Journal of Economic and Financial Sciences
ISSN: (Online) 2312-2803, (Print) 1995-7076

Targeting untapped intra-regional trade opportunities for trade integration in Africa

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Dates:
Received: 25 Mar. 2022
Accepted: 03 Oct. 2022
Published: 22 Nov. 2022

How to cite this article:
Ferreira, L., Steenkamp, E. & Rossouw, R., 2022, 'Targeting untapped intra-regional trade opportunities for trade integration in Africa', *Journal of Economic and Financial Sciences* 15(1), a779. https://doi.org/10.4102/jef.v15i1.779

Orientation: Although all African governments recognise the importance of stimulating greater intra-regional trade, the process of turning policy into action has proved to be difficult.

Research purpose: Several studies have examined the broad effects of free trade areas in Africa and how the removal of tariffs and other trade barriers impacts member countries. However, no studies appear to have been conducted on the effects of a targeted reduction in trade divisions based on untapped export potential.

Motivation for the study: Many divisions stifle trade on the African continent, from limited market access and poor infrastructure to unwieldy regulatory frameworks and a lack of information on trade opportunities that hinder greater intra-regional trade.

Research approach/design and method: This study sets out to address the research gap by translating the potential trade values of the identified untapped intra-regional trade opportunities between African countries into (Global Trade Analysis Project) GTAP model shocks. This involved determining what the increase in trade efficiency (or reduction in trade divisions) must be, in addition to the removal of all tariffs, to deliver the estimated potential increase in trade for the identified trade opportunities.

Main findings: The study found that in addition to the removal of tariffs, targeted increases in trade efficiency phased in over time produce much higher economic gains than a once-off trade efficiency shock.

Practical/managerial implications: The welfare gains of many of the smaller African economies are higher under this phased approach, and it is not mostly the bigger, more industrialised economies that benefit most.

Contribution/value-add: The results cast new light on the potential of African countries to leverage untapped trade opportunities to increase intra-regional trade among small and large economies alike.

Keywords: intra-regional trade; trade barriers; trade efficiency; trade opportunities; trade integration; Africa; GTAP.

Introduction

Sustained growth in intra-regional trade is believed to be one of the most important drivers of economic diversification and inclusion. Intra-regional trade and integration is a particularly important topic in Africa as part of the continent's development strategy and has been on government agendas ever since African countries gained their political independence (Songwe 2019; UNCTAD 2013, 2021).

However, turning political will and policy directives into action has proved difficult, with the result that stronger regional trade and integration have been slow to manifest in the African continent (AU et al. 2017). Numerous divisions continue to stifle trade in Africa, including a lack of access to markets, inadequate infrastructure, unwieldy regulatory frameworks, and a lack of information on trade opportunities (WEF 2016; World Bank 2012).

At the 30th Meeting of the Sectoral Council of Ministers (EAC 2014), it was emphasised that African countries should give greater attention to the gains to be made from real intra-regional trade than to lost revenue from a reduction in tariffs. The success of increased regional trade requires action from both the demand and the supply sides. Ferreira and Steenkamp (2020) investigated trade opportunities in the Tripartite Free Trade Area (TFTA), which aims to enhance connectivity and production linkages between EAC (East African Community),

SADC (Southern African Development Community) and COMESA (Common Market for Eastern and Southern Africa) member countries. They found that nearly 70% of trade opportunities among TFTA countries are unrealised, showing that countries outside the region are supplying the import demand for products that could have been sourced from within the region.

While several studies have explored the economic effects of free trade agreements in Africa (Mevel & Karingi 2012; Mold & Mukwaya 2017; Pasara & Dunga 2020; Saygili, Peters & Knebel 2018; Willenbockel 2013), it appears that none has investigated the effects of realising specific, realistic – but unexploited – trade opportunities among African countries. This article aims to arrive at a better understanding of how taking a targeted approach to increasing intra-regional trade – in addition to removing tariffs – can impact and benefit countries.

The next section offers a review of relevant empirical studies on the impact of regional integration within Africa. Subsequent sections describe the computable general equilibrium (CGE) model and the analytical approach used in the current study, followed by a discussion of the simulation results. The article ends with a conclusion and policy recommendations.

Literature review: The impact of regional trade integration in Africa

Given the weight of theory and the dynamic economic opportunities in many African countries, trade among these countries should have far exceeded their current levels. With the push for unilateral, bilateral and multilateral trade liberalisation on the African continent, one would expect to see strong growth in trade among African countries (Jordaan 2014). However, this has not come about, despite numerous discussions, negotiations and policy initiatives. This indicates a disconnect between governments' attempts to facilitate trade and the actions of traders operating at the coalface.

Various studies have been conducted on regional economic integration, especially in Africa, using partial equilibrium analyses, CGE models and econometric models. This section examines previous CGE studies on regional trade and integration among African countries.

Although there is a long history of CGE models being used for policy analysis in developed countries, their use in policy formulation and analysis in Africa is relatively recent. With African governments increasingly looking for ways to improve their economic policies and realising the importance of research as an aid to policy formulation and implementation, there has been a significant increase in the use of CGE models in Africa (Hammouda & Osakwe 2008). As a result, the Center for Global Trade Analysis has expanded the number of African countries featured in the GTAP database.

Several studies have focused on the African Continental Free Trade Area (AfCFTA) and its potential economic impact. For instance, Mevel and Karingi (2012) studied the potential effects of the AfCFTA and a continental custom union (CU). Their results showed that the implementation of the AfCFTA could lead to a substantial increase in trade among African countries. They further found that the formation of a continental CU would not trigger any additional increase in trade, over and above that brought about by the FTA.

Saygili et al. (2018) also used a CGE model (GTAP) to assess the potential long-term effects of the AfCFTA on African countries. The results indicated significant welfare gains, employment and output expansion, and intra-African trade growth in the long term. The findings also showed that the benefits are not equally distributed among member countries and that countries are likely to sustain some revenue losses in the short term.

Abrego et al. (2019) used a multi-country, multi-sector general equilibrium model to determine the welfare effects of the AfCFTA on 45 African countries. They used three different model specifications, comprising both perfect and monopolistic competition. The simulations included full elimination of import tariffs and partial reductions (35%) in non-tariff barriers (NTBs). The results indicated much potential for welfare gains from trade liberalisation among African countries. However, most of these gains would be from reductions in NTBs to increase trade efficiency, because intra-regional trade in Africa is already subject to low import tariffs.

Willenbockel (2013) used the GLOBE model, calibrated on the GTAP-8.1 database, to provide forecasts relating to the implementation of the TFTA. In his simulation, he used 2007 as the benchmark year to generate a dynamic forward projection to the year 2014. The simulation analysis considered eight different trade integration scenarios, with varying levels of ambition in terms of regional coverage, product coverage and trade facilitation efforts. However, the key message from the author's simulation emerged from the most ambitious scenario (Scenario 8) which combined complete tariff liberalisation for all intra-TFTA trade with a 5% reduction in NTBs to increase trade efficiency. The results showed that the projected aggregate net benefits for the TFTA amounted to over $3.3 billion per year, which is more than five times the gains realised from full intra-TFTA tariff liberalisation alone. In addition, trade volumes among TFTA countries were projected to increase by nearly 20%, to a value of $7.7bn. Moreover, the study revealed significant sectoral production effects with correspondingly significant implications for sectoral employment. These were concentrated in a subset of sectors – mainly sugar products with backward linkage effects to sugar cane production, beverages and tobacco and light manufacturing.

Walters, Bohlmann and Clance (2016) analysed the effects of the TFTA on the South African economy using a GTAP CGE model and version 8.1 database. Their results showed that the

South African economy would gain from the implementation of the TFTA, with GDP (Gross Domestic Product) increasing by more than 1%, accompanied by greater regional trade and general economic activity. In particular, the increase in exports would boost local industries, while cheaper imports would lead to stronger welfare gains for local consumers. The increase in trade and industrial activity would stimulate higher demand for endowments, capital and land, and skilled and unskilled labour.

Mold and Mukwaya (2017) modelled the economic impact of the TFTA to determine the implications for the economic geography of Southern, Eastern and Northern Africa, using a static CGE model. For the simulations, the authors used the GTAP-9 database. Their results indicated that the elimination of tariffs among member countries could result in a significant 29% increase in intra-regional trade, together with a welfare gain for the TFTA region to the value of $2.4bn. The sectors that would benefit the most are light and heavy manufacturing and processed foods. The study concluded that the increase in industrial production would not only be concentrated in larger countries with high productivity levels, such as South Africa and Egypt, but also smaller countries with lower productivity levels.

To summarise, several studies have been conducted to determine the effects of free trade agreements in Africa, such as those supporting the TFTA and the AfCFTA, on welfare, growth and development. However, the current study takes a much more targeted approach to promote intra-regional trade. It simulates the impact of realising untapped trade opportunities (exporter–product–importer combinations) among TFTA countries, as identified in Ferreira and Steenkamp (2020). Because the low levels of intra-African trade prove it difficult to translate policy into real increases in trade, these untapped intra-regional trade opportunities should be brought to the attention of importers, exporters, private sector organisations and policymakers as they represent 'low-hanging fruit' that, if effectively leveraged, could constitute the first practical steps towards addressing this problem.

Research method

Determining intra-regional trade potential

Importer–product–exporter data on matched, untapped trade opportunities between selected TFTA countries from Ferreira and Steenkamp (2020), were employed in this study to translate the potential trade values of these untapped trade opportunities into GTAP model shocks, a unique and somewhat unconventional approach in the implementation of this model. This was done to determine what the increase in trade efficiency (reduction in trade divisions) must be, in addition to the elimination of tariffs, to produce the estimated potential increase in trade for each importer–product–exporter combination. According to the World Bank (2012), trade divisions arise from impediments to economic integration, which restrict market access. A trade division can be viewed as anything that restricts the flow of goods, capital or people between countries. Fewer divisions are therefore the consequence of anything that improves or eases the flow of goods, capital or people between countries, including lower trade costs, reduced NTMs (non tariff measures) and increased border and logistics efficiency, to name a few.

The untapped intra-regional trade opportunities were identified as follows (Ferreira & Steenkamp 2020): firstly, the size and growth of import demand on an Harmonised System (HS) 6-digit product level for all 26 original TFTA countries were considered, following the methodology of Cuyvers et al. (1995), Cuyvers (1997, 2004) and Cuyvers, Steenkamp and Viviers (2012). Then the short-term (1 year) growth in import demand as well as the longer-term 5-year compounded growth rate were calculated. The import value indicated the size of import demand in each market.

Secondly, the cut-off criteria were set to determine which combinations showed sufficient size and growth in import demand in each market (Cuyvers 2004; Cuyvers et al. 1995, 2012). A market was only considered to have sufficient import growth if that particular country's import growth rate for a product was equal to or greater than the average world import growth rate for that product. In addition, the import size of a market for a particular product was only deemed sufficiently large if the import value was equal to or greater than 2% of total world imports of that product. The only markets that were selected as consistently large with a growing demand were those that met the criteria for short- and long-term import growth and market size for the 5 consecutive years for which the above-mentioned method was repeated (Ferreira & Steenkamp 2020).

Thereafter, the export supply capacity for the products that met the import demand criteria was determined. This was done by using the Revealed Comparative Advantage (RCA) of Balassa (1965) to determine whether a country had the ability to produce and export a particular product competitively. For a supply country to be selected, it had to meet the criterion of an RCA greater than or equal to 1 for each year in the five-year period (Ferreira & Steenkamp 2020).

This was followed by matching consistent import demand with export supply in the region to arrive at exporter–product–importer combinations – referred to as matches. Existing trade between these matches were also evaluated. Those product and export country combinations with high trade potential but no existing trade were considered unexploited or untapped (Ferreira & Steenkamp 2020).

Finally, the potential trade value for each identified untapped bilateral trade opportunity was calculated for the purposes of this study, using the total import value for each of the importers in the identified matches from the CEPII BACI[1] database divided by the total number of suppliers plus 1, to account for

1.BACI is a trade database, developed by the Centre d'Études Prospectives et d'Informations Internationales (CEPII) which is a French institute doing research into international economics, providing bilateral trade flows for more than 5000 products and 200 countries.

the new potential exporter identified as a match. From this formula, it is clear that the potential trade values were based on the importer's total demand. However, to make this potential value realistic from an exporter supply point of view, the following additional rule was applied. If the potential trade value calculated for a particular exporter–product–importer combination was more than 20% of the particular exporter's total exports of the product, the potential trade value was adapted to 4.42% of total exports, which was the average of all the other product–country combinations under consideration. For missing values and highly concentrated import markets (with only one or two main suppliers), the authors used the export potential values of the International Trade Centre's (ITC)'s Export Potential Map (2020).

These potential trade values were used to determine what the increase in trade efficiency (in addition to the elimination of tariffs) must be. The results revealed the simulated economy-wide effects of realising the specific untapped trade opportunities.

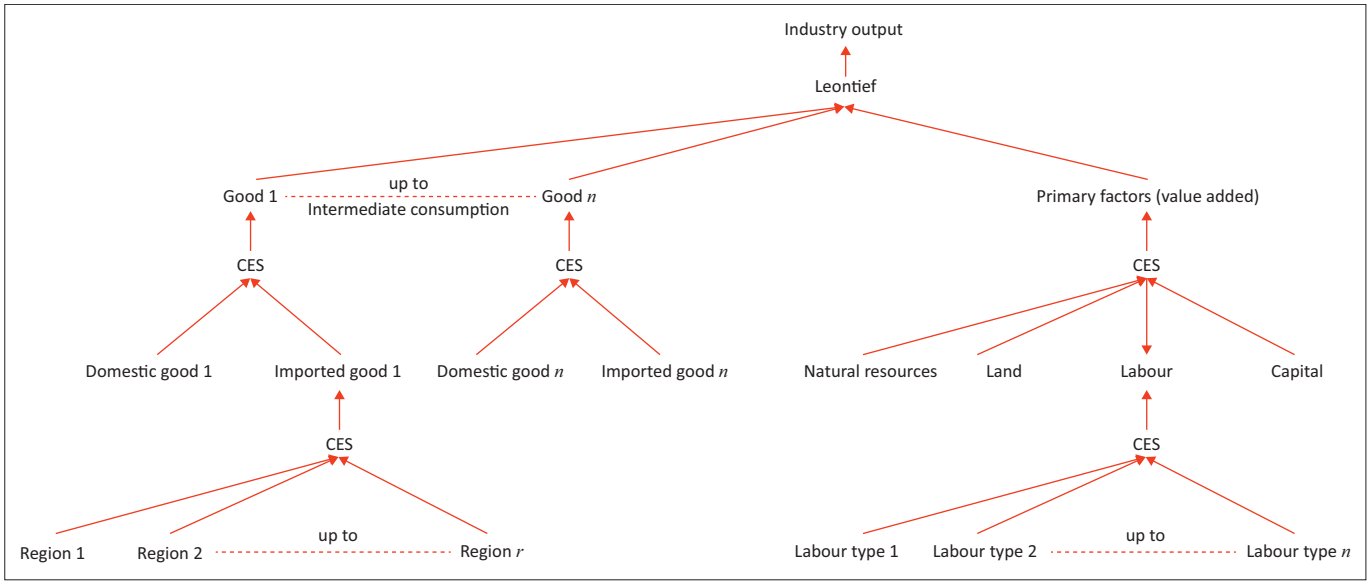
The dynamic GTAP model

Model closure and simulation design

In the present study, a CGE model was used to analyse the economy-wide effects of the identified trade opportunities between the TFTA countries. Adams (2005) specifies four tasks that make CGE-based analysis distinctive: (1) the theoretical structure of the model, (2) the calibration of the model, which includes the evaluation of the coefficients and parameters for the base year, (3) the simulation design, specifically the model closure, and (4) the interpretation of the simulation results.

A wide variety of CGE models exist for different applications. The GTAP model employed in this study is a dynamic CGE (GDyn) model that can assess policy changes and economic shocks within a global trade framework. GDyn is a multi-sector, multi-region, recursive dynamic CGE model, developed by Ianchovichina and McDougall (2000). The GDyn model is calibrated to the GTAP-9 database, documented in Aguiar, Narayanan and McDougall (2016) for the benchmark year 2011, and contains most features of the GTAP model – including bilateral trade flows, inter-sector factor mobility and a consumer demand function. On the demand side, the representative consumer allocates income between public consumption, private consumption and savings in a Cobb-Douglas function. The 'Armington assumption', which allows for bilateral trade, assumes that consumer has a love of variety, that creates a demand for domestic and foreign goods within a product category (Ianchovichina & Walmsley 2012). The demand for private consumption follows the Constant Difference of Elasticities (CDE) function. The CDE function combines an expansion parameter to replicate income elasticities of demand with a substitution parameter to replicate desired compensated, own-price elasticities of demand. Furthermore, the function permits different income elasticities of demand for different commodities, allowing customers' budget allocation for luxury goods and necessities to shift in response to changes in their income (Burfisher 2016).

On the production side (illustrated in Figure 1), producers use five factors: labour (skilled and unskilled), natural resources, land and capital. The production side is described by Leontief technology. A Leontief specification is a particular case of the Constant Elasticity of Substitution (CES) and assumes that production factors will be used in fixed proportions (i.e. the production coefficient between primary and intermediate inputs are fixed). Primary factors are characterised as mobile across industries, with the Constant Elasticity of Transformation (CET) function describing the



Source: Adapted from Hertel, T., 1997, *Global trade analysis: Modeling and applications*, Cambridge University Press, New York, NY

CES, constant elasticity of substitution.

FIGURE 1: Structure of production in the GDyn model.

extent of their mobility. Furthermore, constant returns to scale and perfect competition are assumed to hold (Hertel 1997; Ianchovichina & Walmsley 2012). More detailed information on the GDyn database construction, parameterisation and various applications of the model is available in Ianchovichina and Walmsley (2012).

The GDyn database includes 57 sectors in 140 countries and/or regions in the world.[2] The model equations are based on microeconomic fundamentals that provide a comprehensive specification of household and perfectly competitive firm behaviour within regions as well as trade links between regions (Ferraz, Gutierre & Lemos 2016). McDougall et al. (2012) indicate that the GDyn provides improved handling of the long run within the GTAP framework by including international capital mobility, capital accumulation and an adaptive theory of investment (Hertel 1997).

The services sector was, however, excluded from the analysis; only physical goods were included. Under the GTAP model's default microeconomic closures, factor endowments are fixed and factor prices adjusted to restore full employment of the factors of production in the post-shock equilibrium. Alternatively, the return to capital or labour can be fixed and the supply of capital and labour adjusts to restore equilibrium. In the GDyn model, investment adjusts to changes in the rate of return. In addition, by fixing wage rates, the authors allowed for labour supply to adapt to changes in wages. In this regard, improved trade efficiency generates 'endowment' effects, that is, the amount of labour and capital in an economy changes based on changes in returns to labour and capital. The authors adopted a closure where the current account adjusts, as this is a more realistic assumption for small, open economies.

The GTAP model employs the Armington assumption in the trading sector, which explains the intra-industry trade in substitute goods and the possibility of a distinction being made between imports based on their origin. One can then assume that imported commodities are separated from goods produced domestically and combined as an additional nest in the production tree. The substitution elasticity in this nest is equal across all uses. Firms will determine the optimal combination of imported and domestic goods based on imports and the resulting combined import price (Fox, Francois & Londono-Kent 2003). It is, however, important to note that there are a number of limitations when using a global trade model like GTAP, including the high levels of informal trade between neighbouring countries in Africa, the impacts of which are difficult to model.

2.For the analysis, the data were aggregated into 21 countries and regions (Botswana, Egypt, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, South Africa, South Central Africa [Angola and the Democratic Republic of the Congo]*, Tanzania, Uganda, Zambia, Zimbabwe, Rest of Eastern Africa [Burundi, Comoros, Djibouti, Eritrea, Seychelles, Sudan]*, Rest of SACU (Southern African Customs Union) [Lesotho and Swaziland]*, Rest of North Africa [Libya]*, Rest of the world [126 remaining GTAP-9 countries]. Note: *These are countries that are only available as part of regional groupings in GTAP and eight sectors (grains and crops, livestock and meat products, mining and extractions, processed food, textiles and clothing, light manufacturing, heavy manufacturing, services).

Baseline projections

The baseline scenario, which represents the path of development for each country or region's economy with no changes to the status quo, was run up to 2024. The nature of any long-term projection is fundamentally speculative. However, the most important output is found in the deviations from the baseline under the various scenarios and not in the actual forecast. The deviations from the baseline can provide better answers to policy questions such as the impact of exploiting untapped intra-regional trade opportunities, given that the baseline provides the most accurate view of projected growth in each country or region without any policy intervention.

The GDyn database was projected to 2024, based on historical and projected data for GDP (PPP), population, and skilled and unskilled labour supply from 2011 to 2024. The data were collected from the International Monetary Fund (IMF) World Economic Outlook Database (July 2019). The model base year was therefore 2011, and the IMF's near-term projections up until 2024 were used. The results of the scenarios were measured against the baseline scenario.

Modelling the impact of the Tripartite Free Trade Area on member countries

Using potential trade values for the identified untapped, matched importer–product–exporter trade opportunities discussed in section 'Determining intra-regional trade potential', the authors estimated the impact on various economic variables of a reduction in tariffs and/or other trade divisions to equal the calculated potential increase in trade for each country. The following scenarios were run:

- **Scenario 1:** Elimination of all tariffs between the African countries included. Assumes that all tariffs will be fully eliminated.
- **Scenario 2a:** Once-off efficiency shock in 2019. Potential trade values are used to determine the extent to which trade efficiency should be increased (or trade divisions reduced) to realise the identified trade opportunities, in addition to all tariffs being removed.
- **Scenario 2b:** Efficiency phased in over a 3-year period. This approach reduces trade divisions over time, in addition to all tariffs being removed.

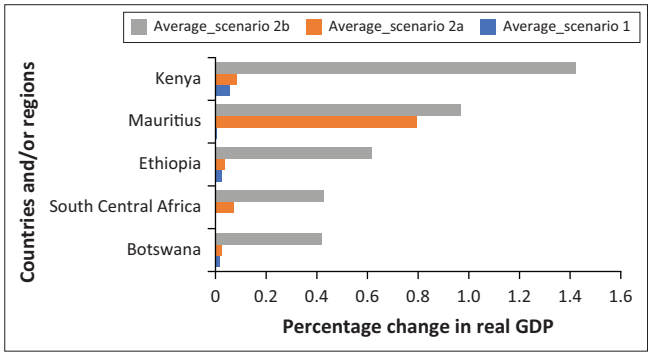
The next section provides the simulation results and discusses the macroeconomic implications for the TFTA countries in question.

Discussion of results

There seems to be a disconnect between governments' attempts to facilitate trade in Africa and the activities of private sector companies who actually trade. As the first step towards regional integration and increased intra-regional trade is normally the elimination of tariffs, combined with increased trade efficiency through a reduction in NTMs and other barriers to trade efficiency, policymakers often adopt a broad approach when negotiating and implementing free

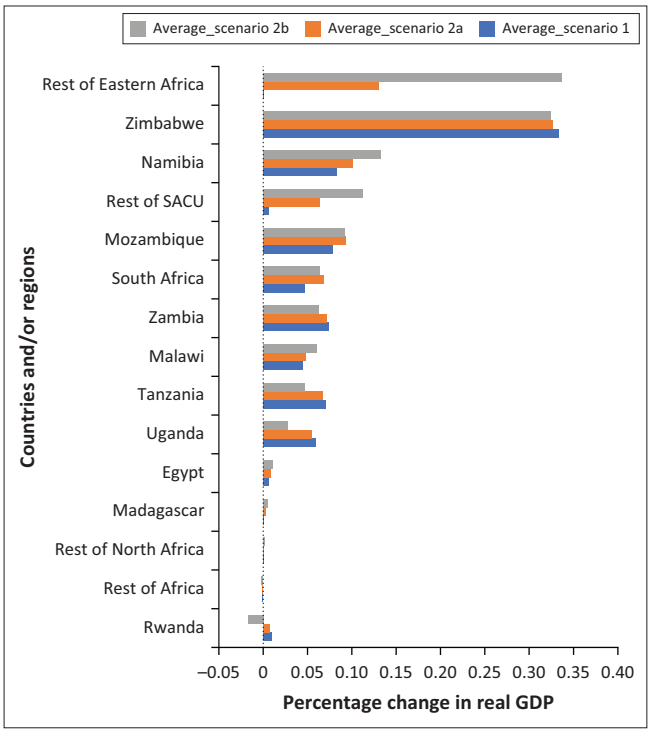
trade agreements (Mhonyera 2020; WTO & UNCTAD 2012). However, a reduction in trade divisions – poor infrastructure, high trade costs, border inefficiencies, uneven network readiness, inadequate market information and NTMs – is not easily implemented. Therefore, a targeted, more practical approach, as simulated in the article, may be a more efficient way of achieving higher intra-regional trade and integration. This study therefore analyses the possible economic and welfare gains arising from a targeted approach to increasing trade efficiency, combined with the elimination of all tariffs.

Figure 2 and Figure 3 illustrate the projected changes in real GDP after the implementation of all three scenarios. Figure 2 illustrates the projected average percentage changes in real GDP in the top five performing countries and/or regions, while Figure 3 illustrates the same data for all countries and/or regions not ranked among the top five. The results clearly show that the highest growth is when these changes are phased in over time (Scenario 2b), especially in Kenya (1.42%), Mauritius (0.97%) and Ethiopia (0.62%). From the once-off efficiency gains (Scenario 2a), Mauritius (0.97%), Zimbabwe (0.32%) and the rest of Eastern Africa (Burundi, Comoros, Djibouti, Eritrea, Seychelles and Sudan) (0.13%) are ranked in the top three.



GDP, gross domestic product.

FIGURE 2: Projected cumulative average percentage changes in real GDP in the top five performing countries/regions: 2019–2024 (ranked according to Scenario 2b results).



SACU; Southern African Customs Union; GDP, gross domestic product.

*, Take note of the difference in the scale used between Figure 2 and Figure 3.

FIGURE 3: Projected cumulative average percentage changes in real GDP in countries/regions other than the top 5: 2019–2024 (ranked according to Scenario 2b results).

The results also show that the smallest increase in GDP growth is in Scenario 1 (the removal of tariffs only), highlighting the importance of a targeted approach to reducing other trade divisions relating to unexploited trade opportunities. All countries/regions, except for Rwanda, show an increase in GDP growth. As mentioned previously, not all countries will benefit equally from the implementation of an FTA.

Figure 4 and Figure 5 show the projected changes in welfare for the African countries/regions included in each of the three scenarios modelled. Figure 4 provides a summary of the welfare changes in the top five performing countries and/or regions, while Figure 5 provides the same data for the countries/regions not ranked among the top five. Although positive gains are probable, these gains are expected to be distributed unequally among the countries and regions because of the different sizes of their economies, levels of export diversification, infrastructure and tariff revenue losses (Tanyi 2015).

It is clear that South Africa is the biggest winner in terms of welfare gains in Scenario 1, gaining substantially more than the rest of the countries when all tariffs are eliminated. Although significantly lower, Kenya, Egypt and Namibia also show an increase in their welfare gains in Scenario 1. Although there is a consensus that increased regional integration can lead to increased welfare for the whole region, it can also lead to uneven distribution of welfare among countries (AfDB 2014; Gurova 2014). For example, Mold and Mukwaya (2017) predict that bigger, more industrialised economies (such as South Africa and Egypt in this case) are more likely to benefit from the free trade agreement, at the expense of smaller, lesser developed countries. This is consistent with the findings of Walters et al. (2016), who found that South Africa will experience significant welfare gains as a result of the implementation of the TFTA.

It is also evident that more countries experience higher welfare gains in Scenario 2a than they do in Scenario 1, where only tariffs are removed. Although South Africa is clearly still the biggest winner in terms of welfare gains, Kenya, South Central Africa (Angola and the Democratic Republic of the Congo), Rest of Eastern Africa (Burundi, Comoros, Djibouti, Eritrea, Seychelles and Sudan) and Mauritius show much larger increases in welfare gains if compared with the gains in Scenario 1. This highlights how taking a targeted approach – reducing NTMs and other barriers to trade efficiency

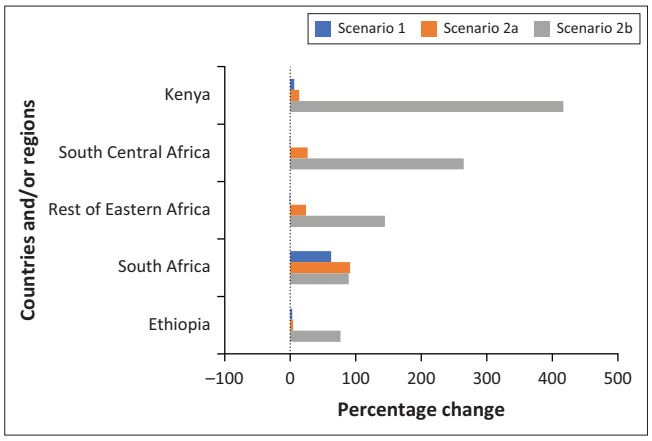
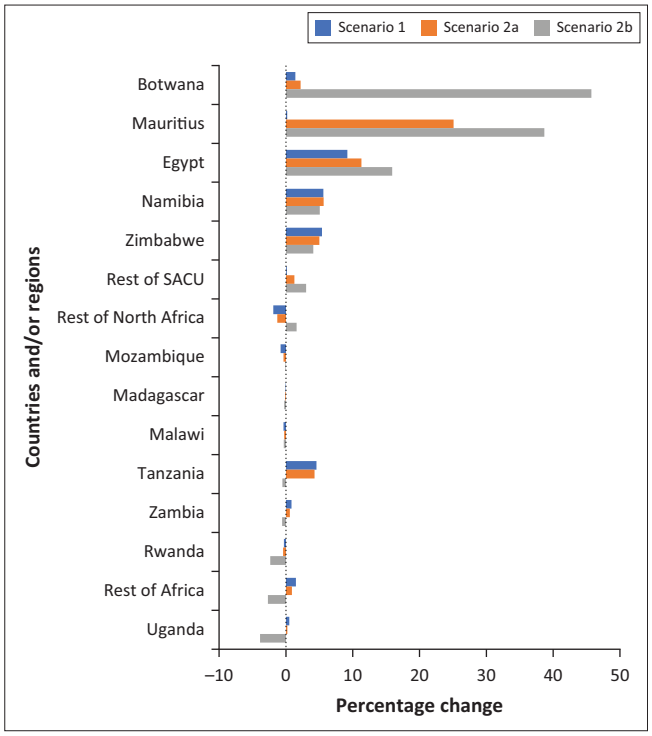


FIGURE 4: Summary of regional welfare changes in the top five performing countries/regions (% change in US$) (ranked according to Scenario 2b results).



*, Take note of the difference in the scale used between Figure 4 and Figure 5.

FIGURE 5: Summary of regional welfare changes (% change in US$) in countries/regions other than the top 5 (ranked according to Scenario 2b results).

impacting the unexploited trade opportunities – will also benefit smaller economies, rather than just the bigger industrialised economies.

In Scenario 2b, a different picture emerges of welfare gains among TFTA countries. By taking a targeted, phased-in approach to increasing regional trade, the simulation results show that more countries will experience significant increases in welfare gains. In this scenario, Kenya experiences the biggest gains, driven by the endowment effect and followed by terms of trade. South Central Africa (Angola and the Democratic Republic of the Congo) is in second place, with the biggest driver of welfare gains being technological change and endowment efficiency. The rest of the Eastern African countries (Burundi, Comoros, Djibouti, Eritrea, Seychelles and Sudan), Ethiopia, Botswana, Mauritius and Egypt also show considerably larger welfare gains than in Scenarios 1 and 2a. Although some countries still benefit more than others, the countries that notably benefit are more diversified in size.

In terms of production output on a sectoral level, the authors observed the largest impact in Scenario 2b for textiles and clothing in Botswana, manufactured goods in SACU (Southern African Customs Union) countries, processed food in South Central Africa as well as livestock and meat products, grains and crops and processed food in Ethiopia. For more detailed exporter–product–importer untapped export opportunities, see Ferreira and Steenkamp (2020).

When considering both the previous literature and the findings from this study, it is noteworthy that not only the larger, more industrialised economies gain from efforts to increase intra-regional trade, but also smaller economies, especially when a phased-in targeted approach is used to increase trade efficiency in addition to tariff liberalisation.

Conclusion and recommendations

Sustained growth in intra-African trade is believed to be one of the most important drivers of economic diversification and inclusion in the region, which in turn prompts deeper integration. However, turning policy intentions into action has proved to be a slow process in Africa. In particular, it has not been easy to reduce trade divisions in order to increase trade efficiency.

While other studies have investigated the economy-wide effects of FTAs in Africa using CGE analysis, many of these studies have simulated a broad approach to tariff liberalisation and a reduction in other trade barriers. The current study took an unconventional approach: it translated potential trade values calculated for untapped, realistic intra-TFTA trade opportunities into GTAP model shocks to determine what the increase in trade efficiency – lower trade costs, reduced NTMs and increased border and logistics efficiency, to name a few – must be, in addition to the removal of tariffs, to provide the estimated potential increase in trade. The analysis was therefore informed by matches between large and growing import demand and consistently competitive export supply that were not being leveraged by TFTA member countries. Ultimately, this study set out to show how taking a targeted approach to increasing intra-regional trade can impact and benefit member countries.

The literature supports the view that regional trade agreements will lead to increased trade as a result of the realignment of demand and supply within the region. Furthermore, increased aggregate demand, due to an increase in market size, will result in increased production across the region. Previous studies have found that increased intra-regional trade has overall positive effects both on the value of trade and the structure of exports. Although not all countries stand to benefit in equal measure from a trade agreement, it provides greater opportunities for returns to scale, a bigger market and

accelerated intra-regional trade, which will stimulate economic growth and enhance the welfare of citizens. The literature also suggests that it is mostly the largest economies in a region that take advantage of, and gain the most from, the expanded and liberalised market created by an FTA.

Using the GDyn model and the GTAP-9 database, the study analysed the economy-wide effects of realising the identified trade opportunities within the TFTA region, simulating three scenarios. Scenario 1 showed the results when all tariffs between TFTA member countries are removed. Scenario 2a showed what would happen if the identified trade opportunities are realised through the once-off implementation of increases in targeted trade efficiency, in addition to the removal of all tariffs. Finally, Scenario 2b showed the impact if the trade efficiency shocks for the realisation of the potential trade opportunities are phased in over time.

Based on the results, it was concluded that *how* trade efficiency measures are implemented matters. When the elimination of all TFTA tariffs is combined with a phased-in, targeted approach to reducing trade divisions/increasing trade efficiency (Scenario 2b), the projected changes in GDP and welfare are much higher than in a similar, once-off implementation (Scenario 2a). In addition, contrary to what was expected from the literature review, this study found that it is not only the largest TFTA economies that gain the most from tariff removal and phased-in increases in trade efficiency; smaller economies also gain notably in terms of real GDP and welfare. For instance, when only tariffs are removed (Scenario 1) and even when the additional trade efficiency shocks are implemented in a once-off fashion (Scenario 2a), South Africa is the biggest winner in terms of welfare gains among the TFTA countries. South Africa, however, ranks fourth in terms of aggregate welfare gain when the reduction in NTMs and other barriers to trade efficiency is implemented over time (Scenario 2b).

Overall, positive increases are observed in real GDP, with noteworthy changes seen in Scenario 2b for Kenya, Mauritius and Ethiopia. In terms of welfare gains, Kenya, South Central Africa (Angola and the Democratic Republic of the Congo) and Eastern Africa (Burundi, Comoros, Djibouti, Eritrea, Seychelles and Sudan) are among the biggest winners in Scenario 2b.

Adopting a targeted, phased-in approach to increasing trade efficiency, together with the removal of tariffs, can therefore also benefit countries other than the largest economies, as they become more diversified, and their welfare is increased. African countries have adopted a broad policy approach to increasing intra-regional trade, with very modest results to date. This study showed that when tariff liberalisation is combined with a targeted approach to increasing trade efficiency based on unexploited intra-regional trade opportunities, smaller economies in the region can also benefit.

The main policy message emanating from these results is that governments should consider the possible gains from real intra-regional trade relative to the revenue lost due to a reduction in tariffs. Gathering accurate information on untapped intra-regional trade opportunities, applicable trade barriers and the potential impact of realising this potential is therefore crucial. This information, combined with the necessary implementation commitment, can potentially drive stronger intra-regional trade and deeper integration among African countries. This, in turn, will help to strengthen Africa's position in the global economy and give the continent's development efforts greater traction.

Acknowledgements

Competing interests

The authors have declared that no competing interest exists.

Authors' contributions

This article forms part of a PhD study of the Trade and Development (TRADE) research focus area of the North-West University. All authors assisted with the conceptualisation, composition and finalisation of the article.

Ethical considerations

This article followed all ethical standards for research without direct contact with human or animal subjects.

Funding information

This research was financially supported by the World Trade Organization (WTO). Opinions expressed and conclusions arrived at in this article are those of the authors and should not necessarily be attributed to the WTO.

Data availability

Secondary data was used in the analysis of this article and is publicly available. Data sources are indicated in the methodology section of the article.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

References

Abrego, L., Amado, M.A., Gursoy, T., Nicholls, G.P. & Perez-Saiz, H., 2019, *The African Continental Free Trade Agreement: Welfare gain estimates from a general equilibrium model*, IMF Working paper WP/19/124, viewed 10 February 2020, from https://www.imf.org/en/Publications/WP/Issues/2019/06/07/The-African-Continental-Free-Trade-Agreement-Welfare-Gains-Estimates-from-a-General-46881

Adams, P.D., 2005, 'Interpretation of results from CGE models such as GTAP', *Journal of Policy Modelling* 27(8), 941–959. https://doi.org/10.1016/j.jpolmod.2005.06.002

African Development Bank (AfDB), 2014, *Tracking Africa's progress in figures*, viewed 12 August 2019, from https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Tracking_Africa%E2%80%99s_Progress_in_Figures_-_Infrastructure_Development.pdf.

African Union (AU), Economic Commission for Africa (ECA), African Development Bank (AfDB) & United Nations Development Programme (UNDP), 2017, *Africa sustainable development report*, viewed 12 June 2019, from http://www.africa.undp.org/content/dam/rba/docs/Reports/AGENDA2063_WEB_FULL-EN.pdf.

Aguiar, A., Narayanan, B. & McDougall, R., 2016, 'An overview of the GTAP 9 Data Base', *Journal of Global Economic Analysis* 1(1), 181–208. https://doi.org/10.21642/JGEA.010103AF

Balassa, B., 1965, *Trade liberalisation and revealed comparative advantage*, Yale University Economic Growth Center, New Haven, CT.

Burfisher, M., 2016, *Introduction to computable equilibrium models*, 2nd edn., Global Trade Analysis Project (GTAP), Purdue University, West Lafayette, IN, viewed 12 May 2020, from https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=4841.

CEPII, 2020, *BACI*, viewed 10 January 2020, from http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=37.

Cuyvers, L., 1997, 'Export opportunities of Thailand: A decision support model approach', *Journal of Euro-Asian Management* 2(2), 71–97.

Cuyvers, L., 2004, 'Identifying export opportunities: The case of Thailand', *International Marketing Review* 21(3), 255–278. https://doi.org/10.1108/02651330410539611

Cuyvers, L., De Pelsmacker, P., Rayp, G. & Roozen, I., 1995, 'A decision support model for the planning and assessment of export promotion activities by government promotion institutions: The Belgian case', *International Journal of Research in Marketing* 12(2), 173–186. https://doi.org/10.1016/0167-8116(94)00021-F

Cuyvers, L., Steenkamp, E. & Viviers, W., 2012, 'The methodology of the Decision Support Model (DSM)', in L. Cuyvers & W. Viviers (eds.), *Export promotion: A decision support model approach*, pp. 183–284, Sun Press, Stellenbosch.

EAC, 2014, *30th meeting of the Sectoral Council of Ministers responsible for EAC Affairs and Planning underway in Arusha*, viewed 14 August 2019, from https://www.eac.int/press-releases/1586-30th-meeting-of-the-sectoral-council-of-ministers-responsible-for-eac-affairs-and-planning-underway-in-arusha.

Ferraz, L., Gutierre, L. & Lemos, C., 2016, 'Trade facilitation, global value chains and income inequality', presented at the 19th annual conference on global economic analysis, Washington, DC, USA, Global Trade Analysis Project (GTAP), Purdue University, West Lafayette, IN, viewed 20 August 2019, from https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=5013.

Ferreira, L. & Steenkamp, E.A., 2020, 'Identifying regional trade potential between selected countries in the African tripartite free trade area', *South African Journal of Economic and Management Sciences* 23(1), a2936. https://doi.org/10.4102/sajems.v23i1.2936

Fox, A., Francois, J.F. & Londono-Kent, 2003, 'Measuring border costs and their impact on trade flows: The United States-Mexican trucking case', presented at the 6th annual conference on global economic analysis, The Hague, The Netherlands, Global Trade Analysis Project (GTAP), Purdue University, West Lafayette, IN, viewed 16 April 2019, from https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=1282.

Gurova, I., 2014, 'A theoretical model for trade integration in the CIS region', *Problems of Economic Transitions* 57(3), 37–57. https://doi.org/10.2753/PET1061-1991570502

Hammouda, H.B. & Osakwe, P.N., 2008, 'Global trade models and economic policy analyses: Relevance, risks and repercussions for Africa', *Development Policy Review* 26(2), 151–170. https://doi.org/10.1111/j.1467-7679.2008.00403.x

Hertel, T., 1997, *Global trade analysis: Modeling and applications*, Cambridge University Press, New York, NY.

Ianchovichina, E. & McDougall, R., 2000, *Theoretical structure of dynamic GTAP*, GTAP Technical Papers, Paper 14, viewed 15 June 2019, from http://docs.lib.purdue.edu/gtaptp/14.

Ianchovichina, E. & Walmsley, T., 2012, *Dynamic modeling and applications for global economic analysis*, Global Trade Analysis Project (GTAP), Purdue University, West Lafayette, IN, viewed 10 June 2019, from https://www.gtap.agecon.purdue.edu/resources/res_display.asp ?RecordID=3169.

International Trade Centre (ITC), 2020, *Export potential map*, viewed 20 July 2019, from https://exportpotential.intracen.org/en/.

Jordaan, A.C., 2014, 'Regional integration in Africa versus higher levels of intra-Africa trade', *Development Southern Africa* 31(3), 515–534. https://doi.org/10.1080/0376835X.2014.887997

McDougall, R.A., Walmsley, T.L., Golub, A., Ianchovichina, E.I. & Itakura, K., 2012, 'An overview of the dynamic GTAP Data Base: The data base construction and aggregation programs', in E. Ianchovichina & T. Walmsley (eds.), *Global economic analysis: Dynamic modeling and applications*, pp. 120–135, Cambridge University Press, Cambridge

Mevel, S. & Karingi, S., 2012, 'Deepening regional integration in Africa: A computable general equilibrium assessment of the establishment of a continental free trade area followed by a continental customs union', paper presented at the 7th African Economic Conference, Kigali, Rwanda, 30th October–02nd November.

Mhonyera, G., 2020, 'Identifying priority products and sectors for bilateral trade negotiations: The case of AGOA beyond 2025', North-West University (Thesis – PhD), viewed 20 March 2021, from https://repository.nwu.ac.za/handle/10394/36414.

Mold, A. & Mukwaya, R., 2017, 'Modelling the economic impact of the tripartite free trade area: Its implications for the economic geography of Southern, Eastern and Northern Africa', *Journal of African Trade* 3(1), 57–84. https://doi.org/10.1016/j.joat.2017.05.003

Pasara, M. & Dunga, S., 2020, 'Who wins and who loses under the AfCFTA? A simulation analysis across ECOWAS countries', *International Journal of Economics and Finance Studies* 12(2), 487–504.

Saygili, M., Peters, R. & Knebel, C., 2018, *African continental free trade area: Challenges and opportunities of tariff reductions*, UNCTAD Research paper No. 15, viewed 14 April 2019, from https://unctad.org/en/PublicationsLibrary/ser-rp-2017d15_en.pdf.

Songwe, V., 2019, *Intra-African trade: A path to economic diversification and inclusion*, Brookings Institution, viewed 14 April 2019, from https://www.brookings.edu/research/intra-african-trade-a-path-to-economic-diversification-and-inclusion/.

Tanyi, K., 2015, 'Assessing Africa's two billion populated market by 2063: The facts and fallacies of a Continental Free Trade Area (CFTA)', *Business of Economics Journal* 6(154), 51–62. https://doi.org/10.4172/2151-6219.1000154

United Nations Conference on Trade and Development (UNCTAD), 2013, *Economic development in Africa report 2013. Intra-African Trade: Unlocking private sector dynamism*, viewed 15 December 2019, from http://www.tralac.org/images/docs/541/economic-development-in-africa-report-2013.pdf.

United Nations Conference on Trade and Development (UNCTAD), 2021, *Economic development in Africa report 2021. African Continental Free Trade Area for inclusive growth*, viewed 8 September 2022, from https://unctad.org/webflyer/economic-development-africa-report-2021.

Walters, L., Bohlmann, H.R. & Clance, M.W., 2016, *The impact of the COMESA-EAC-SADC Tripartite Free Trade Agreement on the South African Economy*, ERSA Working paper 635, September 2016, Department of Economics Working Paper Series, University of Pretoria.

Willenbockel, D., 2013, *General equilibrium assessment of the COMESA-EAC-SADC TFTA FTA*, MPRA Paper No. 51501, viewed 15 June 2019, from http://mpra.ub.uni-muenchen.de/51501/.

World Bank, 2012, *De-fragmenting Africa: Deepening regional trade integration in goods and services*, viewed 19 February 2020, from https://www.tralac.org/documents/news/2180-de-fragmenting-africa-world-bank-2012/file.html.

World Economic Forum (WEF), 2016, *The global enabling trade report 2016*, viewed 19 February 2020, from https://reports.weforum.org/global-enabling-trade-report-2016/#topic=highlights.

World Trade Organization (WTO) & United Nations Conference on Trade and Development (UNCTAD), 2012, *A practical guide to trade policy analysis*, viewed 19 February 2020, from https://www.wto.org/english/res_e/publications_e/practical_guide12_e.htm.