

African economic integration and trade

ABSTRACT

Economic integration ranks as one of the leading development strategies in Africa. The newly created African Continental Free Trade Area (AfCFTA) and the proposed Tripartite Free Trade Area (TFTA) linking three major regional blocks offer a new impetus to studying trade policy effects. Using a structural gravity model of bilateral manufacturing trade between the African Union member states and all countries in the world, the trade effects of African economic integration agreements (EIAs) are assessed. The findings suggest that economic integration, in aggregate, enhances total African exports. Disaggregating the effects by type of agreement and by subgroups of countries, free trade agreements (FTAs) and partial scope agreements (PSAs) are found to increase *extra*-African exports, but have no effects on *intra*-African exports. A positive and significant effect on intra-African exports is introduced when the FTA dummy is combined with AfCFTA in contrast to a neutral effect stemming from the joint FTA-TFTA dummy. The findings suggest that a continent-wide FTA yields greater benefits when compared with integrating the subregions.

JEL Classification: F14, F15, C23

Keywords: Economic integration, AfCFTA, Tripartite FTA, Gravity model, Africa

Data Availability Statement: The dataset is available at:
<https://zenodo.org/records/10078875>

Acknowledgements: We are very grateful to the Editor and the two anonymous Reviewers for their detailed comments and suggestions that have substantially improved the paper.

1. INTRODUCTION

Economic integration agreements (EIAs) have proliferated since the 1990s, prompting much interest in studying their effects on trade.¹ Following broader trends, a plethora of EIAs have been created in Africa – within the continent and beyond. Since gaining independence, most African countries have embraced regional integration as an important strategy towards breaking from the economically dependent trading patterns in the past (Foroutan and Pritchett 1993), stimulating trade with each other (Omilola 2011) and unifying the continent in the post-colonial era (de Melo and Tsikata 2015).² The prevalence of small African countries vying to enhance bargaining power and the desire of landlocked countries to strengthen trade and development co-operation with coastal neighbours serve as additional motives for intra-regional integration (Geda and Seid 2015).

While promoting intra-regional trade has long been a priority for African policymakers, a key issue is whether intra-African integration is best achieved by integrating the subregions or the continent as a unit itself. The 1980 Lagos Plan of Action proposed that Regional Economic Communities (RECs) be created as the basis for pan-African unity and continental industrialisation. The 1991 Abuja Treaty set out a road map to create a single market whereby the RECs would provide the building blocks for more policy co-ordination and trade expansion across the continent. Nearly three decades later,

¹ As of 1 August 2023, 360 EIAs are in force, corresponding with 593 notifications to the World Trade Organisation (WTO) when goods, services and accessions are counted separately (WTO 2023).

² The legacy of colonialism includes an African configuration of arbitrary borders and ethnic, cultural and linguistic diversity that have contributed to the continent's high trade costs and its many conflicts (de Melo and Tsikata 2015).

the African Continental Free Trade Area (AfCFTA) Agreement has become a reality with trading originally expected to begin in July 2020.³

So far, the verdict on the performance of intra-African integration is, at best, modest. Figures 1 and 2 show intra-regional trade as a share of total trade for the continent as a whole and for a selection of African EIAs over the years 1995-2018.⁴ Both the intra-African export shares and import shares have hovered around 13 per cent, with the former showing a more pronounced increase in the last decade. Put another way, most of Africa's trade is conducted not with itself, but with the rest of the world.

[Insert Figures 1 and 2 here]

Although the intra-African trade shares (in relative terms) are broadly unchanged over time, the trade volumes (in absolute terms) have grown substantially (Figures 3 and 4). Specifically, trade within Africa has risen more than ten-fold from a low base of US\$12.5 billion in 1990 to US\$155.7 billion in 2018, displacing the United States as its second most important trading partner.

Beyond the continent, Africa's main trading partners have become more diverse economically and geographically in line with the wider shift away from North-South integration towards South-South integration and cross-regional integration. Africa's main trading partners now include Western countries (the European Union and the United States), emerging economies (China, India, Brazil, Turkey, Indonesia and Russia) and

³ The AfCFTA Agreement entered into force on 30 May 2019 for the 24 countries that had deposited their instruments of ratification (Tralac 2023). Trading was originally expected to begin on 1 July 2020, but was postponed because of the covid-19 pandemic.

⁴ Direct comparisons of intra-regional trade shares are difficult because they depend not only on the degree of integration, but also other factors including geography, economic activity and competitiveness (OECD 2005; Iapadre and Luchetti 2010). Most notably, trade shares are particularly sensitive to the number and size of countries such that a region with many small countries will be more integrated compared with a region of the same size, but with fewer countries (Anderson and Norheim 1993; Frankel 1997; Iapadre and Luchetti 2010).

Middle Eastern countries (United Arab Emirates and Saudi Arabia). Yet, despite the European Union's decline in relative importance, it remains Africa's most important group of trading partners, implying African trade patterns are still shaped by historical relations dating back to the colonial era (see the Appendix Table A1 for the list of historical colonial linkages with European countries).

[Insert Figures 3 and 4 here]

Mapping the evolutionary phases of integration helps explain the poor performance of intra-African integration (de Melo and Tsikata 2015). In the early phase, African countries sought to develop independently from their former colonial adversaries and adopted an inwards approach to integration by promoting free trade at the regional level and applying high tariffs at the international level. Commitment to pan-African integration, however, was weakened by divergent interests and a reluctance to accept subsidiarity to a supranational authority. The second and more outwards phase of African integration brought about a renewed interest in creating new agreements and implementing previous initiatives, but with the consequences of multiple membership, conflicting objectives and complicated political and institutional requirements. In short, the creation of RECs at different time periods with overlapping membership and poor policy co-ordination have led to ineffective outcomes (Diouf 1994).

Factor endowment similarities also play a role in explaining Africa's low levels of intra-regional trade. Africa is abundant in natural resources, ranging from oil and natural gas to valuable metals and minerals.⁵ High external demand for primary commodities has induced strong inter-continental trade. Indeed, Africa's exports to the rest of the world are

⁵ One-tenth of the world's oil, one-third of all mineral deposits and two-thirds of all diamonds are produced in Africa.

dominated by unprocessed, resource-based commodities (UNCTAD 2019).⁶ The dependence on primary commodities and specialisation in a narrow range of goods, however, limits the scope for trade with other African countries (Rekiso 2017; UNCTAD 2019). In other words, countries made rich by nature share similar resource endowments, produce similar goods for export and therefore have low trade complementarity, implying negligible efficiency gains from specialisation in inter-industry trade (de Melo and Tsikata 2015). Nevertheless, Bouët *et al.* (2020) argue that export patterns within Africa are sufficiently dissimilar so as to allow some room for trade expansion within the continent.

On the other side, high levels of extra-African trade have been buoyed by preferential treatment, provided mainly by the rich countries to the poorer countries. In particular, Europe and the United States have offered concessions (typically in the form of lower tariffs on African exports) without requiring African countries to reciprocate. These unilateral preferential schemes include the European Union Generalised System of Preferences (GSP), first put in place in 1971 and the United States GSP, created by the Trade Act of 1974 and implemented in 1976. Extensions to these schemes include the European Union's Everything But Arms (EBA) scheme, launched in 2001, and the African Growth and Opportunity Act (AGOA), initiated by the United States in 2000.

Two main elements characterise these schemes (Collier and Venables 2007). First, preferential treatment ranging from lower tariffs to duty-free market access is offered to developing country exports. Second, participation constraints define eligible

⁶ Africa's exports of valuable metals include uranium (which is used in the production of nuclear energy), platinum (used in jewellery and industrial products), nickel (used in stainless steel and magnets), bauxite (used in aluminium) and cobalt (used in colour pigments). Africa's most valuable mineral exports are gold and diamonds.

countries, product selection and pre-specified rules of origin.⁷ More recently, reciprocal liberalisation that also opens African markets are replacing the unilateral preferences previously granted by the European Union.

Taken together, Fusacchia *et al.* (2022) summarise the three main features of Africa's economic integration agreements: (1) a web of intra-African trade agreements that include more ambitious customs unions and more flexible free trade areas; (2) a group of non-reciprocal extra-African preferential trade agreements that typically offer duty-free treatment to the poorer countries; and (3) a set of reciprocal extra-African trade agreements that will gradually apply tariff reductions in both directions and, in the process, open up African markets.

The newly created and ambitious continent-wide AfCFTA can accelerate Africa's changing patterns of trade in its favour. It offers a new impetus towards achieving long-held economic and political aims and aspirations to unite African countries and trade more with each other. When fully implemented, it will be the world's largest free trade area since the creation of the WTO in 1995, covering all African Union member states with a combined market value of US\$3 trillion and a population of 1.3 billion (Luke 2019). The single continental market for goods and services that will eliminate import tariffs between all African countries (on most products within a decade) should substantially raise intra-regional trade and spur economic growth.

As a stepping stone towards freeing up trade for the continent as a whole, an intermediate type of trading scheme has been proposed. The Tripartite Free Trade Area

⁷ In documenting the history of the GSP schemes, Cunha *et al.* (2005) draw attention to the possible tensions among developing countries arising from special and differential treatment. In a related manner, Persson (2015) focuses on the legal and economic aspects of non-reciprocal trade preferences and whether preferences have their intended effects of increasing and diversifying developing country exports.

(TFTA) will join up three of Africa's major regional blocks, namely the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC) and the Southern African Development Community (SADC), bringing together half of all African countries (and more than half of Africa's income and population) into a single free trade area.⁸ The aims of the TFTA include the harmonisation of trade regimes; the joint implementation of regional infrastructure projects; the development of regional value chains; and better regional co-operation through legal and institutional arrangements.

Geographically, the proposed Tripartite merger between COMESA, the EAC and the SADC creates a free trade area from Cairo to Cape Town and, in separating the Eastern and Southern regions from the non-Tripartite countries in the Northern and Western regions, splits the African continent in two. The geographic gap can also be considered as a historic and an economic gap. In this vein, Subramanian and Tamirisa (2001) have separately analysed the Eastern and Southern region (referred to as Anglophone Africa) and the Central and Western region (referred to as Francophone Africa) on the grounds of notable differences between institutions, policies and pathways to regional and global integration.

There is a large empirical literature on the effects of economic integration in Africa. In an early study, Elbadawi (1997) examines the trade effects of monetary unions and regional trade schemes for the sub-Saharan African countries within the gravity model framework. In a similar vein, Carrère (2004) uses an augmented gravity model to assess the trade effects of monetary unions and regional trade agreements (RTAs) for the

⁸ Negotiations for the formation of the TFTA began at the first Tripartite Summit held in Kampala on 22 October 2008. The decision to proceed with establishing the TFTA was taken with the signing of the TFTA in Cairo on 10 June 2015. The TFTA Agreement will enter into force when it is ratified by 14 member states.

sub-Saharan African countries (intra-African trade) and for African trade with the rest of the world (extra-African trade). More recently, Mukwaya (2019) uses a structural gravity model to estimate the effects of African EIAs on intra-regional manufacturing exports.

The effects of proposed agreements have also been studied using the gravity model. For example, McCormac *et al.* (2019) estimate the effects of AfCFTA on intra-African trade based on historical data while Geda and Yimer (2019) combine the gravity model with trade indices to study the effects of AfCFTA's tariff reduction protocol on intra-African merchandise trade.

Using a comprehensive panel dataset of bilateral manufacturing trade comprising international and intra-national trade between the African Union member states and all countries in the world over the 1995-2020 period, the trade effects of African EIAs are assessed. Two distinguishing features characterise this paper.

First, the effects of economic integration on African trade are estimated for the full range of reciprocal African EIAs that are in force, within the continent and beyond. This entails quantifying the effects of aggregated EIAs on total African trade (estimated separately with bilateral exports and bilateral imports as the dependent variable) and the effects of disaggregated EIAs by type of agreement (customs unions, free trade agreements and partial scope agreements) and by subgroups of countries (intra-African trade, African trade that additionally includes other developing countries and total African trade with all countries in the world). Quantifying the effects of African EIAs is important towards assessing their effectiveness in raising levels of African trade.

Second, the effects of AfCFTA and TFTA on intra-African trade are estimated using two additional dummies. First, the free trade agreement (FTA) dummy (classified

by the WTO and compiled in Mario Larch's RTA database; Egger and Larch 2008) is modified to additionally include free trade between all African Union member countries. Second, the FTA dummy is expanded to include free trade between the member countries of three major regional blocks (COMESA, the EAC and the SADC) as part of the proposed Tripartite Free Trade Area (see the Appendix Table A2).

The main results are summarised as follows. First, for the overall EIA dummy that combines all types of trade-related agreements, the findings confirm the trade-enhancing effects of economic integration on total African exports, suggesting developmental consequences of EIAs. Second, disaggregating the effects of EIAs by type of agreement and by subgroups of countries, FTAs and partial scope agreements (PSAs) are found to have the desired beneficial effects on extra-African exports. For intra-African trade, however, none of the economic integration types accrue trade benefits, suggesting that the web of overlapping trade agreements in Africa has not delivered on the expected trade gains. Finally, expanding the FTA dummy to separately include free trade between the Tripartite FTA countries and free trade between all African countries respectively, AfCFTA is found to deliver on its primary objective of increasing intra-African trade in contrast to a neutral effect stemming from the joint FTA-TFTA dummy. The findings suggest that a continent-wide FTA yields greater benefits when compared with integrating the subregions.

The remainder of the paper is structured as follows. Section 2 presents the gravity model specification of bilateral trade and the estimation strategy. The data definitions and sources of information are provided in Section 3. Section 4 discusses the estimated effects of economic integration on African trade, split according to the overall effects of

EIAs on total trade; the disaggregated effects of EIAs by type of agreement and by subgroups of countries; and the combined effects of FTAs with AfCFTA and the Tripartite FTA respectively. Section 5 concludes.

2. MODEL SPECIFICATION AND ESTIMATION STRATEGY

2.1 The gravity model of trade

In its traditional form, the standard gravity model specification of trade determinants is specified as follows:

$$\ln T_{ij}^t = \beta_0 + \beta_1 \ln Y_i^t + \beta_2 \ln Y_j^t + \beta_3 \ln DIST_{ij} + \lambda_1 Z_{ij} + \eta_1 X_{ij}^t + \varepsilon_{ij}^t \quad (1)$$

where $\ln T_{ij}^t$ refers to the natural logarithm ($\ln$) of bilateral trade flows between countries i and countries j at time t ; $\ln Y_i^t$ and $\ln Y_j^t$ are the logarithmic values of national income for both countries; and $\ln DIST_{ij}$ is the logarithm of geographic distance between capital cities. The vector of time-invariant bilateral variables, Z_{ij} , comprises country-pair dummies that typically include an adjacent border as an indicator for geographic proximity; a common colonial history as an indicator for institutional proximity; and a shared language as an indicator for cultural proximity. The vector of time-varying bilateral variables, X_{ij}^t , caters for trade policy variables of interest, including trade-related agreements that are in force between countries; and ε_{ij}^t is the random error term.

Following recent developments in the theory-consistent gravity literature (Anderson and Yotov 2016; Yotov *et al.* 2016), the (parsimonious) model specification of trade determinants between Africa and all countries in the world is:

$$T_{ij}^t = \exp(\beta' EIA_{ij}^t + \gamma_i^t + \omega_j^t + \gamma \omega_{ij}) \times \mu_{ij}^t \quad (2)$$

where T_{ij}^t refers to bilateral manufacturing trade flows between the African Union member countries (countries i) and all countries in the world (countries j) over the time period 1995 to 2020 and the EIA_{ij}^t dummy denotes (reciprocal) economic integration agreements. The set of three-way fixed effects comprises exporter-time and importer-time fixed effects, γ_i^t and ω_j^t , to account for changes in (outward and inward) multilateral resistance over time and country-pair fixed effects, $\gamma\omega_{ij}$, to control for potential endogeneity of the EIA variable (Baier and Bergstrand 2007). Note that the national income variables in the traditional specification are absorbed by the time-varying country fixed effects and the time-invariant gravity covariates are absorbed by the country-pair fixed effects.

To capture the expected beneficial trade effects of African EIAs that are in force, the effects of aggregated EIAs (which combines all types of trade-related agreements into one dummy) and the effects of disaggregated EIAs (defined according to different types of agreements) are quantified.⁹ The EIAs follow the classification of the World Trade Organisation (WTO), which can be notified of one (or a combination) of the following types of agreements: (1) customs unions, (2) free trade agreements (3) partial scope agreements or (4) economic integration agreements.

Most African plurilateral trade-related agreements fall within the first three categories. First, customs unions eliminate tariffs among member countries and set a

⁹ Vicard (2009) has previously estimated the separate trade effects of economic integration according to four types of arrangements: preferential arrangements, FTAs, customs unions and common markets. In a similar vein, Stack and Bliss (2020) split the trade effects of economic integration according to EU membership, trade-related agreements (including FTAs and customs unions) and regional economic partnership agreements (EPAs).

common external tariff on imports from non-member countries, the latter requiring policy co-ordination to agree on tariff rates across the various import industries. Among the African countries, customs unions include the continent's major regional blocks (COMESA, ECOWAS, the EAC and SACU) and the CFA (Communauté Financière Africaine or African Financial Community) franc zone countries affiliated with two monetary unions (CEMAC and WAEMU). Greater depth of economic integration that harmonises monetary policy among member countries should have stronger effects on trade because of lower transaction costs relating to currency conversion and lower risks relating to exchange rate volatility (Rose 2000; Rose and Wincoop 2001; Carrère 2004).

Second, FTAs eliminate tariffs among member countries, but each member country retains its own external tariff on imports from non-member countries. An important implication of different external tariffs is that complicated rules of origin are often needed to distinguish between goods originating from member countries (with preferential treatment) and goods originating from third countries (without preferential treatment). In other words, determining the national source of a product – the amount of local content or processing – is necessary to claim preferential tariffs on goods traded between member countries and prevent tariff fraud with non-member countries (Sytsma 2021).

African FTAs are split between intra-African integration (SADC and Agadir) and extra-African integration that includes FTAs with the European Union, also known as economic partnership agreements (EPAs). In line with the growing trend to extend the set of policies covered by trade agreements (Hofmann *et al.* 2019), the main aims of the trade and development EPAs are to provide duty-free and quota-free access to the European

Union market; foster trade related co-operation; and promote sustainable development through investment. These reciprocal regional EPAs are compatible with WTO rules and replace the unilateral preferences previously granted by the European Union to the African, Caribbean and Pacific (ACP) countries, many of which are former colonies.

Third, PSAs usually reduce (rather than eliminate) tariffs on imports for a selected (rather than a full) range of product categories. Most notable among the PSAs is the Global System of Trade Preferences (GSTP). Aimed at promoting intra-developing country trade, it offers preferential trade concessions to over 40 countries from across the globe. South-South co-operation is also at the heart of the MERCOSUR–SACU preferential agreement, which offers tariff concessions on more than a thousand product lines. A summary of Africa’s plurilateral trade-related agreements is provided in the Appendix (Table A3).¹⁰

To model the effects of AfCFTA and TFTA that are aimed primarily at increasing intra-African trade, two additional dummies have been constructed. First, the FTA dummy (classified by the WTO and compiled in Mario Larch’s RTA database; Egger and Larch 2008) is modified to additionally include free trade between all African Union member countries from the year 2019 onwards, coinciding with the official year of ratification for AfCFTA. Second, the FTA dummy is expanded to include free trade between the member countries of three major regional blocks (COMESA, the EAC and

¹⁰ In the analysis, the effects of EIAs that came into force during the sample period (1995-2020) are quantified (and not the full list of African plurilateral trade-related agreements shown in the Appendix).

the SADC) from the year 2008 onwards, coinciding with the start of the negotiations for the Tripartite FTA.^{11, 12}

2.2 Estimation strategy

Since its inception in the 1960s (Tinbergen 1962; Pöyhönen 1963), the gravity model of trade was traditionally estimated as a cross-sectional regression, but more recently is estimated using panel methods. In reviewing the trade effects of trade agreements, Limão (2016) notes three main issues with earlier gravity model estimates, namely (1) results drawn from small sample sizes (typically based on cross-sectional data); (2) the inclusion of atheoretical right-hand side variables (often in the quest to counter the omitted variables bias problem); and (3) sample selection (with a tendency to use positive trade values only).

Dealing with the first point is relatively straightforward: greater data availability has allowed larger panel datasets from which more reliable results can be drawn. Panel methods are also best placed to deal with the endogeneity of EIAs (Baltagi *et al.* 2017).

On the second point, three main approaches have been used to help counter the omission of trade cost variables that can differ across locations. First, cross-country variation in trade costs have been proxied by international differences in aggregate price indexes, for example, an exchange rate index, an export unit value index or the GDP deflator (Bergstrand 1989). Second, to account for all those factors that impede bilateral trade, Anderson and van Wincoop (2003) compute multilateral price terms capturing bilateral trade costs relative to all other trading partner countries. Third, drawing on the

¹¹ Although not yet officially ratified by all members, negotiations to establish the Tripartite FTA have been underway since 2008 and therefore, can be viewed as if implemented *de facto*, at least to some extent.

¹² Note that all EIA dummies take the value of one for international trade and are zero for internal trade.

gravity model specification by Mátyás (1997), Feenstra (2002) advocates the use of country fixed effects (for both the exporting and the importing countries) in preference to calculating complex price terms on the grounds that trade costs are often not directly observable or are difficult to measure.

In a panel context, a generalised gravity model specification with time-varying country fixed effects and time-invariant country-pair fixed effects has been advocated (Baltagi *et al.* 2003; Baldwin and Taglioni 2007). While the time-varying country fixed effects account for changes in (outward and inward) multilateral resistance over time, the time-invariant country-pair fixed effects allow for endogeneity of trade policy variables arising from unobserved bilateral heterogeneity (Baier and Bergstrand 2007).

On the third point, Helpman *et al.* (2008) have argued that gravity estimates based on positive bilateral trade flows (that exclude zero trade observations for countries that do not trade with each other) can lead to biased results. Therefore, estimating the gravity equation as a log-linear model is problematic because the logarithm of zero is undefined, implying the zero trade flows are simply dropped. Dropping the zero observations has few consequences for the industrialised economies, but is less desirable for analysing trade between developing countries where the number of zeros tends to be non-negligible (Longo and Sekkat 2004).

To deal with the issue of zeros, different approaches have been used: Tobit regression with the zero observations censored; Heckman's (1979) two-stage sample selection approach that corrects for possible bias; and the Poisson estimator (Haq *et al.* 2013). Santos Silva and Tenreyo (2006) advocate the last of these be used because the

Poisson pseudo maximum likelihood (PPML) estimator attains unbiased and consistent parameter estimates of the gravity model.

In short, estimating the gravity model of African trade determinants (equation 2) using the PPML estimator with three-way fixed effects draws on a combination of theoretical developments in relation to trade costs that give rise to international differences in prices (Anderson and van Wincoop 2003); the preferred use of PPML to deal with the issue of zeros and heteroscedasticity (Santos Silva and Tenreyro 2006); and three-way fixed effects (exporter-time, importer-time and country-pair fixed effects) to account for variation of multilateral price terms and endogeneity of EIAs (Baier and Bergstrand 2007).¹³

3. DATA

The panel dataset consists of bilateral trade comprising international and intra-national trade data, a set of time-invariant gravity variables and various EIA dummies, classified according to different types of agreements. International trade refers to bilateral manufacturing exports (bilateral manufacturing imports is also used as a separate dependent variable) in US dollar thousands¹⁴ from all African Union member states¹⁵ to

¹³ In this vein, a high-dimensional fixed effects estimation procedure has been developed to deal with computational issues associated with PPML and three-way fixed effects (Zylkin 2017; Correia *et al.* 2020).

¹⁴ Manufactured goods, defined according to the standard international trade classification (SITC), is the sum of four categories, namely SITC 5 (chemicals and related products), SITC 6 (manufactured goods), SITC 7 (machinery and transport equipment) and SITC 8 (miscellaneous manufactured articles) excluding two categories, SITC 667 (pearls, precious and semi-precious stones) and SITC 68 (non-ferrous metals).

¹⁵ Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, DR Congo, Côte d'Ivoire, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini (formerly known as Swaziland), Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, The Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe.

all countries in the world¹⁶ over the 1995-2020 period, sourced from *UNCTADStat*, United Nations Conference on Trade and Development (UNCTAD 2021).

Intra-national trade data are not typically available. Following the recent literature on constructing consistent data for international and intra-national trade flows (Yotov *et al.* 2016; Heid *et al.* 2021), intra-national trade is calculated as the difference between total manufacturing output (gross values) and total manufacturing exports, where the former is taken from *INDSTAT2* (Industrial Statistics Database at the 2-digit level), United Nations Industrial Development Organisation (UNIDO 2021) and the latter is bilateral manufacturing exports summed across all partner countries. By allowing consumers to choose among domestic and foreign varieties, the inclusion of intra-national (domestic) trade is justified on the grounds of consistency with gravity theory (Yotov *et al.* 2016).

The geographic distance between two capital cities (in kilometres) and the dummy variables for adjacent borders, common colonial histories and common ethnic languages¹⁷ are obtained from the *Centre d'études prospectives et d'informations internationales* (CEPII 2021).

The binary-coded EIA dummies, which take the value of unity if both countries are members of the same integration agreement and zero otherwise, are taken from Mario Larch's RTA database (Egger and Larch 2008), which compiles information for all trade agreements that have been notified to the WTO.

¹⁶ A comprehensive country coverage of bilateral manufacturing data for over 200 countries is available from UNCTADStat, albeit with missing data.

¹⁷ The ethnic language spoken by at least 9 per cent of a country's population is used to capture Africa's ethnic and linguistic diversity.

4. EMPIRICAL RESULTS

4.1 Trade effects of aggregated EIAs

Table 1 presents the estimated effects of aggregated EIAs (which combines all types of trade-related agreements into one dummy) on total African trade. Two separate dependent variables are used to capture the potential differing effects of EIAs according to the direction of trade, namely exports (that allow access to foreign markets with opportunities for economies of scale) and imports (that bring in goods, resources and technologies not otherwise available domestically). All regressions are run using the PPML estimator to control for zero trade flows and heteroscedasticity.

[Insert Table 1 here]

Columns (1) and (5) include the standard gravity variables (bilateral distance and the time-invariant dummies for an adjacent border, a common colonial history and a shared ethnic language) along with time-varying exporter and importer fixed effects to control for changes in multilateral resistance over time. The results are broadly in line with theoretical priors. As expected, greater distance reduces trade, but the higher magnitude for the exporting countries likely reflects the higher transport costs and time delays associated with Africa's poor quality and poorly integrated regional infrastructure – a direct consequence of centuries of colonial dominance (Foroutan and Pritchett 1993). Commonalities in the form of historic colonial linkages significantly and substantially increase exports and imports in similar proportions. Although colonial trade linkages have eroded after independence (Head *et al.* 2010), institutional proximity with the former European empires remains important. The effects of geographic proximity (adjacent land borders) and cultural linkages (ethnic languages) diverge depending on the

direction of trade, lifting it on the importing side, but lowering it on the exporting side. Mixed effects are also obtained for the covariate of interest, but the trade effects of EIAs are more reliable when generated using the full design of fixed effects.

Columns (2) and (6) additionally include country-pair fixed effects (which absorb the bilateral time-invariant gravity covariates) to control for endogeneity of EIAs. The results suggest striking differences in terms of the effects of EIAs depending on the direction of trade. On one side, EIAs exert a positive and significant effect on exports, suggesting developmental consequences of EIAs. On the other side, the neutral effect on the imports of manufacturing goods points to the ineffectiveness of EIAs for trade in an inwards direction.

Columns (3) and (7) include (5-year) lagged values of the EIA dummy to allow for trade adjustment as the provisions of newly formed trade agreements are implemented during the phasing-in period (Baier and Bergstrand 2007; Kohl 2014). The results reinforce the contemporaneous effects on trade: positive and significant for exports, neutral for imports (and even negative for the total EIA effect, defined as the sum of the contemporaneous and lagged effects).

Finally, columns (4) and (8) include (5-year) lead values of the EIA dummy as a test of endogeneity arising from reverse causality (Baier and Bergstrand 2007; Kohl 2014). Two countries are more likely to liberalise trade if trade linkages are already well-established or if there is potential for strong trade linkages in the future, implying the causality between trade and EIAs is not necessarily unidirectional. The non-significant lead variables indicate dual causality is not an issue. In summary, the overall EIA dummy

confirms the trade-enhancing effect of economic integration on exports only. Therefore, the rest of the analysis uses exports as the dependent variable.

4.2 Trade effects of disaggregated EIAs

Table 2 shows the overall trade effects and the breakdown of EIA effects by type of agreement (customs unions, FTAs and PSAs) across different groups of countries.

Columns (1) and (2) show the results for the subsample of African countries (ie intra-African trade). Columns (3) and (4) expand the subsample of African countries to include other developing countries (ie intra-developing country trade), where the group of member countries belonging to the Organisation for Economic Co-operation and Development (OECD) are dropped from the full sample of countries. In columns (5) and (6), the results for the full sample of countries are shown (ie total African trade with all countries in the world).

[Insert Table 2 here]

Although collectively economic integration significantly increases intra-African trade (column 1), the disaggregated results suggest that none of the economic integration types that are in force accrue trade benefits (column 2). In other words, the web of overlapping trade agreements in Africa have not delivered on their expected trade gains. This holds irrespective of the depth of economic integration, including the effects of the two monetary unions merged with the customs unions dummy, going against the findings of earlier studies that monetary policy harmonisation has stronger effects on trade (Rose 2000; Rose and Wincoop 2001; Carrère 2004), although consistent with more recent studies based on the structural gravity model with three-way fixed effects (Larch *et al.* 2019; Adu *et al.* 2022).

In terms of cross-regional integration, a similar story emerges for customs unions, not surprising because this type of arrangement is rarely agreed between disparate countries across different geographic regions. In contrast, FTAs with developing countries (column 4) and with all countries (column 6) are found to have the desired beneficial effects on trade. Tariff elimination matters for bilateral trade when membership includes bigger countries; when applied to a broad range of goods; and when the trade agreement is in force for a sufficient length of time to take effect.

Why might the FTA effect be smaller in magnitude for the full sample of countries? One possibility lies with the recent timing in the formation (and ongoing negotiation) of regional partnership agreements with the European Union. What is the outlook for EPAs? On the importing side, EPAs will progressively open African markets to the European Union (up to four-fifths of imports will become duty-free over the next two decades) with some sectors excluded. To offset losses of tariff revenues, other taxes will need to be generated – not straightforward for countries historically dependent on tariff revenues with limited alternative revenue raising capacity (McDonald and Walmsley 2008). On the exporting side, an overlap with existing trade arrangements (for example, the EBA initiative offering poorer countries duty-free and quota-free access to the European Union) erodes the value of preferential access (Perez and Njuguna Karingi 2007). The net effect is that European exporters are likely to be the biggest winners, thus raising the question of whether EPAs are good for African trade. In this context, Rekiso (2017) has highlighted the asymmetric nature of EPAs, which induce the continued specialisation in the export of primary commodities from Africa and the export of manufactured goods and services from the European Union. Moreover, the question of

whether EPAs are good for development depends on how well African manufacturers cope with European competition and whether cheaper imported machinery can boost African manufacturing.

PSAs are also found to increase trade, albeit with only a marginally significant effect for the group of developing countries. The effectiveness of PSAs tends to be limited by their nature: preferential trade concessions cover a pre-defined number of products only. More generally, the effectiveness of South-South agreements is limited by inter-industry specialisation, which offers little scope for the pro-competitive effects and variety gains of intra-industry trade associated with European integration (de Melo and Tsikata 2015).

4.3 Trade effects of AfCFTA and TFTA

Extending the analysis, Table 3 shows the effect on intra-African manufacturing trade of the continent-wide AfCFTA (merged with FTAs that are already in force) and similarly for the Tripartite FTA linking three major regional blocks in Africa. Note that to enable a comparison of the parameter estimates without the effects of AfCFTA and TFTA, the results shown in column (1), Table 3 replicate the results shown in column (2), Table 2.

[Insert Table 3 here]

Allowing for free trade between the three regional blocks that make up the Tripartite FTA (column 2) does not change the neutral effect of FTAs on intra-African trade (column 1). In line with their relatively low intra-regional trade shares, these results are consistent with previous findings that find negligible trade effects for COMESA and the SADC, notwithstanding a positive effect for the EAC reflecting greater liberalisation at a more advanced stage of the integration process (Riedel and Slany 2019). While the

TFTA includes some of Africa's larger countries (for example, Angola, Egypt, Kenya and South Africa), its potential positive effects are likely hindered by the exclusion of the Western African countries, most notably Nigeria. The effectiveness of the TFTA is also likely curtailed by barriers to trade that limit market integration.

In contrast, allowing for free trade between all African Union member countries introduces a positive and significant (and substantial) trade effect (column 3).¹⁸ In other words, AfCFTA delivers on its principal aim of increasing intra-African trade. Taken together, the findings suggest that a continent-wide FTA yields greater benefits when compared with integrating the subregions.

The results for AfCFTA corroborate previous findings of a strong positive effect emanating from a continental free trade area, for example, the computable general equilibrium (CGE) estimates by Abrego *et al.* (2019) suggesting that AfCFTA increases intra-African trade by 80 per cent. These estimates are on the high end of the spectrum in the context of other studies that have found more modest gains for intra-African trade stemming from AfCFTA, for example, the ex-ante evaluation of AfCFTA by Fofack *et al.* (2021) using aggregated trade data over the 1988 to 2012 period.

Given that the AfCFTA dummy is constructed using only 2 years of observations (2019 and 2020), it is possible that the point estimates are sensitive to the effects of the global pandemic. In 2020, the fallout from covid-19 brought about a dramatic drop in international trade (about 7 per cent) and even steeper declines in trade at a bilateral level,

¹⁸ In percentage terms, the effect of the combined FTA-AfCFTA dummy is 77 per cent, calculated as: $[\exp(0.57) - 1 \times 100]$.

but with much variation across the different trading partner countries (Nicita and Saygili 2021).¹⁹

To test whether the covid shock has induced differential effects of AfCFTA on intra-African trade, the AfCFTA dummy was reconstructed to take the value of one for the year 2019 only and separately to take the value of one for the year 2020 only.

Merging the AfCFTA dummies with the FTA dummy respectively and re-running the model yields similar effects (the coefficients for the joint FTA-AfCFTA dummy are 0.46 and 0.45 respectively), implying that the covid shock does not alter the effects of continental integration on intra-African trade.

The analysis comes with two main caveats. First, the estimated effects of African EIAs are based on a panel of reported trade data, which does not take account of (often high levels of) informal cross-border trade. Second, the effects of existing African EIAs are estimated ex-post, but there is also a case for evaluating the ex-ante effects of EIAs that are not yet in force (TFTA) or have recently come into force (AfCFTA). Predicting the potential effects of TFTA and AfCFTA on intra-African trade would involve generating counterfactual changes to trade in response to a hypothetical change in the EIA dummy using the properties of structural gravity and PPML within a general equilibrium framework. Data limitations, however, compromise the ability to generate counterfactual changes to trade for many African countries.²⁰

¹⁹ While the spread of the virus and lockdowns led to economic downturns all over the world, different capacities to deal with the economic, logistical and health challenges of the pandemic have contributed to different outcomes (Nicita and Saygili 2021). From a health perspective, Africa avoided the higher mortality rates typical of the advanced economies despite less advanced healthcare systems, partly reflecting its youthful and fast-growing population and lower life expectancy (Lawal 2021).

²⁰ Reasonably good data (positive or zero values) for intra-national manufacturing trade are available for only about a dozen African countries, but missing data for many African countries is problematic (many African countries have one or very few observations while several African countries have no data at all).

5. CONCLUSIONS

Using PPML with three-way fixed effects to estimate a panel of bilateral manufacturing trade comprising international and intra-national trade between the African Union member states and all countries in the world over the 1995-2020 period, the trade effects of African EIAs are assessed within the continent and beyond. The main results are summarised as follows.

First, in combining all types of trade-related agreements into one overall EIA dummy, the findings confirm the trade-enhancing effects of economic integration on total African exports, suggesting developmental consequences of EIAs. A neutral effect on total African imports is obtained.

Second, disaggregating the effects of EIAs by type of agreement and by subgroups of countries, FTAs and PSAs are found to have the desired beneficial effects on extra-African exports, albeit with only a marginally significant effect of PSAs for the group of developing countries. For intra-African exports, however, none of the economic integration types that are currently in force accrue trade benefits, suggesting that the web of overlapping trade agreements in Africa has not delivered on the expected trade gains.

To date, the effectiveness of African EIAs has been compromised by a mix of factors, including insufficient progress on reducing non-tariff barriers (NTBs) and making regional trade tariff-free (Yang and Gupta 2008). Indeed, trading costs are high not only because physical and administrative obstacles are rife, but also because new NTBs have been erected, for example, multiple interstate checkpoints, cumbersome customs procedures and unnecessary port delays. In addition, rules of origin governing where goods come from and which goods qualify for lower tariffs are different among

African EIAs (Yang and Gupta 2008). Naturally, more restrictive rules of origin increase verification checks at border crossings. At a cross-continental level, preferential trade concessions often cover only a limited number of products. High external trade barriers and potential tariff revenue losses from EIAs have also infringed on broader trade liberalisation.

Finally, expanding the FTA dummy to separately include free trade between the Tripartite FTA countries and free trade between all African countries respectively, AfCFTA is found to deliver on its primary objective of increasing intra-African trade in contrast to a neutral effect stemming from the joint FTA-TFTA dummy. The findings suggest that a continent-wide FTA yields greater benefits when compared with integrating the subregions.

In fully implementing the continent-wide FTA, AfCFTA should go a long way towards alleviating the major constraints to trade in Africa. First, extensive country coverage – AfCFTA’s membership of all African Union member countries – should help counter the issues arising under earlier phases of intra-African integration. In particular, transforming a lot of small-sized countries with weak domestic demand and fragmented markets (Njike 2021) into a larger unified market will provide opportunities for economies of scale, increased market efficiency and improved competitiveness.

Second, rebalancing specialisation away from commodity dependence in favour of greater diversification in the production and export of a broad range of intermediate and final products would be good for trade and growth alike (Portugal Perez and Wilson 2009; UNCTAD 2019). Developing regional value chains are important so that African firms can transform raw materials into value-added finished goods. In an age of

increasingly complex production processes, goods typically cross many borders where value is added from multiple countries of origin or, for vertically integrated production processes, goods cross borders multiple times at different stages of production (Fusacchia *et al.* 2022). In this context, well-defined and more flexible rules of origin are essential for shaping regional value chains and achieving trade liberalisation. Otherwise, restrictive rules of origin that offset preferential market access abroad can compromise supply chain decisions at home (Fusacchia *et al.* 2022).

Third, given that intra-regional import tariffs are relatively low, harmonising goods standards and licensing rules and, more generally, reducing NTBs and transport times are likely to yield bigger trade gains. Critical among the NTBs are customs and administrative requirements that directly affect a country's capacity to move merchandise beyond national borders (Abrego *et al.* 2020). In this vein, Freund and Rocha (2011) highlight the importance of trade facilitation measures, including reduced transit times and efficient documentation at customs and ports.

Fourth and linked to the previous point, more co-operation in devising regional infrastructure and connectivity is vital to enhance the trade benefits of African integration (Olney 2022). Improved port efficiency and greater intermodal transport linkages to enhance rural-urban ties and trade corridors can better connect Africa's interior with the rest of the continent – and with the rest of the world.

Last, economic integration is not just about economics; many African trade-related agreements include political objectives aimed at promoting democracy and preventing conflicts. A larger unified market can also bring diplomatic weight to the international stage

that adds voice, influence and bargaining power – all the more important as international powers increasingly vie for access to the continent's resources and potential markets.

Africa has a mixed record on freeing up trade. On one side, tariffs are falling in line with the plethora of African EIAs that have been put in place. On the other side, political opposition to free trade remains strong because of government concerns over potential tariff revenue losses and diminished control over industrial policy, the former particularly important in countries where the unemployment rate is high, the informal economy is large and taxes are hard to collect. When it comes to shaping trade policy, a clearer view has emerged: Africa increasingly looks away from the past and towards the future. Continental free trade offers a way to overcome the lingering effects of colonialism (Obeng-Odoom 2020). A united African market offers a way to make its future better.

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Table 1 Effects of aggregated EIAs on bilateral manufacturing trade (1995-2020)^{a, b}

	Exports				Imports			
	(1) PPML + FE × T	(2) PPML + Full FE	(3) Lags	(4) Leads	(5) PPML + FE × T	(6) PPML + Full FE	(7) Lags	(8) Leads
Distance (ln)	−1.77*** (−14.73)	—	—	—	−0.89*** (−5.84)	—	—	—
Adjacent border	−0.85*** (−2.91)	—	—	—	1.11*** (5.43)	—	—	—
Colony	0.90*** (3.27)	—	—	—	0.83*** (6.31)	—	—	—
Language	−0.01 (−0.05)	—	—	—	0.45*** (4.43)	—	—	—
EIA	−0.20 (−0.67)	0.21** (2.36)	0.03 (0.34)	—	0.54*** (3.47)	−0.11 (−1.42)	−0.17 (−1.26)	—
EIA (lag 5)	—	—	0.47*** (4.20)	—	—	—	−0.14 (−0.86)	—
EIA (lead 5)	—	—	—	−0.18 (−1.39)	—	—	—	−0.07 (−0.31)
Total EIA effect	—	—	0.50*** (4.15)	—	—	—	−0.31** (−1.99)	—
No. of clusters (exporters)	54	55	55	54	54	55	55	55
No. of clusters (importers)	217	221	221	221	217	221	221	221
No. of clusters (years)	26	26	21	21	26	26	21	21
No. of obs	135 691	135 762	119 143	101 134	122 668	122 453	98 980	98 624
Pseudo R^2	0.95	0.99	0.99	0.99	0.88	0.96	0.96	0.97

^a Poisson pseudo-maximum likelihood (PPML) estimates with exporter-time, importer-time and country-pair fixed effects (z-statistics in parentheses are multi-way clustered by exporter, importer and year). Note: the time-invariant gravity variables are explicitly included in columns (1) and (5); all other regressions include country-pair fixed effects.

* Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

Table 2 Effects of EIAs on bilateral manufacturing trade by subgroups of countries and by type of agreement (1995-2020)^a

	Intra-African trade		African trade with developing countries		African trade with all countries	
	(1) All EIA	(2) EIA types	(3) All EIAs	(4) EIA types	(5) All EIAs	(6) EIA types
All EIAs	0.42*** (3.87)	—	0.42*** (3.11)	—	0.21** (2.36)	—
Customs unions	—	0.06 (0.35)	—	0.44×10^{-2} (0.02)	—	0.36 (1.09)
Free trade agreements	—	0.32 (1.28)	—	0.58*** (3.20)	—	0.22** (2.03)
Partial scope agreements	—	0.25 (1.01)	—	0.55* (1.79)	—	0.51** (2.26)
No. of clusters (exporters)	55	55	55	55	55	55
No. of clusters (importers)	55	55	183	183	221	221
No. of clusters (years)	26	26	26	26	26	26
No. of obs	38 522	38 522	96 289	96 289	135 762	135 762
Pseudo R^2	0.99	0.99	0.99	0.99	0.99	0.99

^a Poisson pseudo-maximum likelihood (PPML) estimates with exporter-time, importer-time and country-pair fixed effects (z-statistics in parentheses are multi-way clustered by exporter, importer and year).

* Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

Table 3 AfCFTA and TFTA effects on intra-African manufacturing trade (1995-2020)^{a, b}

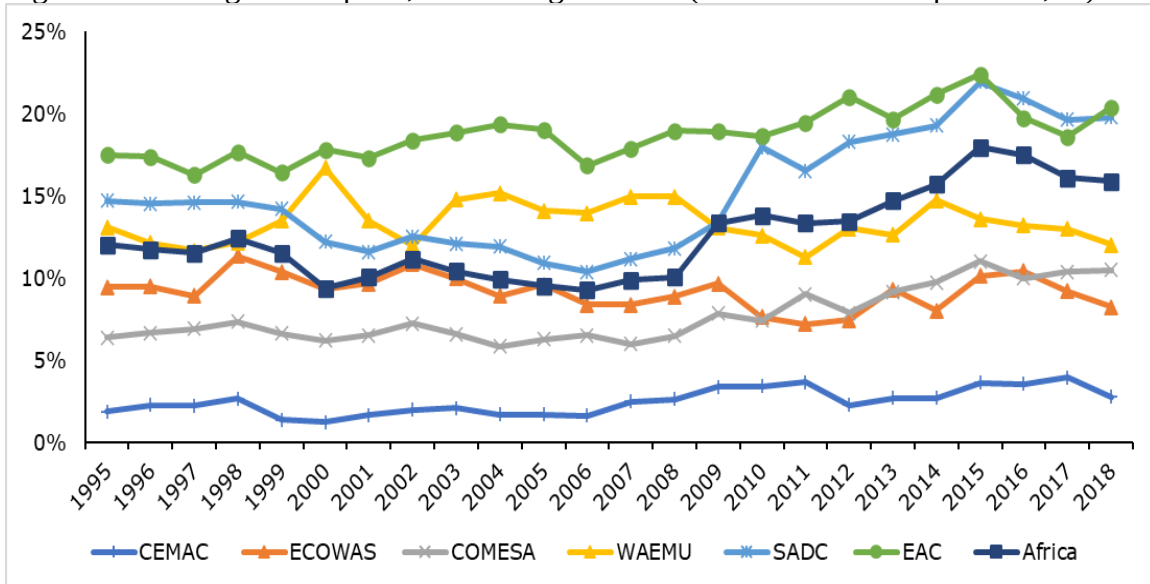
	(1) EIA types	(2) + Tripartite	(3) + AfCFTA
Customs unions	0.06 (0.35)	0.10 (0.58)	0.35×10 ⁻² (0.02)
Free trade agreements	0.32 (1.28)	0.32 (1.50)	0.57*** (3.20)
Partial scope agreements	0.25 (1.01)	0.27 (1.44)	0.07 (0.40)
No. of clusters (exporters)	55	55	55
No. of clusters (importers)	55	55	55
No. of clusters (years)	26	26	26
No. of obs	38 522	38 522	38 522
Pseudo R^2	0.99	0.99	0.99

^a Poisson pseudo-maximum likelihood (PPML) estimates with exporter-time, importer-time and country-pair fixed effects (z-statistics in parentheses are multi-way clustered by exporter, importer and year).

^b The FTA dummy (classified by the WTO and compiled in Mario Larch's RTA database; Egger and Larch, 2008) is expanded to additionally include free trade between the Tripartite FTA countries from the year 2008 onwards (column 2) and free trade between all African countries from the year 2019 onwards (column 3).

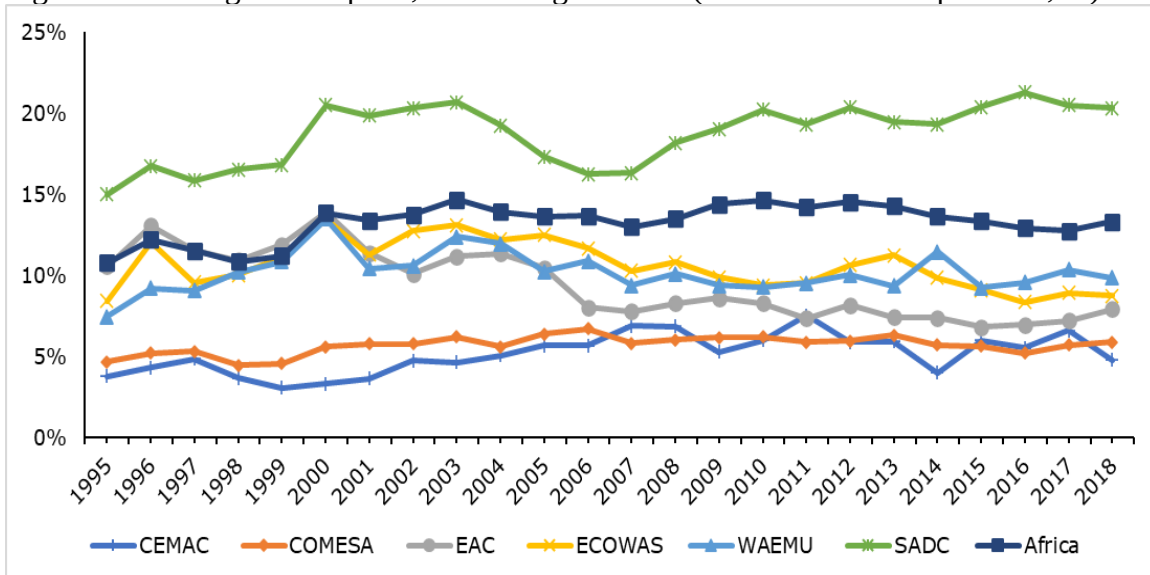
* Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

Figure 1 Intra-regional exports, selected agreements (total merchandise products, %)



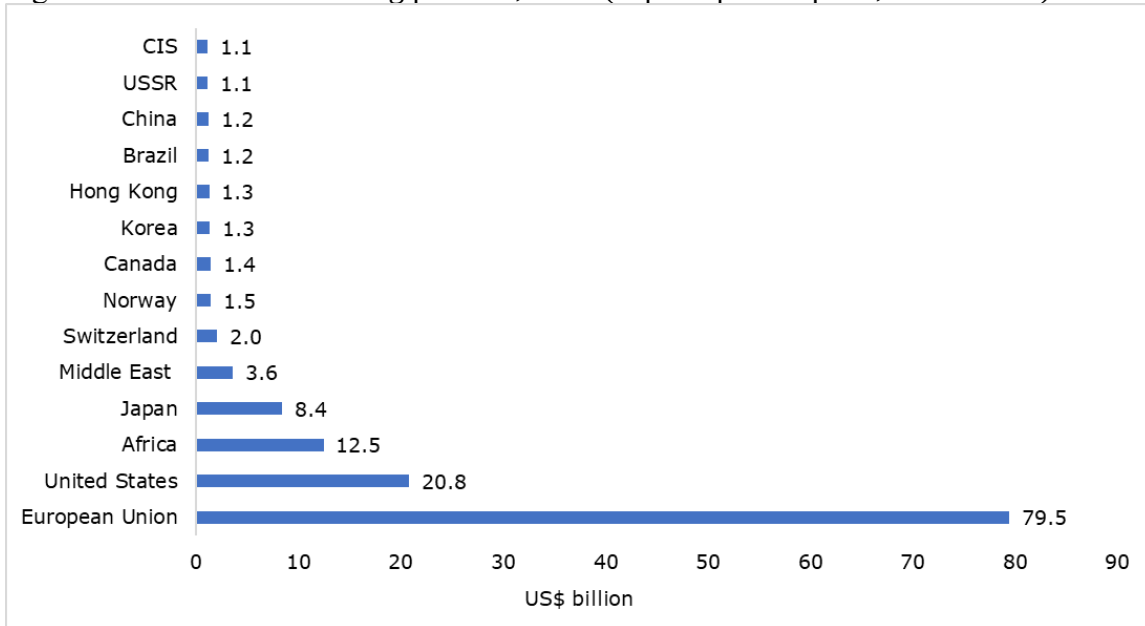
Source: UNCTADstat, UNCTAD.

Figure 2 Intra-regional imports, selected agreements (total merchandise products, %)



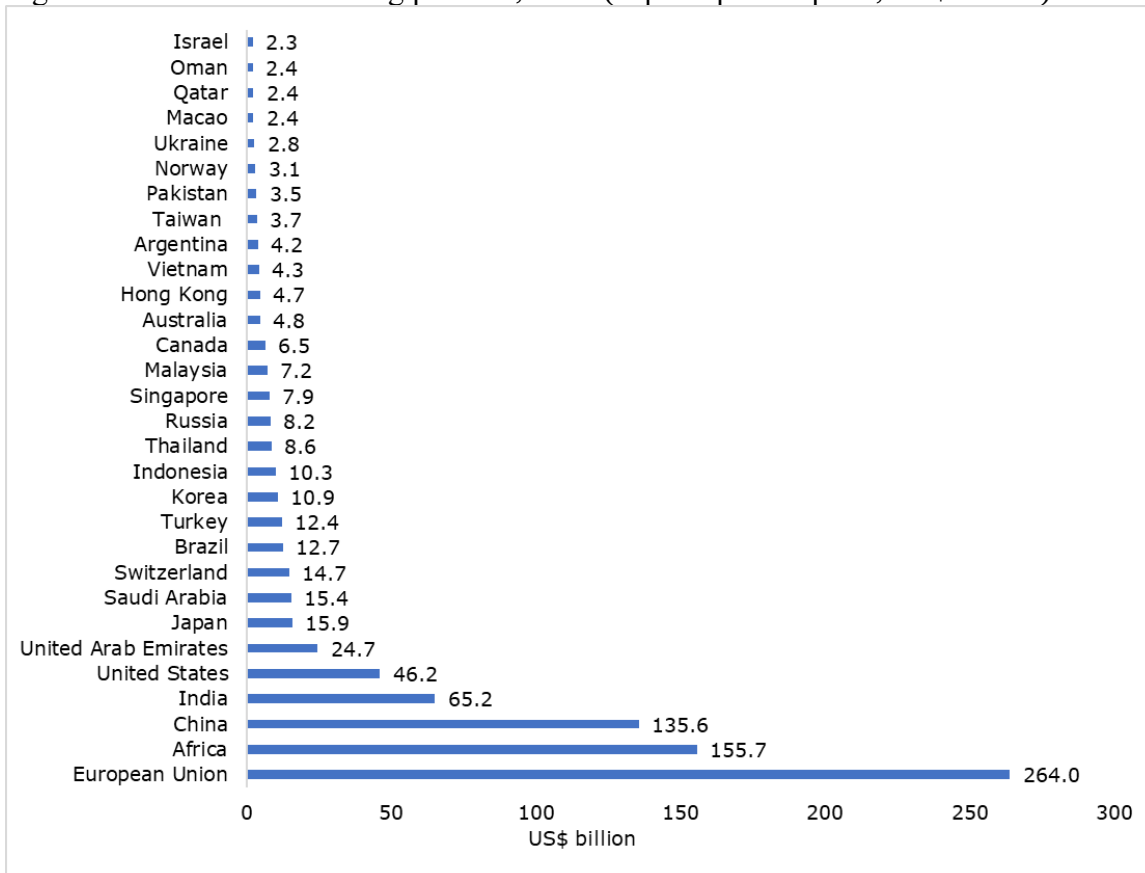
Source: UNCTADstat, UNCTAD.

Figure 3 Africa's main trading partners, 1990 (exports plus imports, US\$ billion)



Source: *Direction of Trade Statistics*, International Monetary Fund.

Figure 4 Africa's main trading partners, 2018 (exports plus imports, US\$ billion)



Source: *Direction of Trade Statistics*, International Monetary Fund.