

Improving the coverage of African countries in GTAP Data Base to better support Africa's development

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Over the past five years, the Global Trade Assistance and Protection (GTAP) Data Base has been expanded to include 16 additional individual African countries, while datasets for 10 existing African countries have been updated. Most of these efforts were supported by the United Nations Economic Commission for Africa (ECA), in collaboration with experts from African National Statistical Offices and the Center for Global Trade Analysis (CGTA), alongside contributions from other partner institutions. As a result, the number of African countries represented individually in the GTAP Data Base has reached 42, enabling researchers and policymakers to conduct more detailed and policy-relevant analysis on priority issues facing African economies. This article documents the progress achieved so far and outlines next steps to address remaining data gaps for African countries in the GTAP Data Base. It also highlights key experiences, lessons learned, and challenges encountered during the process. By linking the work of statisticians and economists, the paper provides valuable insights for researchers, practitioners, and policymakers who rely on the GTAP Data Base for empirical analysis but may be less familiar with the underlying data construction process. Strengthening country-level coverage in the GTAP Data Base is essential to support evidence-based policymaking and unlock Africa's development potential.

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1. Introduction

Africa hosts nearly twenty percent of the world's population, possesses about two-thirds of the world's uncultivated arable land, and around one-third of the world's mineral reserves. On top of such strategic assets, Africa's youthful and fast-growing population, combined with its rich culture and traditions, offers a promising avenue for the continent's economic transformation and development.

For such opportunities to materialize, African countries will need to design and implement policy reforms that capitalize on the immense and still largely untapped resources. These policies should also address the most pressing challenges, including infrastructure deficits, economic and environmental vulnerabilities, as well as security and governance issues.

This is where data plays a critical role. While data alone is not the silver bullet to tackle Africa's most urgent development challenges and unleash its enormous potential, it can provide an indisputable basis for advancing evidence-based reforms. The GTAP Data Base, first developed back in 1993, has proven particularly instrumental in that respect.

The GTAP Data Base relies on country-based input-output tables (IOTs), which contain inter-sectoral linkages within each country (Aguiar et al., 2025). Ultimately, combining national and regional IOTs, the GTAP Data Base is used as a so-called global Social Accounting Matrix (SAM) to feed into computable general equilibrium (CGE) models, thereby providing a detailed picture of all economic transactions that occur across the world economy in a specific year. This, in turn, enables quantitative analysis of complex policy reforms.¹

Concrete examples that evidence the use of the GTAP Data Base combined with CGE models to advance Africa's trade agenda can be found in an article from an earlier volume of this same Journal—the *Journal of Global Economic Analysis*. Indeed, the article titled: "Back to the Future: A 25-year Retrospective on GTAP and Shaping of a New Agenda" highlights the role of the United Nations Economic Commission for Africa (ECA), alongside other organizations, in assisting African member States with the design and implementation of evidence-

¹ Computable general equilibrium (CGE) models are complex computer-based numerical tools, based on economic theory, mathematical equations and real-world data. They are used to analyze the economic effects because of a policy change that leads to a new general equilibrium. The general equilibrium concept is attributed to Léon Walras (*Elements of Pure Economics*, 1874) and considers equilibriums where supply and demand must be equal in all economic markets for production factors, goods and services simultaneously. In other words, CGE models help assess economic impacts associated with policies expected to affect multiple interdependent markets simultaneously.

based reforms to advance Africa's development.² For instance, GTAP-related data and tools have been instrumental in assisting African Union member States in the negotiation, adoption, and ongoing implementation of the Agreement Establishing the African Continental Free Trade Area (AfCFTA).

However, such analyses are only possible if individual African countries are included as separate entities in the GTAP Data Base. But data availability and reliability have posed serious challenges, which are particularly acute in the African context. The first version of the GTAP Data Base, released in 1993, covered 37 sectors and only 15 countries or regions, with no single African country included individually. It took 22 years to reach a total of 26 African countries individually disaggregated in Version 9 of the GTAP Data Base released in 2015 (see Table A.1 of the Appendix), with the remaining 28 African countries aggregated into six heterogeneous groupings.³ This continental disaggregation took place along with an increase in sectoral scope to 65, covering key agricultural, energy and mining, industrial, and services sectors that are all very relevant to Africa's future development.

Against this backdrop, towards the end of 2020 and mindful of the growing need for African countries to have critical data available to better design and implement evidence-based reforms, the ECA decided to effectively contribute towards closing the gaps for Africa in the GTAP Data Base. The reforms targeted by ECA analyses included the United Nations 2030 Agenda for Sustainable Development, the African Union's Agenda 2063, and especially the implementation of the AfCFTA Agreement, poised to start on January 1st, 2021. As a result of ECA's work, complemented by contributions from several partner organizations, 42 African countries are now included individually in Version 12 of the GTAP Data Base, alongside updated data for several other African countries. This new database has been publicly released in February 2026. Version 12 provides comprehensive data on the consumption of intermediate as well as final goods and services, bilateral trade flows for both merchandise and services, the use of factors of production (i.e., labor disaggregated by skill-level, capital, natural resources, and land), transport, taxes and subsidies, bilateral protection on goods, land use, international migration, greenhouse gas emissions (CO₂ and non-CO₂), and renewable energy use, etc., for the years 2023, 2019, 2017, 2014, 2011, 2007, and 2004.

² van Tongeren, F., R. Koopman, S. Karingi, J.M. Reilly, and J. Francois. (2017). "Back to the Future: A 25-year Retrospective on GTAP and the Shaping of a New Agenda." *Journal of Global Economic Analysis*, 2(2): 1-42.

³ While Western Sahara (Sahrawi Arab Democratic Republic) is a member of the African Union (AU), bringing the total number of AU member States to 55, the United Nations (UN) does not recognize Western Sahara as an independent state but as a non-self-governing territory leading to 54 African countries recognized by the UN.

Despite this progress, 12 African countries remain to be incorporated individually into the GTAP Data Base. Further efforts must continue to achieve full coverage of the African continent as quickly as possible to facilitate effective evidence-based policymaking and implementation in support of Africa's inclusive and sustainable development objectives.

The rest of this article examines in greater detail the evolution of the coverage of African countries in the GTAP Data Base since late 2020, and the remaining gaps. It also describes the process followed, the challenges encountered, solutions adopted to improve Africa's representation in the database, as well as limitations of the current database. These insights may be particularly relevant for researchers and institutions interested in contributing to further closing the data gaps in the GTAP Data Base, not only for Africa, but also for other regions. Such work is essential to enhance national, regional, and global policy analysis, decision-making, and implementation in an increasingly complex and rapidly changing geopolitical landscape.

2. Evolution of Africa's coverage in the GTAP Data Base since late 2020

While Version 1 of the GTAP Data Base (released in 1993) did not include any specific reference to Africa, which was simply included in 'Rest of World', Version 2 (released in 1994) and Version 3 (released in 1996) both had two Africa-related groupings: Sub-Saharan Africa, Middle East and North Africa. Morocco was the first individual African country appearing in Version 4 of the GTAP Data Base (released in 1998). From Version 5 (released in 2001) to Version 9 (released in 2015), 25 African countries were progressively added in the GTAP Data Base, bringing the total individual countries covered to 26. However, no new African country was incorporated in Version 10 (released in 2019). Table A.1 of the Appendix illustrates the evolution of the coverage of individual African countries in all GTAP Data Bases released to date.

Therefore, by the end of 2020, fewer than half of the African countries were represented individually in the then-latest publicly available version of the GTAP Data Base (Version 10). These included: Benin, Botswana, Burkina Faso, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Ghana, Guinea, Kenya, Madagascar, Malawi, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Togo, Tunisia, Uganda, Zambia, and Zimbabwe (see countries highlighted in blue in Figure 1, left panel).

The remaining 28 African countries (highlighted in grey color in Figure 1, left panel) were aggregated into six heterogeneous regional groupings, namely "Rest of North Africa" (composed of Algeria, and Libya),⁴ "Rest of Western Africa"

⁴ Western Sahara is also part of this group in the GTAP Data Base. However, it is not listed here since the United Nations (UN) does not recognize Western Sahara as an independent state but as a non-self-governing territory.

(Cabo Verde, the Gambia, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Sierra Leone)⁵, “Rest of Central Africa” (Central African Republic, Chad, Congo, Equatorial Guinea, Gabon, Sao Tome and Principe), “South Central Africa” (Angola and the Democratic Republic of the Congo), “Rest of Eastern Africa” (Burundi, Comoros, Djibouti, Eritrea, the Seychelles, Somalia, Sudan)⁶, and “Rest of South African Customs Union” (Eswatini and Lesotho). The domestic economies in these regions were approximated by pairing individual countries from the 26 known countries with similarly structured unknown countries and scaling economic activity based on macroeconomic data from the unknown economies.

It is worth noting that the 28 African countries, not covered individually in Version 10 of the GTAP Data Base, accounted for a significant share of the continent’s economic and resource base in the 2014 reference year. Collectively, these countries in 2014 represented 25% of Africa’s GDP (including Algeria as the fourth and Angola as the fifth biggest African economies), 27% of Africa’s total population (including Democratic Republic of the Congo as the fourth most populous African country) and 35% of Africa’s total arable land (including Sudan and Niger as the second and third largest arable land areas among African countries, respectively).⁷ Additionally, more than 60% of African least developed countries (LDCs) and half of landlocked countries on the continent were not covered individually. This limited coverage significantly constrained the scope for granular analysis of key development priorities across the continent.⁸

In December 2020, working closely with relevant national statistical offices (NSOs) across Africa and in collaboration with the Center for Global Trade Analysis at Purdue University, ECA, through its African Trade Policy Centre (ATPC) within the Regional Integration and Trade Division (RITD), started collecting and compiling relevant information to update existing IOTs for African countries already represented in the GTAP Data Base, and to develop new IOTs for African countries not previously included individually in the database (Mevel, 2025).⁹ The IOTs were subsequently processed and incorporated into the GTAP Data Base by the Center for Global Trade Analysis, following the procedures described in section 3 of this article.

⁵ With Saint Helena, not considered part of Africa, included as well.

⁶ Mayotte, an overseas department of France, is also included in this regional grouping.

⁷ Authors’ calculations based on the World Development Indicators ([World Development Indicators | DataBank](#)).

⁸ Based on UNCTAD lists of least-developed countries ([UN list of least developed countries | UN Trade and Development \(UNCTAD\)](#)); based on eligibility by 2014) and landlocked countries ([List of Landlocked Developing Countries | UN Trade and Development \(UNCTAD\)](#)).

⁹ Or in some cases supply and use tables (SUTs). But ultimately, SUTs were converted into IOTs to match GTAP requirements.

The prioritization of African countries to be covered was based on several criteria, considered individually or jointly: 1) Request from member States for the addition or update of a specific country in the GTAP Data Base, or addressing regional imbalances in country coverage in the GTAP Data Base when considering new countries to be added, or urgent needs to update existing tables for countries already covered; 2) Capacity of national experts to undertake the data collection and compilation work; 3) Data availability and readiness. Clearly the work on a specific identified priority country (criteria 1) could only begin if an expert was available to undertake the work (criteria 2), giving priority to experts from NSOs having direct access to official data, and that available data was recent enough and meeting the minimum requirements for subsequent insertion of compiled national IOTs into the GTAP Data Base (criteria 3).¹⁰

Considering the gaps shown in Figure 1, particularly in Central Africa where only Cameroon was covered at the time, a strong emphasis on countries from this specific sub-region were prioritized, while continuing in parallel to add countries from other African sub-regions. As for the update of IOTs from countries already covered, the existing tables with the oldest data years were also prioritized. In light of this and considering both the tasks required and the financial resources available, the overall effort was implemented in five successive phases to date, as outlined below.¹¹

2.1 Phase 1 (2021): Seven countries – Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon – covered through ECA-led efforts

An official request was received by ECA from the Government of Comoros to undertake an evaluation of the likely economic impacts of AfCFTA implementation on their country, which required CGE modelling work built upon the GTAP Data Base. As Comoros was not included as an individual country in the database at the time, being lumped into the “Rest of Eastern Africa” grouping, collection and compilation of dedicated national data for Comoros into an IOT became necessary. This work was accomplished in collaboration with the Comoros National Institute of Statistics and Demographic Studies (INSEED).

The budget available for ECA’s GTAP Data Base activities in 2021 also made it possible to focus on an additional six countries, beyond Comoros. Therefore, in an effort to improve the coverage of Central African countries in the GTAP Data Base and building on the availability of suitable national expertise and the required underlying data, five new IOTs were developed for the Central African Republic,

¹⁰ For further details on contributions to and requirements for the GTAP Data Base, see: [Contribute data to GTAP](#).

¹¹ Collecting and compiling the required information for each country took on average 6 months and costed around USD 20,000; noting that the work could be undertaken for several countries in parallel.

Chad, Congo, Equatorial Guinea and Gabon. These countries, previously grouped under “Rest of Central Africa”, were prioritized to improve regional granularity. In addition, the sixth IOT was produced for Côte d'Ivoire, with the data year revised to 2015 from the previous 1998 table.

The tables for those seven countries were subsequently added or updated (in the case of Côte d'Ivoire) in Version 11 of the GTAP Data Base, which was publicly released in April 2023.

2.2 Phase 2 (2022): Six countries covered through ECA-led efforts

IOTs for six countries, comprising three new additions (Eswatini, Mali and Niger) and three updates (Botswana, Cameroon and Zimbabwe), were completed in 2022 under Phase 2 of this effort.

Existing IOTs for Botswana, Cameroon, and Zimbabwe faced a risk of exclusion from the forthcoming Version 11 of the GTAP Data Base due to the relatively old base years for which they were initially compiled. Indeed, new tables for Botswana, Cameroon and Zimbabwe were compiled for the years 2016, 2017 and 2017, respectively, to replace the older ones from the years 1994, 2003 and 1991, respectively.

IOTs for all six countries were later successfully incorporated into Version 11 of the GTAP Data Base.

2.3 Phase 3 (2023): Another three countries covered through ECA-led efforts

In 2023, ECA led the development of IOTs for three more African countries.

Consistent with the spirit of further improving coverage of Central African countries, and at the same time expanding representation across other African sub-regions, a new IOT was built for the Democratic Republic of the Congo, which had previously been aggregated under the “South Central Africa” grouping. In addition, Mauritania was separated from the “Rest of Western Africa” grouping.

The work on the Democratic Republic of the Congo was undertaken as part of a broader awareness-raising and capacity-building exercise on data development and trade policy modelling, conducted jointly by ECA, the Government of the Democratic Republic of the Congo, and the National Institute of Statistics in Kinshasa.

A more recent IOT for Mauritius based on the year 2018 (vs. 1997 previously) was also produced to ensure that the country will continue to be represented as a single economy in the next version of the GTAP Data Base.

The IOT for the Democratic Republic of the Congo has been implemented in Version 11 of the GTAP Data base, while those for Mauritania and Mauritius were incorporated in Version 12 of the GTAP Data Base.

2.4 Phase 4 (2024): Another four countries covered through ECA-led efforts

Throughout 2024, ECA continued its efforts to close the gaps in African country coverage within the GTAP Data Base, with work undertaken in four countries.

The ECA efforts were advanced through the organization of capacity building events on data and trade policy modelling with the governments and relevant NSOs this time in Angola (initially lumped in the “South Central Africa” grouping) and Sao Tome and Principe (part of the “Rest of Central Africa” group), leading to the development of GTAP Data Base-compatible IOTs for the two countries. Importantly, this work completed individual country coverage for Central Africa in the Data Base, marking a notable milestone, as all economies from the sub-region are now represented individually with much of the data supplied by the national statistical offices in these countries.

Concomitantly, the relatively old existing IOT for Madagascar in the GTAP Data Base for the year 1999 was updated to the year 2019.

The IOTs for Angola, Sao Tome and Principe, and Madagascar have now been incorporated into Version 12 of the GTAP Data Base.

2.5 Phase 5 (2025 and still ongoing): Another two countries covered through ECA-led efforts

It is also worth noting that work on two additional IOTs was started in 2025, although not yet completed.

First, an IOT for Lesotho has just been finalized but not yet incorporated into the GTAP Data Base. Once done, this will complete the coverage of countries previously grouped under the “Rest of South African Customs Union”, following the earlier completion of the work on Eswatini. This effort follows a formal request received by ECA from the Government of Lesotho for more granular empirical analysis to better support the country in navigating the rapidly changing global landscape, including assessments of the potential economic impact of the increased import tariffs introduced by the United States Administration since April 2025 on Lesotho’s textile and apparel-dependent economy.

In parallel, work is ongoing to separate Seychelles from the “Rest of Eastern Africa” grouping, with the National Bureau of Statistics of Seychelles currently in the process of collecting the required data for future compilation of the IOT and its subsequent integration in the GTAP Data Base.

Both countries are foreseen to be incorporated into Version 13 of the GTAP Data Base.

2.6 Six countries covered, outside ECA-led efforts (2021-2025)

Over the same 2021-2025 period, further improvements in African coverage of the GTAP Data Base were achieved through initiatives undertaken outside ECA-led efforts.

Specifically, the IOT for Sudan, initially part of the “Rest of Eastern Africa” grouping in the GTAP Data Base, which had been compiled by the International Food Policy Research Institute (IFPRI) in 2016, was incorporated in Version 12 of the GTAP Data Base by the Center for Global Trade Analysis (CGTA).¹² In 2021, Algeria was separated from the “Rest of North Africa” grouping by the CGTA staff and also added in Version 12 of GTAP Data Base.

Moreover, updated IOTs for South Africa (from year 2005 to 2017), Mozambique (from year 2007 to 2015), and Morocco (from year 2004 to 2019), were developed through projects supported by the World Bank in 2021, 2022 and 2024, respectively. An IOT for Nigeria was updated in 2025 (from year 2006 to 2018) under a project jointly supported by the Consultative Group on International Agricultural Research (CGIAR) Research Program (CRP) on “Policies, Institutions and Markets” (PIM), the Bill & Melinda Gates Foundation (BMGF), and the United States Agency for International Development (USAID).¹³ The revised IOTs for Mozambique and South Africa were incorporated to Version 11 of the GTAP Data Base, while the updated IOT for Morocco and Nigeria were included in Version 12 (documented in Pereira (2026) and Aguiar (2026a), respectively).

2.7 Recap

As summarized in Table 1, over the past 6 years, IOTs for 26 African countries have been produced and subsequently incorporated in either Version 11 or Version 12 of GTAP Data Base. Of these 26 completed IOTs, 16 (14 supported by ECA) were new country additions (see countries highlighted in green in Figure 1, right panel), while 10 (6 supported by ECA) were updates of existing tables.

As noted under section 2.5, work on another two additional countries, Lesotho and the Seychelles, is still ongoing, with IOTs expected to be inserted in future releases of the GTAP Data Base.

¹² Work undertaken by Khalid Siddig, a Senior Research Fellow in the Development Strategies and Governance Unit (DSG) and the Program Leader of the Sudan Strategy Support Program (SSSP) at IFPRI.

¹³ Mozambique and South Africa were undertaken by Dirk van Seventer and Rob Davies, both independent consultants.

Table 1. List of input-output tables (IOTs) for individual African countries added or updated in Versions 11 and 12 of the GTAP Data Base.

Completion year	No. of table	Table type	Main GTAP version	Country	African region	Lead organization
2016	1	New	12	Sudan	Northern Africa	IFPRI
2021	8	New	11	Central African Republic	Central Africa	ECA
		New	11	Chad	Central Africa	ECA
		New	11	Comoros	Eastern Africa	ECA
		New	11	Congo	Central Africa	ECA
		Updated	11	Côte d'Ivoire	Western Africa	ECA
		New	11	Equatorial Guinea	Central Africa	ECA
		New	11	Gabon	Central Africa	ECA
		Updated	11	South Africa	Southern Africa	World Bank
2022	8	New	12	Algeria	Northern Africa	GTAP
		Updated	11	Botswana	Southern Africa	ECA
		Updated	11	Cameroon	Central Africa	ECA
		New	11	Eswatini	Southern Africa	ECA
		New	11	Mali	Western Africa	ECA
		Updated	11	Mozambique	Southern Africa	World Bank
		New	11	Niger	Western Africa	ECA
		Updated	11	Zimbabwe	Southern Africa	ECA

(Continued . . .)

Table 1. List of input-output tables (IOTs) for individual African countries added or updated in Versions 11 and 12 of the GTAP Data Base. (. . . Continued).

Completion year	No. of table	Table type	Main GTAP version	Country	African region	Lead organization
2023	3	New	11	Democratic Republic of the Congo	Central Africa	ECA
		New	12	Mauritania	Northern Africa	ECA
		Updated	12	Mauritius	Southern Africa	ECA
2024	5	New	12	Angola	Southern Africa	ECA
		New	12	Burundi	Eastern Africa	ECA
		Updated	12	Madagascar	Southern Africa	ECA
		Updated	12	Morocco	Northern Africa	World Bank
		New	12	São Tomé and Príncipe	Central Africa	ECA
2025	1	Updated	12	Nigeria	Western Africa	CGIAR, BMGF, USAID
Ongoing	2	New	n/a	Lesotho	Southern Africa	ECA
		New	n/a	Seychelles	Southern Africa	ECA

Notes: The full list of individual contributors to IOTs of African countries incorporated in Versions 11 and 12 of the GTAP Data Base is provided in Table A.2 of the Appendix. IFPRI stands for International Food Policy Research Institute. ECA stands for the United Nations Economic Commission for Africa. GTAP stands for Global Trade Analysis Project. CGIAR stands for Consultative Group on International Agricultural Research. BMGF stands for Bill & Melinda Gates Foundation. USAID stands for the United States Agency for International Development.

Source: Authors.

As a result of these intensive efforts, led by the ECA with support from the Center for Global Trade Analysis, the latest publicly available Version 12 of the GTAP Data Base includes 42 African countries represented individually (see countries highlighted in either green or blue in Figure 1, right panel), covering nearly 78% of the continent's economy, compared with just 48% six years ago (see countries highlighted in blue in Figure 1, left panel).

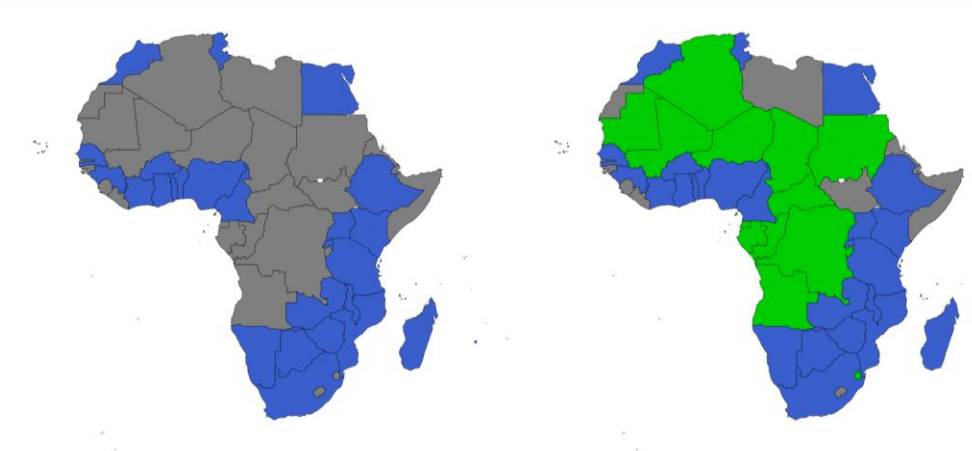


Figure 1: Comparison of the coverage of individual African countries between the GTAP Data Base version 10 (left panel) and the GTAP Data Base version 12 (right panel).¹⁴

Notes: Countries highlighted in blue (left and right panels) are those 26 African countries that were already available in Version 10 of the GTAP Data Base, while those highlighted in green (right panel) are the 18 countries which were added in Versions 11 and 12 of the GTAP Data Base. Countries in grey are those that are not available individually in either Version 10 (left panel) or Version 12 (right panel) of the GTAP Data Base. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. The final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined.

Source: Authors based on [GTAP Data Bases: 10.211 Regions](#) and [GTAP Data Bases: 12.211 Regions](#).

Despite this substantial progress, further efforts remain necessary. In addition to Lesotho and the Seychelles, for which the work is already underway, another 10 African countries (i.e., Cabo Verde, Djibouti, Eritrea, the Gambia, Guinea-Bissau, Liberia, Libya, Sierra Leone, Somalia, and South Sudan) still need to be added to the GTAP Data Base to enable fully granular policy analysis of trade policy impacts on every individual African country (see countries highlighted in grey in Figure 1, right panel).

In addition, a few African countries (e.g., Egypt, Ethiopia, and Kenya) risk being excluded from future releases of the GTAP Data Base, unless more recent IOTs are produced and updates implemented in the future version in a timely manner.

To illustrate the importance of incorporating this additional country detail in the GTAP Data Base, Box 1 reports the results from illustrative simulations using Version 10 and Version 12 of the database.

¹⁴ Although South Sudan wasn't specifically referenced in Version 10 of the GTAP Data Base.

Box 1. Illustrative simulation: The effects of recent US tariff announcements on individual African countries.

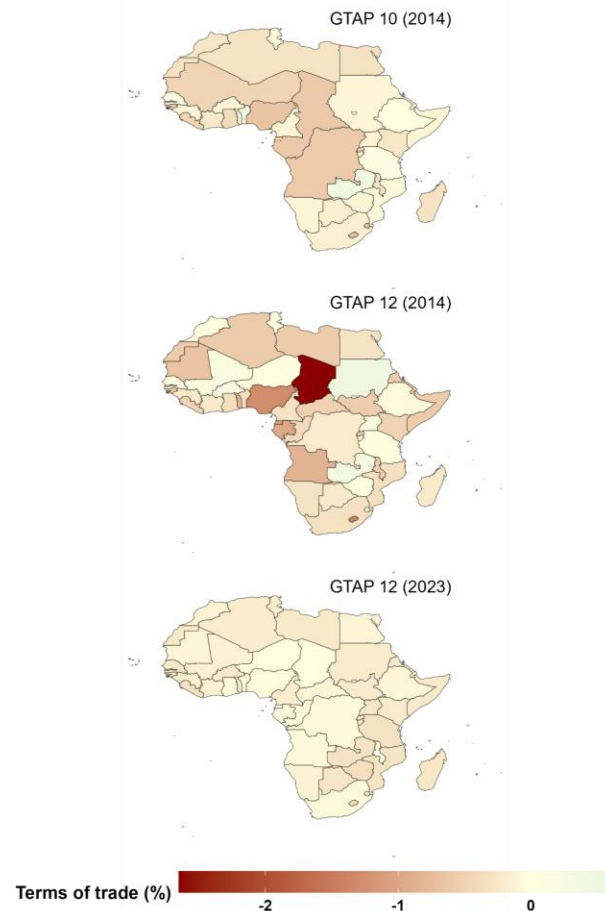
The policy simulation presented in this Box is purely illustrative. It assumes that the United States (US) targets a 15% import tariff across all sectors and all trading partners. Product-specific tariffs are not incorporated: this includes both exemptions (e.g., for energy, minerals, and certain electronic and fertilizer products), and higher tariff increases applied to selected products such as steel, aluminum, copper, automobile, car parts, wood, and paper. No countermeasures by other countries are considered.

To illustrate how modelling results are influenced by both database improvements and updates in underlying economic data, the same simulation is implemented using the standard GTAP computable general equilibrium (CGE) static model across two versions of the GTAP Data Base (Version 10 and Version 12) and two reference years (2014 and 2023). This approach disentangles differences arising from (i) changes in database structure, particularly the expanded country coverage for Africa in Version 12; and (ii) changes in the underlying data over time.

To ensure comparability, Version 12 is run using both its latest reference year (2023) and the 2014 benchmark, which corresponds to the latest year available in Version 10; Version 10 is therefore implemented only for the year 2014. For each case, results are presented at the highest level of country disaggregation available for Africa. This enables a consistent basis for assessing how database version, data vintage, and country detail influence the simulation outcomes.

The Figure below displays the resulting terms-of-trade effects following the US setting its tariff at 15%. The top panel, based on the Version 10 with 2014 data, shows Nigeria, a major oil exporter (crude petroleum not being exempted in this illustrative exercise), as the most affected country, followed by several regional groupings (i.e., “South Central Africa”, “Rest of Central Africa”, “Rest of Western Africa”, and “Rest of North Africa”). This reflects the more limited country coverage in Version 10, where many African economies are represented through regional grouping calibrated using proxy data (e.g. GDP).

By contrast, the middle panel, which uses the Version 12 with the same 2014 reference year, confirms a significant reduction of Nigeria's terms of trade, but Chad is standing out as the most affected country. Back in 2014, the US was the main export destination for Chad (with 75.4% of Chad's total exports going to the US; 99.5% of which were fuels) and the increase in US import tariffs causes the reduction of the terms-of-trade driven by the decrease in the price of exports. ¹



Terms-of-trade effects in African countries after US tariff of 15%

Notes: Results shown on the top are based on Version 10 country availability while those on the middle and bottom are derived from Version 12 country availability. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. The final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined.

Source: Authors based on Standard GTAP computable general equilibrium static model.

With Version 12 of the GTAP Data Base, impacts can now be pinpointed for more individual countries instead of relying extensively on regional estimates. Table A.4 in the Appendix provides the values plotted in the above figure. For instance, while Version 10 reports a considerable negative terms-of-trade impact for the “South Central Africa” grouping (comprising Angola and the Democratic Republic of the Congo), Version 12 reveals that the negative impact is mostly concentrated in Angola, with the Democratic Republic of the Congo experiencing a substantially smaller effect. More broadly, the Version 12 results based on 2014 data show more nuanced and heterogeneous impact across the African continent than those from Version 10 based on the same year, reflecting both improved country-level representation and updated underlying data in Version 12.

The bottom panel extends the comparison by using the 2023 data year in Version 12 of the GTAP Data Base. With the updated data, the terms-of-trade impacts for both Chad and Nigeria are considerably less affected by the increased US import tariff. This reflects substantial evolution in their trade relationships with the US over the past decade. In Chad’s case, the US has become far less significant as an export destination. Its share in Chad’s total merchandise exports has dropped sharply from 75.4% in 2014 to just 2.1% in 2023. On the import side, the US share also fell, albeit more modestly, from 2.5% to 1.4% over the same period. As a result, Chad’s exposure to US trade policy shocks has diminished considerably.

For Nigeria, the pattern is more mixed. While the share of the US in the country’s total merchandise exports has increased from 3.5% in 2014 to 8.7% in 2023, the importance of the US as a source of Nigeria’s imports declined significantly, from 11.0% to 5.3%. This rebalancing reduces Nigeria’s overall vulnerability to US tariff changes, particularly through the import channel.

Across the continent, the use of the 2023 benchmark data generally points to relatively more limited terms-of-trade effects compared to simulations based on the 2014 benchmark. This is largely because the US accounts for a smaller share of Africa’s total merchandise exports in 2023 (4.7%) than in 2014 (5.5%). Nevertheless, the US remains a key export market for several African economies, including Lesotho, Madagascar, Ethiopia, Mauritius, Kenya, South Africa, and Nigeria, highlighting the continued heterogeneity in exposure across the continent.

¹ The trade shares in this box are from the authors’ calculation based on UNCTADStat (<https://unctadstat.unctad.org/datacentre/>); accessed on 29 April 2026. Only trade in goods is considered, as the increased US import tariffs do not apply on trade in services.

3. From data collection and compilation to a new release of the GTAP Data Base: Data sources, requirements, and process

National IOTs, which describe inter-industry flows of goods and services, are the backbone of the GTAP Data Base. They provide the core structure for each sector inside country boundaries for all the national IOTs. GTAP brings to bear the complementary international data to produce a single global, comprehensive, and consistent economic framework.

The following subsections begin with a summary of GTAP adjustments that are common to all contributed IOTs. It then goes over the data sources and processing to adapt to the GTAP contribution format. The following section reviews the challenges faced in the context of contributions supported by ECA.

3.1 Incorporation of a GTAP-compatible IOT into the GTAP Data Base

During the GTAP Data Base development, a national IOT is combined with a set of complementary macroeconomic, trade, and protection data collected externally (Aguiar et al., 2025). This integration is required because the IOTs are used to determine the structure of the economy expressed in share terms, while the supplementary datasets provide the macroeconomic totals.

All IOTs, regardless of the reference year they represent, are adjusted to each GTAP reference year and converted into a common currency and unit (millions of US dollars) using market exchange rates and macroeconomic data drawn from the World Development Indicators as explained in Benavidez-Brouk et al. (2026). This is a necessary step because not all countries report their IOTs at the same time and they do not reflect the same reference year.

GTAP also targets agricultural and energy production data to improve the sectoral representation of IOTs from different years, leveraging the work of specialized international data agencies, including the United Nations Food and Agriculture Organization and the International Energy Agency.

Together, these inputs allow the GTAP Data Base to reflect country-specific economic conditions across each of its seven reference years (2023, 2019, 2017, 2014, 2011, 2007, 2004). For details, please refer to Aguilar et al. (2025).

3.2 Data sources and national IOT compilation process

National IOTs are typically derived from national supply and use tables (SUTs) and informed by national accounts data, which are collected and subsequently compiled by NSOs. This compilation process is often supported by specialized software packages, such as ERETES, to ensure compliance with international standards or so-called systems of national accounts (SNA) in specific years (e.g.,

SNA 1993, 2008, or 2025).¹⁵ Table 2 shows the reference year of the contributed table and their SNA if this has been reported.

Table 2. Reference year of the African countries contributed under their systems of national accounts (SNA) basis.

Country	SNA	Reference Year
Algeria	n/a	2015
Angola	2008	2015
Botswana	2008	2016
Burundi	2008	2016
Cameroon	2008	2017
Central African Republic	1993	2017
Chad	n/a	2016
Comoros	1993	2017
Congo	n/a	2016
Côte d'Ivoire	1968	2015
Democratic Republic of the Congo	n/a	2013
Equatorial Guinea	1993	2017
Eswatini	n/a	2017
Gabon	1993	2017
Madagascar	n/a	2019
Mali	2008	2017
Mauritania	n/a	2017
Mauritius	n/a	2018
Morocco	n/a	2004
Mozambique	n/a	2015
Niger	2008	2019
Nigeria	2008	2018
São Tomé and Príncipe	1993	2019
South Africa	2008	2017
Sudan	2008	2012
Zimbabwe	2008	2017

Notes: SNA stands for System of National Accounts and represents the internationally agreed standard set of recommendations for compiling measures of economic activity, such as Gross Domestic Product (GDP). Not all contributions disclose the SNA principles used and are therefore marked as not available (n/a).

Source: Authors.

¹⁵ ERETES stands for “*Equilibres ressources emplois, Tableaux entrées-sorties*” in French for “Input Output Tables, Supply and Use Tables” was developed over twenty years ago through a collaborative project between the European Union (Eurostat) and France (INSEE). See: [History - ERETES](#).

In other words, the SUTs can adhere to different SNA guidelines for describing how goods and services are supplied and used within a national economy. On the supply side, SUTs include a production matrix by industry and product, along with imports by product, and valuation components such as collected taxes on product, trade, and transport margins. On the use side, they comprise intermediate consumption by industry and products, final consumption, capital formation, exports by product, and relevant valuation components by type of use and by product. Details on gross value added by industry are also provided based on the factors of production (i.e., labor and capital) and other taxes, minus subsidies on production.

Deriving an IOT from a SUT involves converting a rectangular product-by-industry table (as the number of products and industries in the economy generally differs) into a square industry-by-industry or product-by-product table; the latter being preferred as an IOT for the GTAP Data Base. This process may involve several technical steps, including: converting intermediate consumption values from purchasers' or agents' prices to basic prices; splitting uses between domestic output and imports; deducting import duties from the value of the imported uses at basic price; balancing the use of trade margins and transport margins; separating valuation components between domestic and imported uses; and finally transforming the intermediate consumption matrix from product-by-industry format into a product-by-product matrix, typically under the "industry technology" assumption.^{16,17}

3.3 IOT transformation into the GTAP format and minimum requirements

Once an IOT has been compiled for a given reference year, it must meet a set of specific requirements before it can be contributed to GTAP. Detailed and standardized guidelines for this process are publicly available on the GTAP website in GTAP Technical Paper 1 by Huff et al. (2000).¹⁸ The discussion below emphasizes the key steps and minimum conditions involved.

First, Version 12 of the GTAP Data Base is composed of 65 sectors. By contrast, national IOTs based on national accounts tend to differ greatly across countries in the number of products or sectors, and therefore, rarely align directly with the sectoral specification of the GTAP Data Base. While a national IOT may contain either fewer or more products or sectors than the 65 GTAP sectors, certain sectoral

¹⁶ The basic price represents the value meaning the value of the good or service produced, before taxes or subsidies. The agent or purchaser's price includes in the value of the goods or services purchased the relevant taxes, transport and trade margins (wholesale and retail) until the delivery place and time.

¹⁷ The "industry technology" assumption supposes that each industry uses same technology/fixed proportion of inputs for all the outputs.

¹⁸ See: [Contribute data to GTAP](#).

splits are mandatory for a GTAP contribution. For instance, agriculture and food processing, as well as energy, must be kept separate from other sectors.¹⁹ In addition, the national IOT should generally have a minimum of 30 products or sectors. If this threshold is not met, further disaggregation of the existing products or sectors is required to meet the set prerequisites. This was the case for Algeria and São Tomé and Príncipe, whose total number of contributed sectors was 21 and 25, respectively. Figure 2 shows the total number of sectors, aggregated into agriculture, food and others, in the national IOTs of the 26 African countries (and group average of the 145 countries in Version 12 of the GTAP Data Base), which were incorporated in Version 11 and Version 12 of the GTAP Data Base.

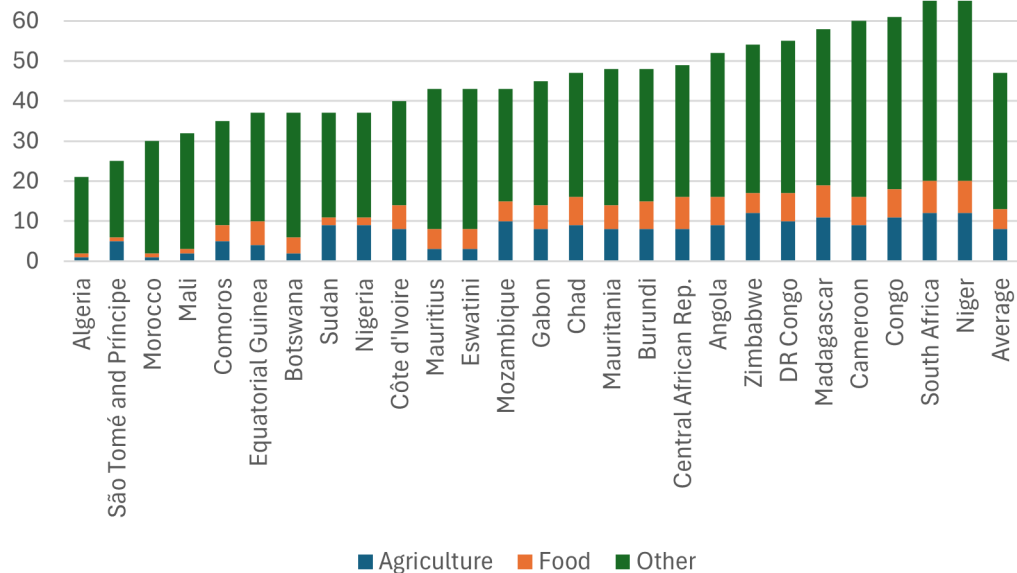


Figure 2: Comparison of the number of sectors, aggregated into agriculture, food and others, in the national IOTs across the 26 African countries (and group average of the 145 countries in Version 12 of the GTAP Data Base).

Notes: Countries can be contributed with up to 12 agricultural sectors and up to 8 processed foods as defined by the GTAP classification. By definition, the total number of GTAP sectors cannot exceed 65.

Source: Authors.

Once the minimum product or sector-specific requirements are fulfilled, a correspondence must be established between the products or sectors in the

¹⁹ See: <https://www.gtap.agecon.purdue.edu/databases/contribute/compsplit.asp> require the separation of agriculture and food processing, and energy, from other sectors.

national IOT and the 65 sectors in the GTAP Data Base. This concordance ensures that each of the products or sectors in the national IOT can be matched with at least one or more GTAP sectors. In practice, some products or sectors from the national IOT may simply be aggregated into a single GTAP sector, whereas other products or sectors will be split to match GTAP sectors.

Second, several additional minimum core requirements must be met. These include: the availability of a product-by-product table; the exclusion of re-exports; and a clear separation between domestically produced and imported goods.²⁰ Excluding re-exports is necessary because we want to be able to trace the effects of domestic exports on the local factor markets. Then, in the absence of an import-use matrix, we estimated it by proxying the total-use matrix and obtaining the domestic-use matrix as a residual.

Third, once all technical requirements are satisfied, GTAP requires a specific format for the national table, which must have two distinct matrices, as illustrated in Figure 3. The first matrix excludes product or commodity taxes to reflect the pre-commodity-tax usage values (UF) situation, while the second matrix includes commodity taxes to show the post-commodity-tax usage values (UP) situation. Two additional conditions are also critical: 1) the sign condition, which requires that all flows be non-negative, except changes in stocks (in both pre- and post-tax matrices); 2) the sectoral balance condition, which requires that total sales equal total costs for each sector.²¹ The reformatting causes no effect on the quality of the IOT but it facilitates its review process by letting us quickly identify negative or inconsistent entries when comparing pre- and post- tax valuations.

²⁰ For further details, see: [Structural adjustments](#).

²¹ Full details on the conversion of original IOT into GTAP IOT can be found here: [Format specification](#).

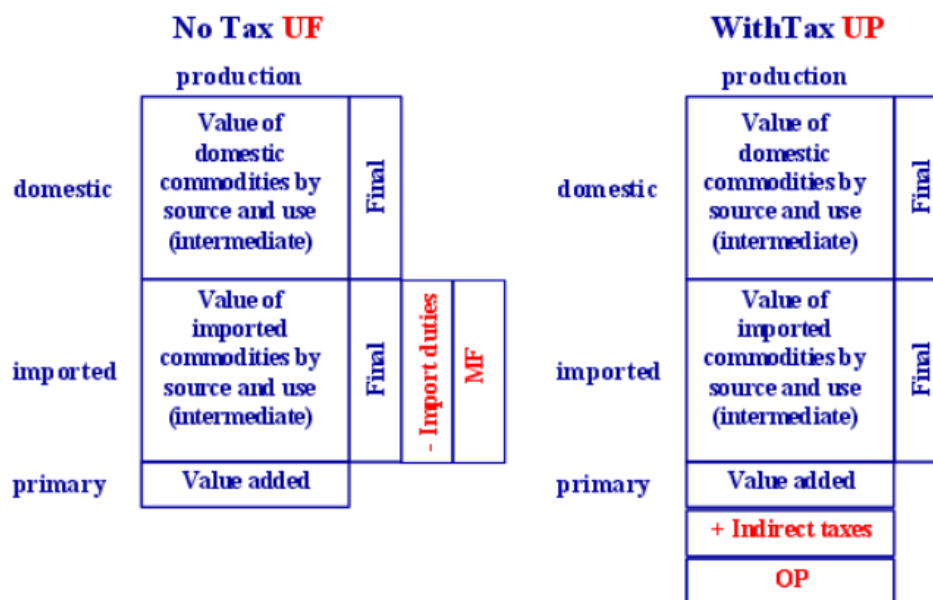


Figure 3: IOT in GTAP format.

Notes: UF is for “pre-commodity-tax usage values”, UP for “post-commodity-tax usage values”, MF for “imports of any commodity with import duties excluded”, and OP for “output of any sector with non-commodity indirect tax included”.

Source: GTAP (see: [Alternative view of IOT contribution format](#)).

4. Challenges encountered and implemented solutions: Recent experience from Africa

Compiling IOTs for African countries has largely been a trial-and-error process. Common challenges included insufficient sectoral disaggregation in national IOTs, a mismatch between products or sectors classification in national IOTs and GTAP Data Base, and difficulties in satisfying the sign and balance conditions after transforming national IOTs into GTAP format (e.g., Deffo, 2025; Dlamini, 2025; Niwemahoro, 2025). While those issues are certainly not unique to Africa, they have been particularly recurrent in the recent data compilation efforts undertaken on the continent, as discussed in section 2.

Among these challenges, establishing a correspondence between the products or sectors in the national IOTs and GTAP Data Base sectoral classification that meets the minimum technical requirements emphasized in the previous section has proven to be the most difficult for African countries during the compilation. This issue has frequently required substantial additional work in terms of sectoral splitting, data reallocation, and structural consistency checks.

As illustrated in Figure 2, the degree of difficulty varies significantly across countries. Table A.3 in the Appendix contains the mappings for all the contributed

African IOTs to the GTAP 65 sectors. The disaggregation procedure is described as a major step in the construction of the GTAP Data Base (Aguiar, 2026b). Two components are considered. The first component focuses on food and agricultural sectors using data from the FAO. This information is then used to determine the value of production and trade, at producer prices. For the second component, we rely on the representative table. This procedure does not replace the initial IO structure, which means that when aggregated to the original level of aggregation, one can recover the original data that was contributed.

For instance, in the case of Cameroon, where the task only required updating an existing but outdated table already included in the GTAP Data Base, the mapping exercise was rather straightforward. This was because most products and sectors in the national IOT already directly corresponded with the GTAP sectors. Figure 4 shows that eight of 12 GTAP agricultural sectors, paddy rice (“pdr” GTAP code), wheat (“wht”), cereal grains not elsewhere classified (“gro”), vegetables, fruit and nuts (“v_f”), oilseeds (“osd”), sugar cane and sugar beet (“c_b”), plant-based fibres (“pfb”), crops not elsewhere classified (“ocr”) had a direct correspondence in the original Cameroon IOT. However, the remaining four GTAP agricultural sectors – bovine cattle, sheep and goats, horses (“ctl”), animal products not elsewhere classified (“aop”), raw milk (“rmk”), wool, silk-worm cocoons (“wol”) – were all aggregated into a broader single “live animals” sector in the national IOT. This required GTAP to disaggregate the “live animals” sector into the four corresponding GTAP sectors.

The mapping exercise was more complex in the case of Mauritius, where the table also only required upgrading. Only two sectors: sugar cane (“c_b”) and textile (“wol”) could be matched directly with their GTAP counterparts. The “agricultural products” in the original IOT of Mauritius needed to be split into seven GTAP sectors (“pdr”, “wht”, “gro”, “v_f”, “osd”, “pfb”, and “ocr”), whereas “animal products” had to be divided into three GTAP sectors (i.e., “ctl”, “aop”, and “rmk”).

The most demanding case among the examples shown in Figure 4 was Eswatini, for which a new IOT was developed for inclusion in the GTAP Data Base. None of the agricultural sectors in the original IOT directly match individual GTAP sectors. The single, highly aggregated “agriculture” sector needed to be split into eight GTAP sectors (“pdr”, “wht”, “gro”, “v_f”, “osd”, “c_b”, “pfb”, and “ocr”), while the “live animals” sector from the IOT required being divided into the four appropriate GTAP sectors (i.e., “ctl”, “aop”, “rmk” and “wol”). These transformations necessitated extensive adjustments, and careful consistency checks to preserve accounting identities and meet GTAP Data Base’s technical requirements.

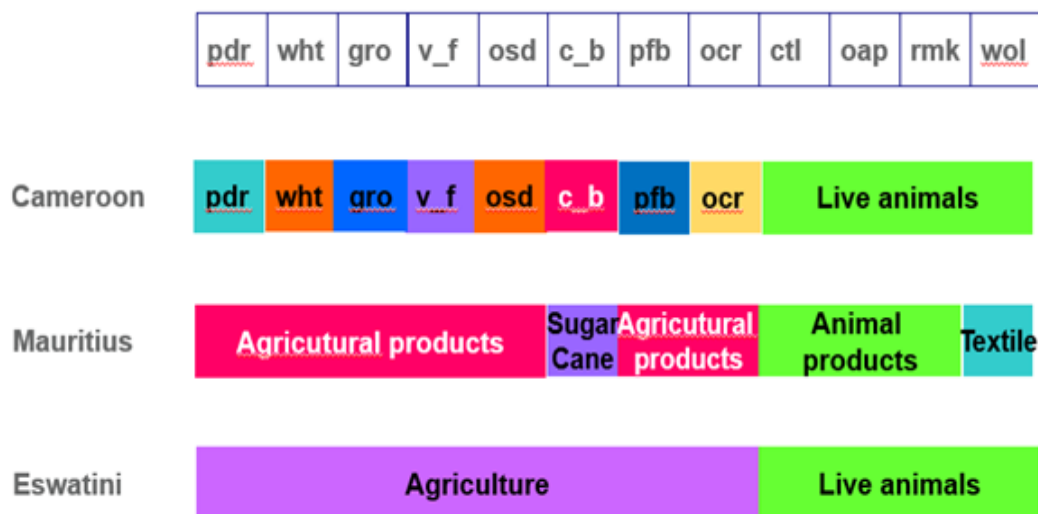


Figure 4: Illustration of sectoral differences in agriculture between selected African IOTs and GTAP Data Base.

Notes: Top level displays GTAP sector codes for agricultural sectors. Complete list of GTAP sector codes is available from GTAP 65 sectors. A complete list of the concordances used by the contributed African IOTs is available in Table A.3 of the Appendix.

Source: Aguiar (2025).

Another notable challenge arose when the GTAP sector had no direct match in the national IOT. A frequent example encountered in several of the African countries supported by ECA's efforts concerns the GTAP "dwellings" service sector ("dwe"), which is often not reported as a distinct activity in the national IOTs. Addressing this issue typically requires identifying a relatively similar sector, most commonly the real estate sector, and splitting it between dwellings and other real estate activities.

At a later stage in the transformation process, imbalances in the results tables and inconsistencies in tax mapping were also commonly observed when preparing African IOTs for insertion into the GTAP Data Base. These issues could be explained and fixed through targeted measures.

For example, if negative signs or flows that are not imputable to changes in stocks are found in the IOT, it could reflect a situation where, considering the current domestic demands, production may not be enough to allow for exports. One explanation for this discrepancy could be the presence of re-exports, which are not permitted in the GTAP Data Base.²² In practice, reducing the level of imports and exports to eliminate negative entries usually resolves such

²² See: [GTAP Data Bases: About Re-Exports](#).

problems.²³ Fortunately, when the national database is inserted into the GTAP Data Base, national IOTs are supplemented with balanced bilateral trade flows drawn from international data.

Negative values can also be a common issue, due to unexpected negative uses. Many times, these highlight a change in sign between UF (pre-commodity-tax usage values) and UP (post-commodity-tax usage values), particularly within the changes in stocks use. These cases typically indicate problems in the calibration of commodity taxes. Recalibrating to ensure that the changes in stocks remain unaffected to taxes proved effective in resolving such inconsistencies.

The above-mentioned examples document key challenges encountered, and the solutions implemented, during the ECA-led work to improve African country coverage in the GTAP Data Base over the years. These issues are inherent to the transformation of national IOTs into the GTAP format and are therefore not unique to Africa.

5. Main data limitations and shortcomings of the contributions to GTAP

While the coverage of reference years and individual countries in the GTAP Data Base have been significantly expanded, and the computational tools and techniques to compile the Data Base have also improved over time, the resulting database is not free of limitations. Like any large-scale global database, several caveats of the GTAP Data Base must be considered, including: the absence of the informal economy, potential distortions driven by uniform sources for national IOTs, the risk of outdated economic structures persisting in the database due to lack of regular GDP rebasing, limitations of applicability for non-CGE-based policy analysis, and the still incomplete individual country coverage across the African continent.

5.1 Absence of consideration of the informal economy

The GTAP Data Base does not include information on the informal economy, which represents a key limitation for policy analysis, although by no means unique to GTAP. According to the International Labour Organization (ILO), the informal employment rate stood at an average 57.9% of the total employment across the world in 2025. The issue is particularly pronounced in Africa, where the highest rate reached 84.4% that same year.²⁴

This gap extends to informal cross-border trade (ICBT), which is largely absent from official statistics despite its substantial economic importance, especially in Africa. Available estimates indicate that ICBT may account for between 7% and

²³ If exports were to exceed the sum of imports and domestic production would prompt us to also consider adjusting domestic production and the rates of absorption while ensuring the balance condition after any adjustment.

²⁴ See: [Informal employment rate - ILOSTAT](#).

16% of formal intra-African trade and between 30% and 72% of formal trade between neighboring African countries (ECA, 2021).

The absence of consideration of the informal economy in the GTAP Data Base limits its ability to fully reflect economic activity in the African context. Encouragingly, a continental methodology to measure ICBT in Africa has recently been adopted by the African Union, and is currently being rolled out by the African Union Commission/STATAFRIC, Afreximbank and ECA in several countries.²⁵ Over time, such information could help to improve data availability and enhance the representation of informal economic activity in the future.

5.2 Potential distortion driven by uniform sources of national IOTs and limited GDP rebasing

As discussed in sections 3 and 4, differences in terms of the sectoral level of disaggregation, the base year and quality of the data source behind the national IOTs can vary greatly across countries in Africa.

In the case of ECA-supported work described under section 2, priority has been given to working with NSOs to compile IOTs based on official data. However, limitations may arise, for instance due to infrequent GDP rebasing, which can affect the accuracy of underlying economic structure as well as consumption and investment patterns. Outside ECA's efforts, many IOTs included in GTAP Data Base do not source directly from NSOs, which may further limit overall consistency.

Ultimately, all IOTs, whether newly developed or updated, must undergo adjustments to ensure consistency within the GTAP Data Base (see sections 3 and 4). While necessary to maintain overall balance, these adjustments may introduce some level of distortion in the representation of national economies.

5.3 Risk of outdated economic structures

Another important limitation relates to the varying reference years of national IOTs. While Version 12 of the GTAP Data Base provides the national economic performances for the year 2023, these estimates are often underpinned by older economic structures. For instance, in Version 12, Madagascar's IOT is based on 2019 data, whereas it is 2012 for Sudan, and 2002 for Ethiopia. While the macro-economic totals are all updated to 2023, the composition of the economy and the sectoral cost structures are likely to evolve over time. Therefore, reliance on increasingly outdated IOTs can lead to misrepresentation of current economic realities, particularly for countries undergoing rapid structural transformation. Hence, it is critical to ensure that IOTs can be updated on a regular basis to avoid a situation where the country could be removed from the GTAP Data Base because

²⁵ See: [Continental guidelines for collecting Informal cross border trade statistics \(ICBT\) in Africa | Statafric](#).

the economic structure would no longer reflect reality. In Version 12, the most urgent updates are currently required for Kenya (2001 reference year), Ethiopia (2002), Benin (2003), Egypt (2003), and Namibia (2004).

5.4 Limitations for non-CGE-based analysis

The GTAP Data Base is primarily designed to support global CGE modeling. As such, only a single base year is sufficient for CGE model calibration. However, there is potential for time series analysis in the future. The latest Version 12 of the GTAP Data Base is provided for 7 different years: 2004, 2007, 2011, 2014, 2017, 2019, and 2023. This expands the potential of the GTAP Data Base relevance for econometric analysis, both cross-section analysis, and to some extent, panel data analysis.^{26,27} However, caution is required, especially for time series analysis.²⁸

The GTAP Data Base is not yet constructed at strictly regular intervals, reflecting both methodological choices and practical constraints. For instance, the years most affected by the COVID-19 pandemic were excluded from the GTAP time series to avoid calibrating models on atypical economic conditions, resulting in a four-year gap between 2019 and 2023. It is also challenging to update the GTAP Data Base on a yearly or bi-yearly basis considering the amount of work required.

As a result, the GTAP Data Base should be used with caution for policy analysis outside CGE modeling, as it was not originally designed for such purposes.

5.5 Incomplete individual country coverage

Despite recent efforts to expand coverage, as documented in this paper, the GTAP Data Base still does not provide full individual country representation. In Africa, even with 42 countries now available individually in Version 12, however, important gaps remain on the continent and other regions.

A dozen African countries remain to be covered individually in the GTAP Data Base (see Figure 1), although work has started in two countries, Lesotho and the Seychelles. As mentioned in section 2, there are different reasons for these omissions, ranging from lack of required data, limited financial resources, and capacity issues in some of the NSOs.

Beyond Africa, similar coverage gaps are observed in other regions, particularly in Oceania and the Caribbean. In Oceania, only Australia and New Zealand are available individually out of 14 independent sovereign states in the latest GTAP Data Base. In the case of the Caribbean, 5 out of the 13 independent sovereign states are covered as individual countries.

²⁶ Cross-section analysis considers one point in time.

²⁷ Panel data analysis considers multiple time periods.

²⁸ Time series analysis considers regular intervals (e.g. quarters, months, years).

Until full country coverage is achieved, and complemented by regular updates of the IOTs, country-level analysis will remain constrained, limiting the ability to conduct granular and fully representative country-level economic assessments.

6. Conclusion and way forward

Levels of economic development vary widely across countries, as does the availability of data required to undertake robust empirical analysis. High-quality data are essential to enable policy analysis that can subsequently help formulate and implement evidence-based reforms, with a view to ultimately supporting economic development.

More than three decades ago, the GTAP Data Base was created to help address these gaps. It has since become the cornerstone of data-driven policy analysis around the globe. Expanding the coverage of developing countries within the GTAP Data Base has been a gradual process, but this has still enabled policy makers to overcome constraints to effective evidence-based policymaking and implementation. This has been powerfully demonstrated in the last decade and a half, as improved and enhanced African countries representation in the GTAP Data Base enabled robust empirical work to be undertaken in support of the AfCFTA negotiations, among other significant economic development options (ECA-AU-AfDB 2012, ECA 2018, ECA 2025). Beyond informing policy options in the negotiations, the enhanced satellite components of the GTAP Data Base, including land-use data, energy related carbon emissions data, etc., enabled deeper research to support the AfCFTA implementation with climate change considerations in mind. In fact, the policy discourse on green industrialisation through the AfCFTA, has been informed to a large extent by the availability of high-quality data, that is inclusive of many African countries. Nonetheless, there are some significant data gaps that still persist, particularly for developing countries from the Caribbean, Oceania, and Africa regions.

This article has demonstrated how recent efforts led to improved situation in the African region. Largely led by the United Nations Economic Commission for Africa, long-standing gaps in the GTAP Data Base have now been closed. Between 1993 and 2019, a total of 26 African countries were incorporated as single economies in the GTAP Data Base, corresponding to an average of one African country added per year over a 26-year period. By contrast, mostly through ECA support, 16 additional African countries have been incorporated into the GTAP Data Base in just five years since, between 2021 and 2025—equivalent to an average of 3.2 countries per year.

As a result, the latest GTAP Data Base (Version 12) now includes 42 African countries represented individually. In addition, work is ongoing for an additional 2 countries, which are expected to be introduced in the next release, potentially bringing the total to 44 African countries covered in the next release of the GTAP

Data Base. On top of that, over the past five years, data for ten African countries that had become outdated were updated.

Taken together, these represent a substantial achievement. With approximately 78% - and soon more than 81% - of the African countries represented individually in the GTAP Data Base, it should also be mentioned that a dedicated GTAP Africa Data Base has been built and made available for Africa-specific policy analysis.²⁹ The scope for conducting fine-grained, country-level policy analysis to support Africa's development priority issues has therefore been remarkably strengthened.

Sustained efforts remain necessary to incorporate the remaining 10 African countries – Cabo Verde, Djibouti, Eritrea, the Gambia, Guinea-Bissau, Liberia, Libya, Sierra Leone, Somalia, South Sudan – into the GTAP Data Base, with the objective of ensuring that every African country is represented individually.³⁰ It is worth noting that eight out of these ten countries are classified as LDCs, which stand to greatly benefit from robust and evidence-based policy reforms to address their most pressing development challenges. In parallel, frequent updates will be required to maintain data relevance, starting with countries whose data are in urgent need of upgrade and revision (e.g., Benin, Egypt, Ethiopia, Kenya, and Namibia), and which otherwise risk being removed from future releases of the GTAP Data Base, therefore potentially diluting the latest progress achieved to date.

Finally, expanded and sustained capacity-building support for National Statistical Offices, both in Africa and outside Africa, will be critical. As an objective to generate contributions by African NSOs, ECA, working closely with national accountants, trade statisticians and balance of payment experts, is developing an African Input-Output Table (AfCIOT) which could be of use to continue filling data gaps and update African IOTs in GTAP Data Base.³¹ Strengthening the ability of NSOs to produce SUTs and IOTs on a more systematic and regular basis, ideally annually and with greater sectoral and product disaggregation, would not only facilitate the integration of national IOTs into the GTAP Data Base but also enhance robust policy analysis.

Beyond informing and supporting AfCFTA negotiations and its implementation over the past 15 years, using the GTAP Data base and GTAP-related modeling tools, ECA was able to help advance the conversation and

²⁹ Thanks to the Center for Global Trade Analysis, with assistance from the Bank Netherlands Partnership Program (BNPP), the World Bank and the European Commission. See: <https://www.gtap.agecon.purdue.edu/databases/Africa/default.asp>.

³⁰ Western Sahara is also not available as a single entity in the latest GTAP Data Base. However, it is not listed here because the UN does not recognize Western Sahara as an independent state but as a non-self-governing territory leading to 54 African countries recognized by the UN.

³¹ See ECA: [Unlocking Africa's Trade Potential with Cutting-Edge Data Tools | United Nations Economic Commission for Africa](#).

negotiations on many Africa's trade and regional integration priorities, including the African Growth and Opportunity Act with the US (Brookings and ECA, 2013), the Economic Partnerships Agreement with the EU (Mevel et al., 2015a), the importance to green Africa's trade (ECA and CEPIL, 2024), and the need to curb illicit financial flows going out of Africa (Mevel et al., 2015b). Moving forward, whereas ECA remains firmly committed to continuing to pursue its efforts to close data gaps for Africa in the GTAP Data Base, broader engagement will be essential. All stakeholders interested in advancing data-driven policy analysis and implementation to spur the development of African countries, and beyond, are encouraged to contribute. It is a collective effort for the benefit of all. Ultimately, such improvement would support countries in better leveraging evidence-based policymaking to unleash their development potential.

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Appendix

Table A.1. Evolution of the coverage of individual African countries in GTAP Data Bases.

Version	Data year	Release year	No. of African countries available separately	No. of African countries added from the previous	List of African countries added from the previous	African region the country belongs to
1	1990	1993	0	0	n/a	n/a
2	1992	1994	0	0	n/a	n/a
3	1992	1996	0	0	n/a	n/a
4	1995	1998	1	1	Morocco	Northern Africa
5	1997	2001	8	7	Tanzania Uganda Botswana Malawi Mozambique Zambia Zimbabwe	Eastern Africa Southern Africa
6	2001	2005	11	3	Tunisia Madagascar South Africa	Northern Africa Southern Africa
7	2004	2008	16	5	Egypt Nigeria Senegal Ethiopia Mauritius	Northern Africa Western Africa Eastern Africa Southern Africa

(Continued . . .)

Table A.1. Evolution of the coverage of individual African countries in GTAP Data Bases.
(. . . Continued)

Version	Data year	Release year	No. of African countries available separately	No. of African countries added from the previous	List of African countries added from the previous	African region the country belongs to
8	2004, 2007	2012	21	5	Cameroon	Central Africa
					Côte d'Ivoire	Western Africa
					Ghana	Western Africa
					Kenya	Eastern Africa
9	2004, 2007, 2011	2015	26	5	Namibia	Southern Africa
					Benin	Western Africa
					Burkina Faso	Western Africa
					Guinea	Western Africa
10	2004, 2007, 2011, 2014	2019	26	0	Togo	Western Africa
					Rwanda	Eastern Africa
11	2004, 2007, 2011, 2014, 2017	2023	38	12	n/a	n/a
					Algeria	Northern Africa
					Sudan	Northern Africa
					Central African Republic	Central Africa
					Chad	Central Africa
					Congo	Central Africa
					Democratic Republic of the Congo	Central Africa
					Equatorial Guinea	Central Africa
					Gabon	Central Africa
					Mali	Western Africa
					Niger	Western Africa
Comoros	Eastern Africa					
Eswatini	Southern Africa					

(Continued . . .)

Table A.1. Evolution of the coverage of individual African countries in GTAP Data Bases.
(... Continued)

Version	Data year	Release year	No. of African countries available separately	No. of African countries added from the previous	List of African countries added from the previous	African region the country belongs to
12	2004, 2007, 2011, 2014, 2017, 2019, 2023	2026	42	4	Mauritania	Northern Africa
					São Tomé and Príncipe	Central Africa
					Burundi	Eastern Africa
					Angola	Southern Africa

Source: Authors.

Table A.2. Individual contributors of African input-output tables (IOTs) incorporated in Versions 11 and 12 of the GTAP Data Base.

Completion year	Table type	Country	Lead organization	Individual contributor
2016	New	Sudan	IFPRI	Khalid Siddig
2021	New	Central African R.	ECA	Roger Yélé
	New	Chad	ECA	Youssef Ibn Ali
	New	Comoros	ECA	Mohamed Said Ali
	New	Congo	ECA	Alain Patrick Makouala
	Updated	Côte d'Ivoire	ECA	Souleymane Sadio Diallo
	New	Equatorial Guinea	ECA	Severo Ngua Bibang Obono
	New	Gabon	ECA	Paul Mapessi
	Updated	South Africa	World Bank	Dirk van Seventer & Rob Davies
2022	New	Algeria	GTAP Centre	Angel Aguiar
	Updated	Botswana	ECA	Lekoko Simako
	Updated	Cameroon	ECA	Jean Pierre Assako Essiben & Achille Carlos Deffo
	New	Eswatini	ECA	Nsika Melusi Dlamini
	New	Mali	ECA	Kadidia Traoré
	Updated	Mozambique	World Bank	Angel Aguiar
	New	Niger	ECA	Laouali Chaibou
	Updated	Zimbabwe	ECA	Rob Davies & Dirk van Seventer
2023	New	D. R. of the Congo	ECA	Gloire Kadima
	New	Mauritania	ECA	Abdoulaye Tandia
	Updated	Mauritius	ECA	Celine Niwemahoro, Francois Niragire & Jean Baptiste
2024	New	Angola	ECA	Henrique Nsingui
	New	Burundi	ECA	Lydia Bukuru
	Updated	Madagascar	ECA	Samuel Randriambolamanitra
	Updated	Morocco	World Bank	Maria Seara e Pereira
	New	São Tomé and Príncipe	ECA	Ana Justina Filipe Da Costa Almeida
2025	Updated	Nigeria	CGIAR, BMGF, USAID	Angel Aguiar & Maria Seara e Pereira
Ongoing	New	Lesotho	ECA	Celine Niwemahoro
	New	Seychelles	ECA	Kevin Bistoquet

Notes: IFPRI stands for International Food Policy Research Institute. ECA stands for the United Nations Economic Commission for Africa. GTAP stands for Global Trade Analysis Project. CGIAR stands for Consultative Group on International Agricultural Research. BMGF stands for Bill & Melinda Gates Foundation. USAID stands for the United States Agency for International Development.

Source: Authors.

Table A.3. Concordance between contributed African input-output tables (IOTs) and GTAP Sectors.

GTAP sectors	Sudan	Central African Republic	Chad
pdr	PDR	pdr	pdr
wht	WHT	wht_gro	wht
gro	GRO	wht_gro	gro
v_f	V_F	v_f	v_f
osd	OSD	osd	osd
c_b	C_B_SGR	c_b_pfb	c_b
pfb	PFB	c_b_pfb	pfb
ocr	OCR	ocr	ocr
ctl	CTL_CMT_OAP_	ctl_rmk	ctloapoth
oap	CTL_CMT_OAP_	oap	ctloapoth
rmk	RMK	ctl_rmk	ctloapoth
wol	CTL_CMT_OAP_	cmt_wol	ctloapoth
frs	FRS	frs	frs
fsH	FSH	fsH	fsH
coa	COA	oxt	coa
oil	OIL_GAS	oxt	oil
gas	OIL_GAS	oxt	p_c_gas
oxt	OMN	oxt	oxt
cmt	CTL_CMT_OAP_	cmt_wol	cmt_omt
omt	CTL_CMT_OAP_	omt	cmt_omt
vol	OFD_B_T_VOL_	vol	vol
mil	OFD_B_T_VOL_	mil	mil
pcr	OFD_B_T_VOL_	pcr	pcr
sgr	C_B_SGR	sgr	sgr
ofd	OFD_B_T_VOL_	ofd	ofd
b_t	OFD_B_T_VOL_	b_t	b_t
tex	TEX_WAP_LEA	tex	tex
wap	TEX_WAP_LEA	wap	wap
lea	TEX_WAP_LEA	lea	lea
lum	LUM	lum	lum
ppp	PPP	ppp	ppp
p_c	P_C_CRP_GDT	lum	p_c_gas
chm	P_C_CRP_GDT	chm_rpp	chmbphrpp
bph	P_C_CRP_GDT	bph	chmbphrpp

(Continued . . .)

Table A.3. Concordance between contributed African input-output tables (IOTs) and GTAP Sectors. (. . . Continued)

GTAP sectors	Sudan	Central African Republic	Chad
rpp	P_C_CRP_GDT	chm_rpp	chmbphrpp
nmm	NMM	nmm	nmm
i_s	I_S	i_s_fmp	Mnfcs
nfm	NMM_NFM_MVH_	i_s_fmp	Mnfcs
fmp	FMP	i_s_fmp	Mnfcs
ele	NMM_NFM_MVH_	otn	Mnfcs
eeq	NMM_NFM_MVH_	otn	Mnfcs
ome	NMM_NFM_MVH_	otn	Mnfcs
mvh	NMM_NFM_MVH_	otn	Mnfcs
otn	NMM_NFM_MVH_	otn	Mnfcs
omf	NMM_NFM_MVH_	omf	Mnfcs
ely	ELY	ely	ely_gdt
gdt	P_C_CRP_GDT	ely	ely_gdt
wtr	WTR	wtr	wtr
cns	CNS	cns	cns
trd	TRD	trd	trd
afs	TRD	afs	afs
otp	OTP	otp	otpatpwhs
wtp	WTP	wtp	wtp
atp	ATP	atp	otpatpwhs
whs	OTP	whs	otpatpwhs
cmn	CMN	cmn	cmn
ofi	OBS_OFI	ofi	ofi
ins	ISR	ins	ins
rsa	OBS_OFI	rsa	rsa
obs	OBS_OFI	obs	obs
ros	ROS	ros	ros
osg	OSG	osg	osg
edu	OSG	edu	edu
hht	OSG	hht	hht
dwe	DWE	dwe	dwe

(Continued . . .)

Table A.3. Concordance between contributed African input-output tables (IOTs) and GTAP Sectors. (. . . Continued)

GTAP sectors	Comoros	Congo	Côte d'Ivoire	Equatorial Guinea
pdr	pdr	PDR	pdr	sec1
wht	WhtGro	WHT	wht	sec1
gro	WhtGro	GRO	gro	sec1
v_f	VfOcr	V_F	v_f	sec2
osd	VfOcr	OSD	osd	sec2
c_b	OsdCbPfb	C_B	c_bpbc	sec2
pfb	OsdCbPfb	PFB	c_bpbc	sec3
ocr	OsdCbPfb	OCR	c_bpbc	sec3
ctl	CtOaRmWo	CTL	ctloap	sec4
oap	CtOaRmWo	OAPWOL	ctloap	sec4
rmk	CtOaRmWo	RMK	rmkmil	sec4
wol	CtOaRmWo	OAPWOL	woltexwa	sec4
frs	frs	FRS	frs	sec11
fsh	fsh	FSH	fsh	sec12
coa	CoOiGaOx	COA	coaopt	sec13
oil	CoOiGaOx	OILGAS	oilgas	sec13
gas	CoOiGaOx	OILGAS	oilgas	sec7
opt	CoOiGaOx	OXT	coaopt	omn
cmt	CmtOmt	CMTOMT	omtcmt	sec5
omt	CmtOmt	CMTOMT	omtcmt	sec5
vol	VoMiSgOf	VOL	vol	sec5
mil	VoMiSgOf	MIL	rmkmil	sec5
pcr	VoMiSgOf	PCR	pcrsgr	sec5
sgr	VoMiSgOf	SGR	pcrsgr	sec5
ofd	pcr	OFD	ofd	sec6
b_t	b_t	B_T	b_t	sec6
tex	Tex	TEX	woltexwa	tex
wap	Wap	WAP	woltexwa	sec14
lea	lea	LEA	lea	lea
lum	lum	LUM	lum	sec15
ppp	ppp	PPP	ppp	sec16
p_c	p_c	P_C	p_c	sec8
chm	ChmBphRp	CHM	chmbph	chm
bph	ChmBphRp	BPH	chmbph	sec16

(Continued . . .)

Table A.3. Concordance between contributed African input-output tables (IOTs) and GTAP Sectors. (. . . Continued)

GTAP sectors	Comoros	Congo	Côte d'Ivoire	Equatorial Guinea
rpp	ChmBphRp	RPP	rpp	sec16
nmm	nmm	NMM	nmm	sec17
i_s	MetlManu	I_SNFM	isfmfmp	sec18
nfm	MetlManu	I_SNFM	isfmfmp	sec18
fmp	MetlManu	FMP	isfmfmp	sec18
ele	MetlManu	ELE	eleqomtn	sec18
eeq	MetlManu	EEQ	eleqomtn	sec18
ome	MetlManu	OME	eleqomtn	sec18
mvh	MetlManu	MVH	eleqomtn	sec18
otn	MetlManu	OTN	eleqomtn	sec18
omf	MetlManu	OMF	omf	sec15
ely	ely	ELY	elygdwtr	sec9
gdt	gdt	GDT	elygdwtr	sec10
wtr	wtr	WTR	elygdwtr	sec19
cns	cns	CNS	cns	sec20
trd	trd	TRD	trd	sec21
afs	afs	AFS	afsros	sec22
otp	OtWtAtWh	OTP	otpwtp	sec21
wtp	OtWtAtWh	WTP	otpwtp	sec23
atp	OtWtAtWh	ATP	otpwtp	sec24
whs	OtWtAtWh	WHS	whsobs	sec25
cmn	cnm	CMN	cmn	sec26
ofi	OfiIns	OFI	ofinsrsa	sec27
ins	OfiIns	INS	ofinsrsa	sec28
rsa	RsaDweOb	RSA	ofinsrsa	sec29
obs	RsaDweOb	OBS	whsobs	sec30
ros	RsaDweOb	ROS	afsros	sec31
osg	ros	OSG	osg	sec31
edu	osg	EDU	edu	sec32
hht	edu	HHT	hht	sec33
dwe	hht	DWE	dwe	sec31

(Continued . . .)

Table A.3. Concordance between contributed African input-output tables (IOTs) and GTAP Sectors. (. . . Continued)

GTAP sectors	Gabon	South Africa	Algeria	Botswana	Cameroon
pdr	pdr	pdr	Agric	GTAP1_8	pdr
wht	WhtGro	wht	Agric	GTAP1_8	wht
gro	WhtGro	gro	Agric	GTAP1_8	gro
v_f	v_f	v_f	Agric	GTAP1_8	v_f
osd	osd	osd	Agric	GTAP1_8	osd
c_b	C_B	c_b	Agric	GTAP1_8	c_b
pfb	C_B	pfb	Agric	GTAP1_8	pfb
ocr	C_B	ocr	Agric	GTAP1_8	ocr
ctl	CtlOap	ctl	Agric	GTAP9_12	anp
oap	CtlOap	oap	Agric	GTAP9_12	anp
rmk	RmkMil	rmk	Agric	GTAP9_12	anp
wol	wol	wol	Agric	GTAP9_12	anp
frs	frs	frs	FRS	GTAP13	frs
fsh	fsh	fsh	FSH	GTAP14	fsh
coa	col	coa	OIL	GTAP15_32	coa
oil	OilGas	oil	OIL	GTAP15_32	oil
gas	OilGas	gas	OIL	GTAP15_32	gas
oxt	oxt	oxt	Mines	GTAP18	oxt
cmt	CmtOmt	cmt	Food	GTAP19_20	mtp
omt	CmtOmt	omt	Food	GTAP19_20	mtp
vol	vol	vol	Food	GTAP21_25	vol
mil	RmkMil	mil	Food	GTAP22	mil
pcr	PcrOfd	pcr	Food	GTAP21_25	pcr
sgr	sgr	sgr	Food	GTAP21_25	sgr
ofd	PcrOfd	ofd	Food	GTAP21_25	ofd
b_t	b_t	b_t	Food	GTAP26	b_t
tex	Tex	tex	TEX	tex	tex
wap	Wap	wap	WAP	wap	wap
lea	lea	lea	LEA	lea	lea
lum	LumOmf	lum	LUM_PPP	GTAP30_31	lum
PPP	ppp	ppp	LUM_PPP	GTAP30_31	ppp
p_c	P_c_Gdt	p_c	WTR_EGY	GTAP15_32	p_c
chm	ChmBph	chm	CRP	GTAP33_35	chm
bph	ChmBph	bph	CRP	GTAP33_35	bph

(Continued . . .)

Table A.3. Concordance between contributed African input-output tables (IOTs) and GTAP Sectors. (. . . Continued)

GTAP sectors	Gabon	South Africa	Algeria	Botswana	Cameroon
rpp	rpp	rpp	CRP	GTAP33_35	rpp
nmm	nmm	nmm	CNSM	GTAP36	nmm
i_s	I_S	i_s	ISMMEE	GTAP37_39	i_s
nfm	I_S	nfm	ISMMEE	GTAP37_39	nfm
fmp	I_S	fmp	ISMMEE	GTAP37_39	fmp
ele	ELE	ele	OMF	GTAP40_44	ele
eeq	ELE	eeq	OMF	GTAP40_44	eeq
ome	ELE	ome	OMF	GTAP40_44	ome
mvh	MvhOtn	mvh	OMF	GTAP40_44	mvh
otn	MvhOtn	otn	OMF	GTAP40_44	otn
omf	LumOmf	omf	OMF	GTAP45	omf
ely	ely	ely	WTR_EGY	GTAP46_47	ely
gdt	P_c_Gdt	gdt	WTR_EGY	GTAP46_47	gdt
wtr	wtr	wtr	WTR_EGY	GTAP48	wtr
cns	cns	cns	BTPH	GTAP49	cns
trd	trd	trd	TRD	GTAP50	trd
afs	afs	afs	AFS	GTAP51	afs
otp	OTP	otp	TRN_CMM	GTAP52_53	otp
wtp	OTP	wtp	TRN_CMM	GTAP52_53	wtp
atp	OTP	atp	TRN_CMM	GTAP54	atp
whs	whs	whs	TRN_CMM	GTAP55	whs
cmn	cmn	cmn	TRN_CMM	GTAP56	cmn
ofi	Ofi_Ins	ofi	OBS	GTAP57	ofi
ins	Ofi_Ins	ins	OBS	GTAP58	ins
rsa	RsaDwe	rsa	OBS	GTAP59	rsa
obs	obs	obs	OBS	GTAP60	obs
ros	ros	ros	OSH	GTAP61	ros
osg	osg	osg	OSH	GTAP62	osg
edu	edu	edu	OSH	GTAP63	edu
hht	hht	hht	OSH	GTAP64	hht
dwe	RsaDwe	dwe	OSH	GTAP65	dwe

(Continued . . .)

Table A.3. Concordance between contributed African input-output tables (IOTs) and GTAP Sectors. (. . . Continued)

GTAP sectors	Eswatini	Mali	Mozambique	Niger	Zimbabwe
pdr	agric	A01	pdr	pdr	pdr
wht	agric	A01	wht_gro	wht	wht
gro	agric	A01	wht_gro	gro	gro
v_f	agric	A01	v_f	v_f	v_f
osd	agric	A01	osd	osd	osd
c_b	agric	A01	c_b	c_b	c_b
pfb	agric	A01	pfb	pfb	pfb
ocr	agric	A01	ocr	ocr	ocr
ctl	live	A02	ctl	ctl	ctl
oap	live	A02	oap	oap	oap
rmk	dairy	A02	rmk_wol	rmk	ctl
wol	live	A02	rmk_wol	wol	oap
frs	frs	A03	frs	frs	frs
fsh	frs	A04	fsh	fsh	fsh
coa	coa_gas	B01	coa	coa	col
oil	coa_gas	B01	coa	oil	oxt
gas	coa_gas	B01	gas	gas	oxt
oxt	oxt	B01	oxt	oxt	oxt
cmt	meat	C01	cmt_omt	cmt	cmt
omt	meat	C01	cmt_omt	omt	cmt
vol	ofd	C01	volpcrsgr	vol	vol
mil	dairy	C01	mil_ofd	mil	mil
pcr	ofd	C01	volpcrsgr	pcr	ofd
sgr	sgr	C01	volpcrsgr	sgr	ofd
ofd	ofd	C01	mil_ofd	ofd	ofd
b_t	b_t	C01	b_t	b_t	b_t
tex	tex	tex	tex	tex	tex
wap	wap	wap	wap	wap	wap
lea	lea	lea	lea	lea	lea
lum	lum	C03	lum_ppp	lum	lum
ppp	ppp	C03	lum_ppp	ppp	ppp
p_c	p_c	C04	p_c	p_c	p_c
chm	chm_bph	C05	crp	chm	chm
bph	chm_bph	C05	crp	bph	bph

(Continued . . .)

Table A.3. Concordance between contributed African input-output tables (IOTs) and GTAP Sectors. (. . . Continued)

GTAP sectors	Eswatini	Mali	Mozambique	Niger	Zimbabwe
rpp	rpp	C06	crp	rpp	rpp
nmm	nmm	C07	nmm	nmm	nmm
i_s	metals	C08	i_snfmfmp	i_s	i_s
nfm	metals	C08	i_snfmfmp	nfm	nfm
fmp	fmp	C09	i_snfmfmp	fmp	fmp
ele	ele	C10	ele_ome	ele	ele
eeq	eeq	C10	ele_ome	eeq	eeq
ome	ome	C10	ele_ome	ome	ome
mvh	mvh_otn	C10	mvh_omf	mvh	otn
otn	mvh_otn	C10	mvh_omf	otn	otn
omf	omf	C111213	mvh_omf	omf	omf
ely	ely_gdt	D01	ely_gdt	ely	ely
gdt	ely_gdt	D01	ely_gdt	gdt	ely
wtr	wtr	E01	wtr	wtr	wtr
cns	cns	F01	cns	cns	cns
trd	trd	G01	trd	trd	trd
afs	afs	I01	afs	afs	afs
otp	transp	H01	otp_whs	otp	otp
wtp	transp	H01	otp_whs	wtp	otp
atp	atp	H01	otp_whs	atp	otp
whs	whs	H01	otp_whs	whs	whs
cmn	cmn	H02J01	cmn	cmn	cmn
ofi	ofi	K01	ofi_ins	ofi	ofi
ins	ins	K01	ofi_ins	ins	ins
rsa	rsa_dwe	L01	rsa_dwe	rsa	rsa
obs	obs	M01N01	obs	obs	obs
ros	ros	ros	ros	ros	ros
osg	osg	O01	osg	osg	osg
edu	edu	P01	edu	edu	edu
hht	hht	Q01	hht	hht	hht
dwe	rsa_dwe	L01	rsa_dwe	dwe	dwe

(Continued . . .)

Table A.3. Concordance between contributed African input-output tables (IOTs) and GTAP Sectors. (. . . Continued)

GTAP sectors	DR Congo	Mauritania	Mauritius	Angola
pdr	pdr	pdr	AgriProd	pdr
wht	wht	wht_gro	AgriProd	wht
gro	gro	wht_gro	AgriProd	gro
v_f	v_f	v_f	AgriProd	v_f
osd	osd	gtap5_8	AgriProd	osd
c_b	c_b	gtap5_8	SugCane	ocr
pfb	pfb_ocr	gtap5_8	AgriProd	ocr
ocr	pfb_ocr	gtap5_8	AgriProd	ocr
ctl	ctl	ctl	AnimProd	ctl
oap	oap_rmk	oap	AnimProd	oap
rmk	oap_rmk	rmk	AnimProd	rmk
wol	ctl	wol	AnimProd	oap
frs	frs	frs	Forest	frs
fsh	fsh	fsh	FishProd	fsh
coa	coa_oil	gas_coa_ox	CoalPt	coa
oil	coa_oil	oil	CrudeP	oil
gas	coa_oil	gas_coa_ox	CrudeP	oil
oxt	oxt	gas_coa_ox	Mining	oil
cmt	cmt	cmt_omt	FoodProd	cmt
omt	omt	cmt_omt	FoodProd	omt
vol	vol	vol	FoodProd	vol
mil	mil	mil	DairyPr	mil
pcr	pcr_ofd	pcr	OthFood	ofd
sgr	sgr	sgr_ofd	Sugar	sgr
ofd	pcr_ofd	sgr_ofd	OthFood	ofd
b_t	b_t	b_t	BeveToba	b_t
tex	tex	tex	Tex	tex
wap	wap	wap	Wap	wap
lea	lea	lea	OthManuG	lea
lum	lum	lum	WoodProd	lum
ppp	ppp	ppp	PaperProd	ppp
p_c	p_c	gtap32_34	CokeOven	p_c
chm	chm	gtap32_34	Chemical	chm
bph	bph	gtap32_34	Chemical	bph

(Continued . . .)

Table A.3. Concordance between contributed African input-output tables (IOTs) and GTAP Sectors. (. . . Continued)

GTAP sectors	DR Congo	Mauritania	Mauritius	Angola
rpp	rpp	gtap32_34	RubPlast	rpp
nmm	nmm	nmm	ONonMeta	nmm
i_s	i_s_nfm	gtap37_39	BasMetal	fmp
nfm	i_s_nfm	gtap37_39	BasMetal	ome
fmp	fmp	gtap37_39	FabMetPr	fmp
ele	ele	gtap40_42	ElMedc	omf
eeq	eeq_ome	gtap40_42	Media	omf
ome	eeq_ome	gtap40_42	OffEquip	ome
mvh	mvh_otn	mvh	TransEqu	otn
otn	mvh_otn	otn	TransEqu	otn
omf	omf	omf	Furniture	omf
ely	ely_gdt	ely_gdt	ElectSer	ely
gdt	ely_gdt	ely_gdt	ElectSer	ely
wtr	wtr	wtr	WaSewWat	ely
cns	cns	cns	Const	cns
trd	trd	trd	Trade	trd
afs	afs	afs	AccomSer	afs
otp	otp	otp	Transpo	otp
wtp	wtp	wtp	Transpo	atp
atp	atp	atp	Transpo	wtp
whs	whs	whs	Transpo	whs
cmn	cmn	cmn	PubPostI	cmn
ofi	ofi	ofi	Finance	ofi
ins	ins	ins	Finance	ins
rsa	rsa	rsa_dwe	RealEst	rsa
obs	obs	obs	Services	obs
ros	ros	ros	LeisureS	ros
osg	osg	osg	Governm	osg
edu	edu	edu	Ed	edu
hht	hht	hht	HealSoc	hht
dwe	dwe	rsa_dwe	RealEst	dwe

Table A.4. Terms-of-trade changes (%) after US tariff of 15% in African countries.

Country	GTAP 10 (2014)	GTAP 12 (2014)	GTAP 12 (2023)
Algeria	-0.296	-0.569	0.159
Egypt	-0.325	-0.303	-0.191
Morocco	-0.263	-0.006	-0.256
Tunisia	-0.061	0.052	-0.035
Benin	0.488	-0.336	-0.086
Burkina Faso	-0.105	0.205	0.144
Cameroon	-0.097	-0.304	0.033
Ivory Coast	-0.233	-0.239	-0.153
Ghana	-0.378	-0.343	-0.219
Guinea	-0.094	-0.216	0.128
Mali	-0.458	0.182	0.048
Mauritania	-0.458	-0.659	-0.042
Niger	-0.458	0.017	-0.035
Nigeria	-0.650	-1.290	-0.080
Senegal	0.268	0.109	-0.030
Togo	-0.166	-0.808	0.176
Angola	-0.574	-0.835	0.019
Central African Republic	-0.592	-0.498	0.021
Chad	-0.592	-2.648	-0.239
Republic of the Congo	-0.592	-0.412	-0.051
Democratic Republic of the Congo	-0.574	-0.205	-0.063
Equatorial Guinea	-0.592	-1.072	-0.965
Gabon	-0.592	-0.967	-0.127
São Tomé and Príncipe	-0.592	0.153	-0.081
Burundi	-0.086	0.168	-0.443
Comoros	-0.086	-0.0005	-0.182
Ethiopia	0.033	-0.050	0.103
Kenya	-0.270	-0.473	-0.468
Madagascar	-0.312	-0.233	-0.601
Malawi	-0.275	-0.502	-0.976
Mauritius	-0.596	-0.581	-0.504
Mozambique	-0.068	-0.338	0.215
Rwanda	-0.430	-0.500	0.035

(Continued . . .)

Table A.4. Terms-of-trade changes (%) after US tariff of 15% in African countries.
(. . . Continued)

Country	GTAP 10 (2014)	GTAP 12 (2014)	GTAP 12 (2023)
Sudan	-0.086	0.463	0.085
Tanzania	0.110	0.067	0.154
Uganda	-0.104	0.169	0.035
Zambia	0.430	0.374	0.145
Zimbabwe	-0.112	0.003	0.226
Botswana	-0.167	-0.223	0.075
Eswatini	-0.717	-0.019	0.022
Namibia	-0.106	-0.310	-0.243
South Africa	-0.153	-0.325	-0.360
Western Sahara	-0.296	-0.554	0.161
Libya	-0.296	-0.554	0.161
Cabo Verde	-0.458	-0.464	0.048
Gambia	-0.458	-0.464	0.048
Guinea-Bissau	-0.458	-0.464	0.048
Liberia	-0.458	-0.464	0.048
Saint Helena	-0.458	-0.464	-0.312
Sierra Leone	-0.458	-0.464	-0.312
Djibouti	-0.086	-0.560	-0.204
Eritrea	-0.086	-0.560	-0.204
Mayotte	-0.086	-0.560	-0.204
Seychelles	-0.086	-0.560	-0.204
Somalia	-0.086	-0.560	-0.204
South Sudan	-0.086	-0.560	-0.204
Lesotho	-0.717	-1.342	-0.365

Source: Authors.