IFPRI, 2023).

oriented towards regional and international markets. The country's main trading partners include neighboring countries within the Southern African Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA). South Africa, Zambia, and Tanzania are among Malawi's key trading partners, with significant volumes of bilateral trade occurring between these countries (World Bank, 2021).

The country has implemented various trade policies and initiatives to facilitate trade and enhance its competitiveness in the global market. The government has actively participated in regional trade agreements such as SADC and COMESA to promote regional integration and facilitate trade with neighboring countries. Additionally, Malawi has pursued trade liberalization measures aimed at reducing tariffs, simplifying customs procedures, and improving trade facilitation mechanisms (Ministry of Industry, Trade, and Tourism, 2018).

Thus, Malawi's trade structure reflects its dependence on agricultural exports and its reliance on imports to meet domestic demand for various goods and services. The country's trade policies and trading partnerships play a crucial role in shaping its trade dynamics and economic development trajectory. Continued efforts to diversify exports, enhance trade facilitation, and promote regional integration will be essential for Malawi to leverage its trade potential and achieve sustainable economic growth (UNCTAD, 2020) Table 4.

### 2.3. PEP-1–1 Computable General Equilibrium model

The study used a PEP-1–1 (one period – one country) model which was developed by Decaluwé et al. (2013). The model is a standard Computable General Equilibrium (CGE) single country designed to model industry effects but at the same time tracking differences in trade patterns, in this case resulting from AfCFTA. The model provides a better fit in assessing the impact of a country's trade reforms on a number of elements including production, prices, exports, imports and incomes (Nesongano, 2023). The model is calibrated based on the 2019 Malawi SAM which has been modified to have 30 sectors; four factors of production (skilled labour, unskilled labour, capital and land); and households which are categorized into rural and urban households. Following Decaluwé et al. (2013), the PEP-1–1 standard CGE can be presented by some of the following selected equations[1]:

Production

$$VA_{j,t} = v_j XST_{j,t} \tag{1}$$

$$CI_{j,t} = io_j XST_{j,t} \tag{2}$$

$$VA_{j,t} = B_j^{VA}\left[\beta_j^{VA} LDC_{j,t}^{-\rho_j^{VA}} + \left(1-\beta_j^{VA}\right) KDC_{j,t}^{-\rho_j^{VA}}\right]^{-\frac{1}{\rho_j^{VA}}} \tag{3}$$

$$LDC_{j,t} = \left[\frac{B_j^{VA}}{1-B_j^{VA}}\frac{RC_{j,t}}{WC_{j,t}}\right]^{\sigma_j^{VA}} KDC_{j,t} \tag{4}$$

$$LDC_{j,t} = B_j^{LD}\left[\sum_I \beta_{i,j}^{LD} LD_{l,j,t}^{-\rho_j^{LD}}\right]^{-\frac{1}{\rho_J^{LD}}} \tag{5}$$

$$LD_{i,j,t} = \left[\frac{\beta_{i,j}^{LD} WC_{j,t}}{WTI_{i,j,t}}\right]^{\sigma_j^{LD}} (B_j^{LD})^{\sigma_j^{LD}-1} LDC_{j,t} \tag{6}$$

$$KDC_{j,t} = B_j^{KD}\left[\sum_k \beta_{k,j}^{KD} kD_{k,j,t}^{-\rho_j^{kD}}\right]^{-\frac{1}{\rho_j^{kD}}} \tag{7}$$

$$KD_{k,j,t} = \left[\frac{\beta_{k,j}^{KD} RC_{j,t}}{RTI_{k,j,t}}\right]^{\sigma_j^{KD}} (B_j^{KD})^{\sigma_j^{KD}-1} KDC_{j,t} \tag{8}$$

$$DI_{i,j,t} = aij_{i,j} CI_{j,t} \tag{9}$$

Households

$$H_{h,t} = YHL_{h,t} + YHK_{h,t} + YHTR_{h,t} \tag{10}$$

$$YHL_{h,t} = \sum_l \lambda_{h,l}^{WL}\left(W_{i,t}\sum_j LD_{i,j,t}\right) \tag{11}$$

$$YHK_{h,t} = \sum_k \lambda_{h,k}^{RK}\left(\sum_j R_{k,j,t} KD_{k,j,t}\right) \tag{12}$$

$$YHTR_{h,t} = \sum_{ag} TR_{h,a,g,t} \tag{13}$$

Firms

$$YF_{f,t} = YFK_{f,t} + YFTR_{f,t} \tag{14}$$

$$YFK_{f,t} = \sum_k \lambda_{f,t}^{RK}\left(\sum_j R_k, j, tKD_{k,j,t}\right) \tag{15}$$

$$YFTR_{f,t} = \sum_{ag} TR_{f,ag,t} \tag{16}$$

$$YDF_{f,t} = YF_{f,t} - TDF_{f,t} \tag{17}$$

$$SF_{f,t} = YDF_{f,t} - \sum TR_{ag,f,t} \tag{18}$$

Government

$$YG_t = YGK_t + TDHT_t + TDFT_t + TPRODN_t + TPRCTS_t + YGTR_t \tag{19}$$

Rest of the world

$$YROW_t = e_t\sum_t PWM_{i,t} IM_{i,t} + \sum_k \lambda_{row,k}^{RK}\left(\sum_j R_{k,j,t} KD_{k,j,t}\right) + \sum_{agd} TR_{row,agd,t} \tag{20}$$

$$SROW_t = YROW_t - \sum_t PE_{i,t}^{FOB} EXD_{i,t} - \sum_{agd} TR_{agd,row,t} \tag{21}$$

$$SROW_t = -CAB_t \tag{22}$$

Transfers

$$R_{agng,h,t} = \lambda_{agng,h}^{TR} YDH_{h,t} \tag{23}$$

$$TR_{gvt,h,t} = PIXCON_t^{\eta}\, tr0_{h,t} + tr1_{h,t} YH_{h,t} \tag{24}$$

$$TR_{ag,f,t} = \lambda_{ag,f}^{TR}\, YDF_{f,t} \tag{25}$$

$$TR_{agng,gvt,t} = PIXCON_t^{\eta}\, TR_{agng,gvt}^{0}\, pop_t \tag{26}$$

$$TR_{agd,row,t} = PIXCON_t^{\eta}\, TR_{agd,row}^{0}\, pop_t \tag{27}$$

Demand

$$PC_{i,t}\, C_{i,h,t} = PC_{i,t}\, C_{i,h,t}^{MIN} + \gamma_{i,h}^{LES}\left(CTH_{h,t} - \sum_{ij} PC_{ij,t}\, C_{ij,h,t}^{MIN}\right) \tag{28}$$

$$GFCF_t = IT_t - \sum_i PC_{i,t}\, VSTK_{i,t} \tag{29}$$

Producer supplies of products and international Trade

[1] All the equations adopted from Decaluwé et al. (2013).

$$XST_{j,t} = B_j^{XT}\left[\sum_i \beta_{j,i}^{XT}\, XS_{j,i,t}^{\rho_j^{XT}}\right]^{\frac{1}{\rho_j^{XT}}} \tag{30}$$

$$XS_{j,i,t} = \frac{XST_{j,t}}{(B_j^{XT})^{1+\sigma_j^{XT}}}\left[\frac{P_{j,i,t}}{\beta_{j,i}^{XT}\, PT_{j,t}}\right]^{\sigma_j^{XT}} \tag{31}$$

$$XS_{j,i,t} = B_{j,i}^{X}\left[\beta_{j,i}^{X}\, EX_{j,i,t}^{\rho_{j,x}^{X}}\right]^{\frac{1}{\rho_{j,i}^{X}}} \tag{32}$$

$$EX_{j,i,t} = \left[\frac{1-\beta_{j,i}^{X}}{\beta_{j,i}^{X}}\,\frac{PE_{i,t}}{PL_{i,t}}\right]^{\sigma_{j,i}^{X}} DS_{j,i,t} \tag{33}$$

$$EXD_{i,t} = EXD_i^{O}\, pop_t\left(\frac{e_t\, PWX_{i,t}}{PE_{i,t}^{FOB}}\right)^{\sigma_i^{XD}} \tag{34}$$

$$Q_{i,t} = B_i^{M}\left[\beta_i^{M} IM_{i,t}^{-\rho_i^{M}} + \left(1-\beta_i^{M}\right) DD_{i,t}^{-\rho_i^{M}}\right]^{\frac{-1}{\rho_i^{M}}} \tag{35}$$

$$IM_{i,t} = \left[\frac{\beta_i^{M}}{1-\beta_i^{M}}\,\frac{PD_{i,t}}{PM_{i,t}}\right]^{\sigma_i^{M}} DD_{i,t} \tag{36}$$

International trade

$$PT_{j,t} = \frac{\sum_i P_{j,i,t}\, XS_{j,i,t}}{XST_{j,t}} \tag{37}$$

$$P_{j,i,t} = \frac{PE_{i,t} EX_{j,i,t} + PL_{i,t} DS_{j,i,i}}{XS_{j,i,t}} \tag{38}$$

$$PE_{i,t}^{FOB} = \left(PE_{i,t} + \sum_{ij} PC_{ij,t}\, tmrg_{ij,i}^{X}\right)\left(1 + ttix_{i,t}\right) \tag{39}$$

$$PD_{i,t} = (1 + ttic_{i,t})(PL_{i,t} + \sum_{ij} PC_{ij,t}\, tmrg_{ij,i}) \tag{40}$$

$$PM_{i,t} = \left(1 + ttic_{i,t}\right)\left(1 + ttim_{i,t}\right) e_t PWM_{i,t} + \sum_{ij} PC_{ij,t}\, tmrg_{ij,i}) \tag{41}$$

$$PC_{i,t} = \frac{PM_{i,t} IM_{i,t} + PD_{i,t} DD_{i,t}}{Q_{i,t}} \tag{42}$$

International Trade

$$Q_{i,t} = \sum_h C_{i,h,t} + CG_{i,t} + INV_{i,t} + VSTK_{i,t} + DIT_{i,t} + MRGN_{i,t} \tag{43}$$

$$\sum_j LD_{l,j,t} = LS_{l,t} \tag{44}$$

$$\sum_j KD_{k,j,t} = KS_{k,t} \tag{45}$$

$$IT_t = \sum_h SH_{h,t} + \sum_f SF_{f,t} + SG_t + SROW_t \tag{46}$$

$$IT_t^{PRI} = IT_t - IT_t^{PUB} - \sum_i PC_{i,t} VSTK_{i,t} \tag{47}$$

$$\sum_j DS_{j,i,t} = DD_{i,t} \tag{48}$$

$$\sum_j EX_{j,i,t} = EXD_{i,t} \tag{49}$$

Where:

$C_{i,h,t}$ : $Concumptionofcommodityibythetypehhouseholds$

$C_{i,h,t}^{MIN}$ : $Minimumconsumptionofcommodityibytypehhouseholds$

$CG_{i,t}$ : $Publicconsumptionofcommodityi(volume)$

$CI_{j,t}$ : $Totalintermediateconsumptionofindustryj$

$DD_{i,t}$ : $Domesticdemandforcommodityiproducedlocally$

$DI_{i,j,t}$ : $Intermediateconsumptionofcommodityibyindustryj$

$DIT_{i,t}$ : $Totalintermediatedemandforcommodityi$

$DS_{j,i}$ : $Supplyofcommodityibysectorjtothedomesticmarket$

$EX_{j,i,t}$ : $Quantityofproductiexportedbysectorj$

$EXD_{i,t}$ : $Worlddemandforexportsofproducti$

$IM_{i,t}$ : $Quantityofproductiimported$

$IND_{k,pub,t}$ : $Volumeofnewtypekcapitalinvestmenttosectorpub$

$INV_{i,t}$ : $Finaldemandofcommodityiforinvestmentpurposes$

$INV_{i,t}^{PRI}$ : $Finaldemandofcommodityiforprivateinvestmentpurposes$

$INV_{i,t}^{PUB}$ : $Finaldemandofcommodityiforpublicinvestmentpurposes$

$KD_{k,j,t}$ : $Demandfortypekcapitalbyindustryj$

$KDC_{j,t}$ : $Industryjdemandforcompositecapital$

$KS_{k,t}$ : $Supplyoftypekcapital$

$LD_{i,j,t}$ : $Demandfortypellaborbyindustryj$

$LDC_{j,t}$ : $industryjdemandforcompositelabor$

$LS_{i,t}$ : $Supplyoftypellabor$

$MRGN_{i,t}$ : $Demandforcommodityiasatradeortransportmargin$

$Q_{i,t}$ : $Quantitydemandedofcompositecommodityi$

$VA_{j,t}$ : $Valueaddedofindustryj$

$VSTK_{i,t}$ : $Inventorychangeofcommodityi$

$XS_{j,i,t}$ : $industryjproductionofcommodityi$

$XST_{j,t}$ : $Totalaggregateoutputofindustryj$

$CAB_t$ : $Currentaccountbalance$

$CTH_{h,t}$ : $Consumptionbudgetoftypehhouseholds$

$G_t$ : $Currentgovernmentexpenditureson goodsandservices$

$GDP_t^{BP}$ : $GDPatbasicpricesGDP_t^{FD}$
: $GDPatpurchasers'pricesfromtheperspectiveoffinaldemand$

$GDP_t^{IB}$ : $GDPatmarketprices(incomebased)$

$GDP_t^{MP}$ : $GDPatmarketprices$

$GFCF_t$ : $Grossfixedcapitalformation$

$IT_t$ : $totalinvestmentexpenditures$

$IT_t^{PRI}$ : $Totalprivateinvestmentexpenditures$

$IT_t^{PUB}$ : $Totalpublicinvestmentexpenditures$

$SF_{f,t}$ : $savingsoftypefbusinesses$

$SG_t$ : $Governmentsavings$

$SH_{h,t}$ : $Savingsoftypehhouseholds$

$SROW_t$ : $Rest - of - theworldsavings$

$TDF_{f,t}$ : $incometaxesoftypefbusinesses$

$TDFT_t$ : $totalgovernmentrevenuefrombusinessincometaxes$

$TDH_{h,t}$ : $Incometaxesoftypehhouseholds$

$TDHT_t$ : $Totalgovernmentrevenuefromhouseholdincometaxes$

$TIC_{i,t}$ : $Governmentrevenuefromindirecttaxesonproducti$

$TICT_t$ : $Totalgovernmentreceiptsofindirecttaxesoncommodities$

$TIK_{k,j,t}$ : $Governmentrevenuefromtaxesontypekcapitalusedbyindustryj$

$TIKT_t$ : $Totalgovernmentrevenuefromtaxesoncapital$

$TIM_{i,t}$ : $Governmentrevenuefromimportdutiesonproducti$

$TIMT_t$ : $Totalgovernmentrevenuefromimportduties$

$TIP_{j,t}$ : $Governmentrevenuefromtaxesonindustryjproduction$

$(excludingtaxesdirectlyrelatedtotheuseofcapitalandlabor)$

$TIPT_t$ : $Totalgovernmentrevenuefromproductiontaxes$

$(excludingtaxesdirectlyrelatedtotheuseofcapitalandlabor)TIW_{l,j,t}$
: $Governmentrevenuefrompayrolltaxesontypellaborinindustryj$

$TIWT_t$ : $Totalgovernmentrevenuefrompayrolltaxes$

$TIX_{i,t}$ : $Governmentrevenuefromexporttaxesonproducti$

$TIXT_t$ : $Totalgovernmentrevenuefromexporttaxes$

$TPRCTS_t$ : $Totalgovernmentrevenuefromtaxesonproductsandimports$

$TPRODN_t$ : $Totalgovernmentrevenuefromothertaxesonproduction$

$TR_{ag,agj,t}$ : $Transfersfromagentagjtoagentag$

$YDF_{f,t}$ : $Disposableincomeoftypefbusinesses$

$YDH_{h,t}$ : $Disposableincomeoftypehhouseholds$

$YF_{f,t}$ : $Totalincomeoftypefbusinesses$

$YFK_{f,t}$ : $Capitalincomeoftypefbusinesses$

$YFTR_{f,t}$ : $Transferincomeoftypefbusinesses$

$YG_t$ : $Totalgovernmentincome$

$YGK_t$ : $Governmentcapitalincome$

$YGTR_t$ : $Governmenttransferincome$

$YH_{h,t}$ : $Totalincomeoftypehhouseholds$

$YHK_{h,t}$ : $Capitalincomeoftypehhouseholds$

$YHL_{h,t}$ : $Laborincomeoftypehhouseholds$

$YHTR_{h,t}$ : $Transferincomeoftypehhouseholds$

$YROW_t$ : $Rest - of - the - worldincome$

The standard One country – One period CGE model assumes that the business enterprises (firms) in the country operate in a perfect competitive market. This means that the markets for factors of production, goods and services and foreign exchange all respond to the forces of demand and supply, and these are affected by government policies, the external environment and other exogenous factors (Dixon & Jorgenson, 2012). Decaluwe et al. (2013) further argues that firms are profit maximizing agents subject to their production technology, and thus takes prices of the inputs as given by the market.

Furthermore, production technology is presented through the Leontief functions and Constant Elasticity of Substitution (CES). Nonetheless, total intermediate consumption and value-added inputs are complementary. In this case, intermediate demand by all sectors is again presented through Leontief functions. In this case, all the commodities that are produced in the country are sold through the market, and the corresponding inputs of production are presented as CES functions of

**Table 5**
Household Income Sources in Malawi (2019).

| Share of total household income (%) Labor by education level | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | All workers | Low educated | Medium educated | High educated | Crop land | capital all | agriculture | Non agriculture | transfers World | government | total 100 |
| **All households** | 43.9 | 6.9 | 23.1 | 13.9 | 14.8 | 36.9 | 6.8 | 30.1 | 1.1 | 3.3 | 100 |
| **Quintile 1** | 49.1 | 36.8 | 11.2 | 1.2 | 31.2 | 18.7 | 11.9 | 6.8 | 0.0 | 1.0 | 100 |
| **Quintile 2** | 40.6 | 23.7 | 14.8 | 2.0 | 30.9 | 26.3 | 15.4 | 10.9 | 0.0 | 2.1 | 100 |
| **Quintile 3** | 37.9 | 13.0 | 21.5 | 3.4 | 30.4 | 29.0 | 14.4 | 14.7 | 0.2 | 2.5 | 100 |
| **Quintile 4** | 39.1 | 7.1 | 26.8 | 5.2 | 20.8 | 36.1 | 10.0 | 26.2 | 0.3 | 3.7 | 100 |
| **Quintile 5** | 46.1 | 1.6 | 24.2 | 20.2 | 7.5 | 41.1 | 3.4 | 37.8 | 1.6 | 3.7 | 100 |
| **Rural households** | 33.8 | 10.1 | 18.7 | 5.0 | 23.7 | 38.1 | 11.2 | 26.9 | 1.0 | 3.5 | 100 |
| **Urban households** | 57.3 | 2.7 | 28.9 | 25.7 | 2.3 | 35.4 | 1.0 | 34.4 | 1.2 | 3.1 | 100 |

**Source:** Malawi SAM (IFPRI, 2023).

**Table 6**
Household Populations and Expenditures in Malawi (2019).

| Population | | | Consumption spending | | | Total spending | |
|---|---|---|---|---|---|---|---|
| | Millions of people | Share of Total (%) | Share of Total (%) | Per capita (1000 CFA Franc) | Food Share (%) | Per capita (1000 CFA Franc) | Savings Rate (%) |
| All households | **18.6** | **100** | **100** | **301** | **59.5** | **358** | **10.8** |
| Quintile 1 | 3.7 | 20.0 | 5.6 | 84 | 71.1 | 86 | 2.9 |
| Quintile 2 | 3.7 | 20.0 | 7.9 | 119 | 70.2 | 125 | 4.3 |
| Quintile 3 | 3.7 | 20.0 | 11.8 | 178 | 67.9 | 188 | 4.8 |
| Quintile 4 | 3.7 | 20.0 | 17.2 | 259 | 67.2 | 288 | 8.5 |
| Quintile 5 | 3.7 | 20.0 | 57.5 | 866 | 52.8 | 1,105 | 13.8 |
| Rural households | **15.7** | **84.4** | **59.8** | **213** | **66.7** | **243** | **8.6** |
| Urban households | **2.9** | **15.6** | **40.2** | **776** | **48.7** | **981** | **13.9** |

**Source:** Malawi SAM (IFPRI, 2023).

capital and labour. Through small-country assumptions, both domestic prices of imports and exports are presented in their respective foreign prices (Dixon & Jorgenson, 2012). Most importantly, domestic commodity prices of all imports and exports are a combination of indirect taxes and producer prices. As such, the AfCFTA presents a scenario where the removal of trade tariffs has a bearing on that compound price (Kamwendo, 2017). On the other hand, export price in this case is inherently affected by input price which determine output prices. Commodities produced are both consumed locally and exported, and production for one market is not the same for another market. Such imperfect substitutability is portrayed through Constant Elasticity of Transformation (CET) (Decaluwé et al., 2013).

Again, the Linear Expenditure System (LES) is derived by assuming that households have Stone-Geary Utility functions (IFPRI, 2023). The good thing with the Stone-Geary utility function is that it allows for zero consumption for the commodities. Most importantly, Geary Utility functions are superior to the popular Cobb Douglas utility functions as they neither impose zero cross-price elasticities nor unitary income elasticities for the commodities in the SAM.

Lastly, the PEP-1–1 CGE allows for other institutions in its framework which includes the government, businesses and the rest of the world. To start with the government, it receives income from commodities, institutions and activities through taxes. This strongly implies that the removal of taxes will have a bearing on its income. The government spends its income on commodities and transfers to institutions. For the business enterprises, they receive money from capital and transfers from other institutions, and spend it through transfer to other institutions and taxes to government.

## 3. Results

### 3.1. Descriptive statistics

Table 5 shows a share of total household income in Malawi broken down from different sources of income and various household groups. The sources of income are, labor divided into three education-based groups; low education representing those who did not complete primary school (0—6 years of schooling), medium education for those who completed primary school (7 – 11 years of schooling) and high education for those who completed secondary or tertiary school (12 + years of schooling). Capital is presented as the gross operating surplus and a portion of mixed income not assigned to labor and land factors, explaining why income from crop land goes directly to households. The last source, transfers from the rest of the world and government go directly to households' income. The households, rural and urban, are further disaggregated into 5 quintiles with each quintile representing 20 % of the respective rural and urban populations.

The overall labor income significantly contributes (43.9 %) to the total household income. There is a noticeable variation in income across the education levels with low-educated workers contributing 6.9 %, medium-educated workers contributing 23.1 % and high-educated workers contributing 13.9 %. This suggests that higher levels of education are associated with higher contributions to the household income from labor. The table also shows income form crop land and capital making significant contributions to the total household income accounting for 14.8 % and 36.9 % respectively. World and government transfers contribute to total household income by 1.1 % and 3.3 % respectively.

Comparing income distribution across the household quintiles with quintile 1 representing the poorest households and quintile 5 representing the wealthiest household; it shows that quintile 1 depends more on low-educated labor (36.8 %) and less on high educated labor (1.2 %) compared to other quintiles. It also shows that quintile 1 obtains its highest share of income from crop land (31.2 %) indicating its heavy reliance on agricultural income as compared to the other quintiles. This is mainly because a majority of rural Malawians are smallholder farmers with low educated levels and mostly work in the agricultural sector, providing unskilled labour in smallholder farms. Quintile 5 on the other hand relies more on capital income (41.1 %) and a huge share of its capital income is obtained from non-agriculture activities (37.8 %). Quintile 5 also obtains a higher share of its income from transfers (4.8 %) as compared to the other quintiles. Overall, urban households across all the income quintiles receive a greater share of income from labor (57.3 %) as compared to the rest of income sources.

Table 6 provides information on household populations and expenditures in Malawi for the year 2019, disaggregated across different household groups. Consumption spending includes all spending on goods and services while total spending accounts for all consumption spending plus taxes, savings and other outward remittances.

Overall, the table shows that Malawi had a total household population of 18.6 million people with the rural households making the largest share of the population (84.4 %) as compared to urban households (15.6 %). The households are further disaggregated into 5 quintiles where quintile 1 represents the poorest household and quintile 5 represents the wealthiest household.

Collectively, all households spent 100 % of their total spending on consumption with the food share accounting for 59.5 % and their per capita total being 301,000 CFA Francs.[2] As we move up the quintiles, per capita consumption spending increases while the food consumption share decreases. Quintile 5 has the lowest food share (52.8 %) but the largest per capita share with 866,000 CFA Francs compared to the other quintiles. Rural households also had the largest food share (66.7 %) but the least per capita consumption spending, at 213,000 CFA Francs, compared to urban households.

The table also shows the total household spending for all households (358,000 CFA Francs), with only 10.8 % allocated to the savings.

[2] The currency as presented in the 2019 SAM for proper comparisons with other SAMs.

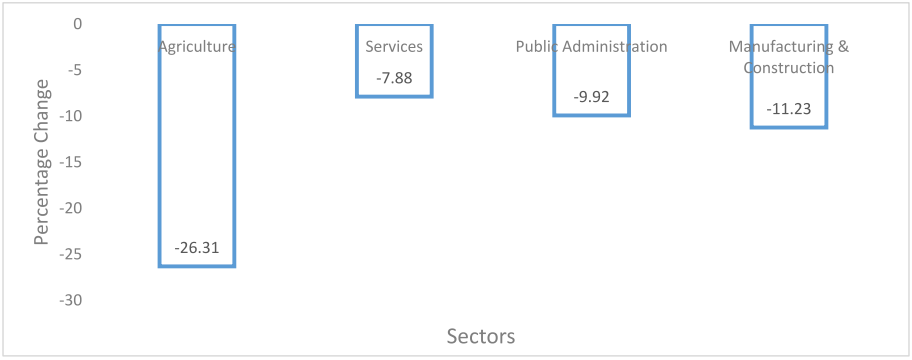


**Fig. 1.** Effect of Tariff Removal on Price of Local Products in Sectors Excluding Taxes on the Products.


**Fig. 2.** Effect of Tariff Removal on Intermediate Consumption Price Index of Sectors.

Overall, quintile 1 spent the least as compared to the others with 86,000 CFA Francs spent in total and only 2.9 % allocated to savings. The rural households also show least allocation to savings (8.6 %) and per capita spending (243,000 CFA Francs) as compared to the urban households.

### 3.2. Simulation results

Following previous scholars like Decaluwé et al. (2013) and Nesongano (2023), a provisional market access assumption was imposed in attempt to study and simulate the effects of trade liberalization on the Malawian economy. As such, we assume that 75 percent of the commodities (mostly agricultural commodities) will be liberalized, creating a 75 % tariff removal shock in the model. Nonetheless, it should be acknowledged that the simulation results might exaggerate the effects of tax removal a bit (Decaluwé et al., 2013) as the PEP-1–1 does not completely isolate African trade data from the rest of the world. However, this might not be a problem as more than 90 percent of Malawian trade occurs in Africa (IFPRI, 2023). To that extent, the simulation effects are assessed on changes in prices and wages; consumption demand, output and business incomes; and government revenue.

#### 3.2.1. Impact of trade liberalization on prices and wages

First, the study assessed the impacts of trade liberalization on prices of local products, the consumption price index, and the different sectors wage rate of composite labor. To start with the prices of local products, the study first considered the actual prices excluding any taxes like Value Added Taxes with an aim of assessing the actual production value. Fig. 1 shows that the prices of local products in the agricultural, services, public administration and manufacturing and construction sectors will on average decrease by 26.31, 7.88, 9.92 and 11.23 percent respectively due to the liberalization. This was however expected as due to the linkages of the economies, local prices are expected to drop for the local products to be able to compete with the imported products (Nesongano, 2023). Since imported commodities will become cheap, local commodities will have to lower in prices to compete with the imported commodities.

With regards to intermediate consumption, which are raw materials for the final outputs in the respective sectors; as depicted in Fig. 2, the significant decrease in the intermediate consumption price index of the agriculture sector suggests a −20.51 % notable reduction in the cost of inputs for agricultural production which implicates the cost of inputs hence leading to increased profitability for farmers, potentially stimulating investment and production in the agricultural sector. Furthermore, reduced prices of agricultural inputs may also translate into lower production costs for food and agricultural products, contributing to lower consumer prices and improved affordability.

As regards to the service sector, manufacturing and public administration, the sectors saw a −13.29 %, −10.27 % and −4.02 % respectively suggesting that the sectors experience a considerable decline in the intermediate consumption price index, indicating reduced costs of inputs for service provision, which has an impact on input costs for service providers, and may lead to reduced prices for services, manufacturing and public administration such as transportation, communication, and utilities, benefiting consumers. Reduced production costs could stimulate investment and innovation within the services sector, potentially leading to improved service quality and efficiency. This may have varied wage outcomes depending on specific subsectors and demand conditions. While some may benefit from increased consumer spending resulting from lower service prices, others may face pressure on wages due to potential cost-cutting measures by employers.

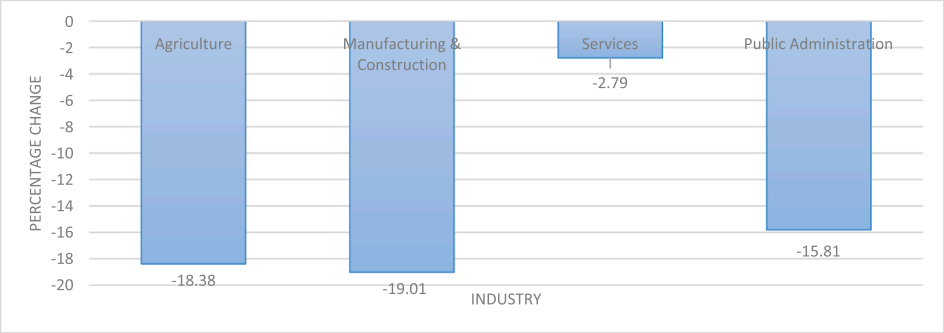


**Fig. 3.** Effect of Tariff Removal on Wage Rate of Industries Composite Labor.

**Table 7**
Tariff Removal Effect on Aggregate Output of Industries.

| Industry | Before AfCFTA (Billion MK) | After AfCFTA (Billion MK) | Percentage Change |
|---|---|---|---|
| Agriculture | 25,711 | 23513.28 | −8.55 |
| Manufacturing & Construction | 17,539 | 18476.42 | 5.34 |
| Services | 21,335 | 22261.02 | 4.34 |
| Public Administration | 8255 | 9163 | 11.00 |

**Table 8**
Effect of Tariff Removal on World Demand for Exports of Products in Sectors.

| Industry | Before AfCFTA (Billion MK) | After AfCFTA (Billion MK) | Percentage Change |
|---|---|---|---|
| Agriculture | 7417 | 8869.23 | 19.58 |
| Services | 2653 | 2928.56 | 10.39 |
| Food | 241 | 278.41 | 15.52 |
| Manufacturing & Construction | 1180 | 1363.24 | 15.53 |

**Table 9**
Effect of Tariff Removal on Quantity of Product Imported in Sectors.

| Industry | Before AfCFTA (Billion MK) | After AfCFTA (Billion MK) | Percentage Change |
|---|---|---|---|
| Agriculture | 2613 | 17272.44 | 561 |
| Services | 1691 | 1490 | −11.88 |
| Manufacturing & Construction | 9970 | 9950.26 | −0.2 |

Fig. 3 on the other hand illustrates the expected effects on the wage rate of industrial composite labor. As expected, in order for domestic industries to compete with the imported product's prices, they will be forced to match the imported product prices, further forcing them to reduce their wages in order to produce at least where the reduced price is equal to marginal cost of production (Case, Fair, & Oster, 2019). The simulation results show that wage rate of industries composite labor will drop by 18.38, 19.01, 2.79 and 15.81 percent in the agriculture, manufacturing, services and public sectors respectively.

All in all, the simulation shows that consumers may benefit from lower prices in the agricultural products, potentially improving food affordability and enhancing consumer welfare. However, this may result in a downward impact on wages for Agricultural workers due to increased import competition and potentially lower revenues for domestic producers. Furthermore, the service sector experiences a moderate reduction in prices of local services post-tariff removal which result in lowering the prices of the service sector which benefits the consumers by reduced cost of services such as transportation, communication, and utilities. However, depending on the specific subsectors within the service industry, wage impacts may vary. While some service workers may face wage stagnation or decline due to increased competition, others may benefit from increased consumer spending and demand for services.

### *3.2.2. Impact of trade liberalization on consumption Demand, output and business incomes*

Next, the study sought to simulate the effects of trade liberalization on consumption demand, output and business incomes. It should be noted that the removal of tariffs makes commodities cheaper (IFPRI, 2023), thus increasing the demand for consumption goods. Such demand is further expected to stimulate production (supply) which in the end has implications on the incomes that businesses make in the country. First, the simulation results show an 8.55 percent decline in aggregate output of local production in the agricultural sector. This further echoes the majority of trade in Malawi which is focused on agricultural commodities. Thus, with the opening up of the economy, more agricultural products at a cheaper price will be flowing into the country, forcing the aggregate output in the sector to drop, with the market prices dropping as well (Case, Fair, & Oster, 2019). Nonetheless, the trade liberalization will end up boosting aggregate output in manufacturing and construction (5.34 %), Services (4.34 %) and public administration (11 %) (Table 7).

Again, Table 8 presents the effects of tariff removal on world demand

**Table 10**
Tariff Removal Effect on Consumption of Commodities by Households.

| Commodity | Household | Before AfCFTA (Billion MK) | After AfCFTA (Billion MK) | Percentage Change |
|---|---|---|---|---|
| agriculture | Poor Rural | 5970.28 | 8096.14 | 35.61 |
| agriculture | Poor Urban | 4235.15 | 5553.14 | 31.12 |
| agriculture | Rich Rural | 2299.38 | 2855.44 | 24.18 |
| agriculture | Rich Urban | 1653.17 | 2141.23 | 29.52 |
| Services | Poor Rural | 2543.35 | 2628.37 | 3.34 |
| Services | Poor Urban | 3392.74 | 3424.64 | 0.94 |
| Services | Rich Rural | 1563.65 | 1467.78 | −6.13 |
| Services | Rich Urban | 2341.62 | 2374.35 | 1.40 |
| Food | Poor Rural | 2294.85 | 2442.75 | 6.44 |
| Food | Poor Urban | 2795.24 | 2897.93 | 3.67 |
| Food | Rich Rural | 870.65 | 836.43 | −3.93 |
| Food | Rich Urban | 2199.54 | 2287.19 | 3.98 |
| Other Industry and Manufacturing | Poor Rural | 815.62 | 793.43 | −2.72 |
| Other Industry and Manufacturing | Poor Urban | 1197.98 | 1141.69 | −4.70 |
| Other Industry and Manufacturing | Rich Rural | 750.52 | 662.76 | −11.69 |
| Other Industry and Manufacturing | Rich Urban | 2276.99 | 2188.99 | −3.86 |

**Table 11**
Effect of Tariff Removal on Intermediate Consumption of Industries.

| Industry | Before AfCFTA (Billion MK) | After AfCFTA (Billion MK) | Percentage Change |
|---|---|---|---|
| Agriculture | 6018.41 | 5503.97 | −8.55 |
| Manufacturing & Construction | 7098.03 | 7477.41 | 5.34 |
| Services | 6721.77 | 7013.52 | 4.34 |
| Public Administration | 3672.42 | 4076.79 | 11.01 |

**Table 12**
Effect of Tariff Removal on Domestic Demand for Commodities Produced Locally.

| Industry | Before AfCFTA (Billion MK) | After AfCFTA (Billion MK) | Percentage Change |
|---|---|---|---|
| Agriculture | 18,234 | 14140.95 | –22.45 |
| Manufacturing & Construction | 18,762 | 19463.44 | 3.74 |
| Services | 8255 | 9163.94 | 11.01 |
| Public Administration | 16,098 | 16933.63 | 5.19 |

for exports of products in the different sectors. As rightly hypothesized, trade liberation will make commodities cheap and hence increase the volume of exports as the demand of commodities will increase on the global market. As earlier pointed out, Malawi being an agrarian economy, the agricultural sector will benefit more with an increased export demand of 19.85 percent. Other sectors include manufacturing and construction (15.53 %), food and beverages (15.52 %) and services (10.39 %). This shows increased opportunities for the Malawian sectors to boost production and meet the demand gap that exist on the international market.

Table 9 on the other hand shows the effect of a tariff removal on quantity of the products imported in the different sectors. As postulated in the theory of demand, low prices imply increased demand (Case, Fair, & Oster, 2019). Malawi being that country that mostly trades in agricultural commodities, it expected that imports of agricultural products and food will increase by 561 percent due to the reduced prices. Much as this can be deemed as good effect of cheaper prices from trade liberalization, the Malawian economy is still expected to maintain a negative balance of trade in the long run as the demand of exports in the agricultural sector will only increase by 19.58 percent, with the combined effect of the rest of the sectors not exceeding 50 percent (Table 8). However, Table 9 further shows that the imports of services and manufacturing and construction sectors will decrease by 11.88 and 0.2 percent respectively. This is mainly due to the fact that the reduced import prices might not be as low as domestic prices, hence not experiencing an increased volume of imports (Nesongano, 2023).

Table 10 provides an assessment of the effect of the tariff removal on consumption of commodities from the different sectors by the different household types in order to assess which household types will be affected more. Again, the SAM considers four household types which are the poor rural, poor urban, rich rural and rich urban households. The simulations show increased consumption of commodities in the agricultural sectors by all household types. However, rich rural households report a drop in consumption of commodities in the services sector by 6.13 percent and food by 3.93 percent. This can be attributed to the fact that the households allocate more of the incomes to the other sectors that have experienced significant price drops, and which maximizes their overall welfare (Case, Fair, & Oster, 2019). Interestingly, all households report drops in the consumption of other industry and manufacturing commodities. This further shows the substitution of households by consuming more of those products that are cheaper and more relevant in their household budgets, aiming at improving overall household welfare.

Table 11 provides the effects of tariff removal on the intermediate consumption of industries raw materials in the different sectors. Much as we have seen that intermediate consumption prices will decrease; the simulation results further show that the raw material consumption of agriculture will slightly decline by 8.55 percent. This is so as final consumption becomes cheaper, demand for imports of final products will increase further making it a little expensive to produce final products locally. Nonetheless, intermediate consumption of manufacturing and construction, services and public administration will all increase agreeing with the law of demand.

**Table 13**
Effect of Tariff Removal on Local Businesses Incomes.

| Incomes by Firms | Before AfCFTA (Billion MK) | After AfCFTA (Billion MK) | Percentage Change |
|---|---|---|---|
| Disposable Income | 3949 | 3579.43 | −9.36 |
| Capital Income | 5229 | 4742.31 | −9.31 |

**Table 14**
Effect of Tariff Removal on Government Revenue from Import Duties.

| Industry | Before AfCFTA (Billion MK) | After AfCFTA (Billion MK) | Percentage Change |
|---|---|---|---|
| Agriculture | 826.27 | 500 | −65.25 |
| Food | 200 | 165.77 | −17.12 |
| Manufacturing & Construction | 1800 | 1796.43 | −0.2 |

Table 12 further provides the simulation results on domestic demand for commodities produced locally in the different sectors. The results further agree with those in 11 as the final products demand for agriculture drops by 22.45 resulting from the drop in the industry's consumption of raw materials. Again, the final product demand for locally produced commodities in the manufacturing and construction (3.74 %), services (11.01 %) and public administration (5.19 %) will all increase as a result in the increase of intermediate consumption of such industries.

Table 13 on the other hand provides an overall assessment of the effect of tariff removal on the incomes of local business in the aforementioned sectors. Due to global competition, it is expected that most businesses will experience a drop in disposable incomes (9.36 %) and capital income (9.31 %). This is mainly due to the fact that the competition will force local prices to go down which will further have a bearing on their profits. Again, much as the prices will drop, the consumers will be faced with multiple sources of products to consume from, which will further drop the quantities initially sold by local businesses. This call for more preparation through product diversification in order to remain competitive.

### *3.3.3. Impact of trade liberalization on government revenue*

Lastly, the study conducts an assessment on the effect of trade liberalization on government revenue. This is so as governments mostly rely on taxes for their revenues which they use to run the administrative duties of countries. The removal of trade tariffs will see a decrease in revenue collected from the agricultural sector by 65.25 percent; food and beverages (17.12 %); and manufacturing and industry (0.2 %). The agricultural sector experiences a huge decrease as it remains the biggest sector in the Malawian economy with lots of imports Table 14.

Again, the taxes on products and imports will drop by 0.46 percent forcing the government to look for other revenue sources through taxes on other production (increase of 26.95 %). This shows that the removal of trade tariffs might have an adverse effect on government revenues, hence the need for strategies in ensuring that the government still has resources to carry out its administrative duties (Fig. 4).

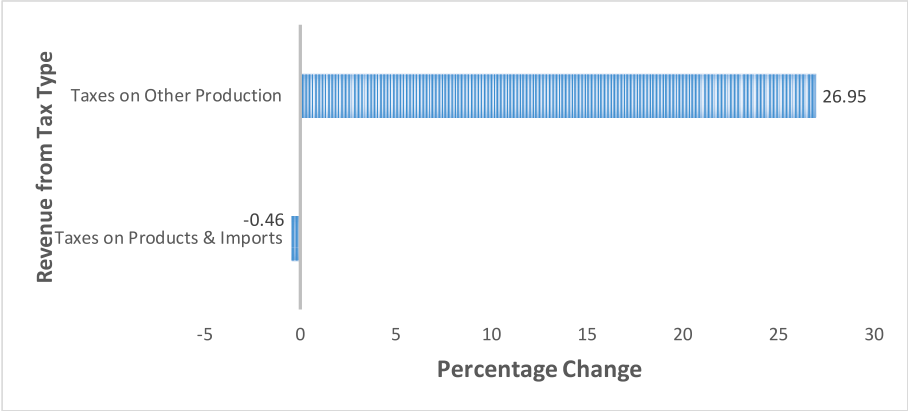


**Fig. 4.** Effect of Tariff Removal on Government Revenue from Different Taxes.

## 4. Conclusions and recommendations

The paper studied the impacts of trade liberalization on the economy of Malawi, with a focus on the African Continental Free Trade Area (AfCFTA). To properly unpack the impacts, the paper employed a PEP-1–1 CGE model in GAMS using the recent 2019 Social Accounting Matrix (SAM) as the base year; further making simulations of tariff removal to assess the impacts on the economy. The study notes that the removal of trade tariffs results in the fall of commodity prices and the prices of intermediate consumption in all sectors. First, on prices and wages, the simulation results found significant decline in prices of agricultural products, thus improving affordability of food by households and hence helping the country attain food security.

Much as prices are expected to drop, the simulation nevertheless shows adverse impacts on wages of agricultural workers of which are in majority in Malawi. This might further result in low incomes amongst the majority of the population. Again, local products aggregate output is expected to decline as prices of imported products will force local prices to drop as well in order for local products to compete with imported products.

Furthermore, the study notes that the removal of tariffs will increase exports of products in the agricultural sector. Nonetheless, the foreign earnings from the exports will not be much to offset the required imports as the imports of agricultural products will increase by more than 30-fold, further causing threats to the balance of payments. Lastly, the study notes that government revenue from import tariffs will decrease due to the removal of taxes, further forcing the government to think of other sources of tax revenue in order to maintain enough revenue to execute its administrative duties.

The study recommends that the government should focus on export-oriented sectors like the manufacturing and construction industries to offset the loss in revenue from the removal of import tariffs. Specifically, strategies and policies aimed at manufacturing and assembling machinery and automobiles would help to offset the imports in those sectors. Furthermore, the country should consider to implement strategies that ensure that it moves away from exporting primary products, to exporting final processed products especially in the agricultural sector in order to experience more gains from trade. This will help the government to export more to compensate for the revenue loss. Again, there is a need for diversifying local production, especially that in the agricultural sector in order to render local production competitive and further improve wage rates and remain competitive in a global village. The income from improved wages can later on improve taxable income from indirect taxes by the government.

Moving forward, it is imperative for the country to understand that implementing strategies that embrace trade liberalization remain essential for sustainable development. Enough evidence exists of the benefits of trade liberalization. Nonetheless, the case of Malawi is a bit different as the country is more of a net importer, putting it at risk of a bigger negative balance of trade if it does not embrace structural reforms in its sectors through building the capacity of its labour from more unskilled workers to skilled workers who can be employed in the advanced sectors of manufacturing and processing for more exports and foreign exchange gains.

## CRediT authorship contribution statement

**Wisdom Richard Mgomezulu:** Writing – review & editing, Writing – original draft, Visualization, Resources, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Paul Thangata:** Conceptualization, Data curation, Project administration, Resources, Supervision, Validation, Writing – review & editing. **Daniel Njiwa:** Conceptualization, Investigation, Methodology, Validation, Writing – review & editing.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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