Diversification and Intra-Industry Trade Effects of East African Community: The Case of Tanzania

Vincent Leyaro and Josephat Hongoli

Research Report 2022/12

Published for:
REPOA
157 Migombani/REPOA Streets, Regent Estate,
P.O. Box 33223
Dar es Salaam.

Suggested citation:
Leyaro, V., and Hongoli, J. (2022). Diversification and Intra-Industry Trade Effects of East African Community: The Case of Tanzania. REPOA, Dar es Salaam.

Research Report 2022/12

Suggested Keywords:
Inter and intra industry trade, custom union, single custom territory, Tanzania
JEL Classifications: H23, H53

This publication was produced with the financial support of the European Union, through the EU-ACP TradeCom II Programme, as part of the Targeted support to strengthen capacity of policymakers, exporters, and trade associations to assess and review trade and related economic policies to promote trade competitiveness and diversification for widening trading opportunities with the EU" project implemented by REPOA and ISS-Erasmus Its contents are the sole responsibility of the research team and do not necessarily reflect the views of the European Union, the EU-ACP TradeCom II Programme, REPOA or ISS-Erasmus. The Member States of the European Union have decided to link together their know-how, resources, and destinies. Together, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, tolerance, and individual freedoms. The European Union is committed to sharing its achievements and its values with countries and peoples beyond its borders.

Abstract

By expanding market size and lower trade costs, regional integration can enhance export diversification and competitiveness, that are important drivers of economic growth. Using disaggregated trade statistics at 6 HS code digits and applying Grubel-Lloyd Index (GLI), this study examines whether Tanzania's pattern of trade structure with its trading partners' in the EAC markets has transformed overtime, from more of inter-industry trade to more of intra-industry trade. The latter is a measure of Tanzania's export diversification and competitiveness in the EAC markets, which also is a better gauge for economic transformation (structural convergence) and regional integration value addition. We find that there has been a moderate improvement of intra-industry trade (ITT), mostly with Kenya and Uganda in the EAC markets, as IIT indices increased from about 2% in 2000 to 10.3% for Kenya and 8.7% for Uganda. Even though, this only gives indication of potential intra-industry trade in the future, as an indication for intra-industry trade requires a country to have an ITT greater than 33%. When we limit analysis only for Kenya and Uganda for the entire period, on average, the IIT index is nearly 5.5 % (Kenya about 6.5% and Uganda about 4.5%). As the IIT indices of Tanzania in most of EAC markets is less than 33% (preferably is required to be more than 50%), largely this is an indication that Tanzania trade in the EAC markets have significantly remains inter-industry, a further indication of lack of economic transformation (structural convergence), mainly reflecting lack of regional integration value chain. In addition, while the market size, regional integration and trade openness are found to promote intra-industry trade; geographical distances, exchange rate and economic disparity adversely affect ITT. Clearly, for Tanzania and its trading partner in the EAC to attain structural convergence (i.e. economic transformation) countries in the regional has to enhance regional integration value chain, that too can act as springboard into global value chain.

Table of Contents

Abstract iii

1. Introduction 1

2. Diversification and Intra-Industry Trade: A Review of Literature 5

3. Empirical Strategy and Data 8

3.1 Measuring Intra-Industry Trade: The Grubel-Lloyd Index 8

3.2 Estimation of Determinants of Export Diversification 10

3.3 Data Sources and Descriptive Statistics 11

4. East Africa Community and Tanzania Trade Performance 13

5. Export Diversification and Intra-Industry Trade: Discussion of Findings 22

6. Estimation Results 30

7. Conclusions and Implications 33

References 35

Appendices 37

Appendix A: Descriptivie Statistics 37

Appendix B: Intra-Industry Trade Index 39

Appendix C: Estimation Results 43

1. Introduction

Compelling theoretical grounds and empirical evidence today support the thesis that openness to trade advances export diversification and competitiveness. The argument goes that all countries should open up their borders and integrate all goods and all factor markets worldwide. More openness is (almost always) better than less, as only this can guarantee an efficient economy worldwide and improves people's welfare (*the first best solution)*. Asian countries, for instance, that pursued outward oriented strategies and export-led growth in 1960s and 1970s have achieved phenomenal growth rates and economic development.1 As exports of manufactured goods by most Asians countries have increased rapidly over the last 40 – 50 years, helping them make transition out of agriculture and lifting many out of poverty (Hertel and Martin, 2000; WB and WTO, 2015). Thus, by expanding trade and reducing export concentration, export diversification (and competitiveness) is widely recognized as an important driver of economic growth and structural transformation.

Even though, not all countries could open up their borders and integrate worldwide but only some neighboring countries could integrate regionally (*the second best strategy*). This has been the midwife of the theory of regional economic integration as developed by economists such as Jacob Viner (1950), James Meade (1955), Leopold Kohr (1960) and Richard Lipsey (1960; which is directed towards the politically feasible regional integration of nations in a close geographic proximity and not towards a welfare improving worldwide integration. While by dismantling tariffs barriers to trade (i.e. removal of boarder measures) regional integration such as a custom union could lead to static effects; nations that are forming a custom union that addresses non-tariffs barriers to trade (i.e. behind-the-border impediments) are likely to receive dynamic effects on the rate of output growth of a country. This could range from

[1]African and most Latin America countries, that initially followed import substitution strategies and implemented trade liberalization and export-led growth policies only since the 1980s, have continued to trail behind, in both growth and trade terms.

technology transfer and diffusion through trade and FDI; to pro-competitive gains from increasing import competition in imperfect competition, greater exploitation of economies of scale in production, and the greater use of intermediate inputs, amongst others.[2] Studies have shown that the gains from a successful process of removing behind-the-border measures could be considerably higher than the losses which may arise from removing behind-the-border measures (as they lead to deeper market integration) (Gonzalez and Cirera 2012).

Consequently, the formation of a regional integration bloc that develops into a customs union and thereafter a single customs territory such as the European Economic Community (EEC) and in our case the East African Community (EAC) Custom Union (ECA-CU) and EAC Single Custom Territory (ECA-SCT) (i.e. moving from shallow integration into deep integration) is expected to significantly expand the market in terms of population size and GDP per capita (or GNI) in the one hand[3] and significantly lower trade costs on the other hand[4] allowing firms to take advantage of consumers' desire for variety and economies of scale to expand production and so exports. As a result, more firms will enter the market and compete in producing similar but slightly differentiated products. This affects the number of products each firm produces and technology transfer across countries, enhancing competition and export diversification. This process alters the trade pattern structure from inter-industry trade to intra-industry trade and increases trade volumes (sign of improved term of trade and trade performance); an indicator for value addition and economic transformation.

[2]Others include increased geographical dispersion of production through trade that supports the exploitation of different factor proportions for different parts of the production process; local economies of scale through finer specialization and division of labour in production; and externalities arising from institutional changes that lead to wide increases in productivity.

[3] That is, the size effect: larger producers will export more to all destinations, big/rich markets will import more from all sources, and trade flows between countries *i* and *j* will be larger the more similar in the size the trading partners are.

[4] That is, the trade cost effect, which captures the total effects of trade costs that drive a wedge between realized and frictionless trade.

Thus, one major measure of the effects of forming a customs union and a single customs territory among member countries on trade performance is the calculation of intra-industry trade (IIT) indices as a measure of export diversification (and competitiveness).

Within this context, African countries have embraced regional integration as an important component of their growth and development strategies since the early 20th century. Africa's long history of regional integration initiatives dates back to the South African Customs Union (SACU) establishment in 1910. Kenya and Uganda first formed a customs union in 1917, which Tanganyika joined in 1927, and the first EAC was formed in 1967 (Alemayehu and Kibret 2002; Jenkins 2000). Since then, a number of regional economic communities (RECs) have been formed across the continent, even though most of them have performed poorly in comparison with the EEC. In East Africa, from a Permanent Tripartite Commission for East African Cooperation that was tasked with reviving regional cooperation in 1993, hence the establishment of East African Cooperation in 1996, to the Treaty for the establishment of the EAC in 2000, the Protocols for the establishment of EAC-CU in 2005, EAC Common Market (EAC-CM) in 2010 and a single custom territory in 2014, EAC integration process have come a long way. In 2013 the block signed the protocol for the establishment of EAC Monetary Union (EAC-MU) and the Partners States are aspiring to form a Political Federation in the future.

As regional integration has intensified in the EAC, interests in the link between the formation of EAC-CU and a single customs territory (ECA-SCT) on trade performance in terms of export diversification and competitiveness, among other realized benefits of a customs union, have intensified. The main research question being asked is whether the formation of EAC-CU and a single custom territory for the past two decades have enhanced export diversification and competitiveness of Tanzania products in the EAC markets? Specifically using IIT measures, this study explored in which product/markets intra-industry trade have increased. These provide more

interesting policy relevant analysis as it helped providing useful information to know which products are increasing/losing intra-EAC shares.

Making use of disaggregated trade statistics at 6 HS Code digits and applying Grubel-Lloyd Index (GLI), this study examines and assess whether Tanzania's trade patterns (and for that case trade structure) with its Partner States has changed and improved overtime from more of inter-industry trade (trade in dissimilar products) to more of intra-industry trade (trade in similar but slightly differentiated products) as a measure of its export diversification and competitiveness in the EAC markets. In so doing we start by tracking the evolution of trade flows in the run-up to the custom union (2001 to 2005) as to describe how patterns of specialization have evolved in Tanzania thereafter (2005 to 2021); that allow for the introduction of a single custom union in 2014. Furthermore, attempt has been done to try to explain what could be the determinants of Tanzania's export diversification and competitiveness in the EAC markets.

2. Diversification and Intra-Industry Trade: A Review of Literature

The desire to understand and explain what determines trade patterns (flow), either bilateral or multilateral, is at the heart of any trade theory. Following David Ricardo's formulation of a law of comparative advantage in 1871 (whereby gains from trade are due to differences in technology) and the Heckscher-Ohlin model of factor endowment in 1933 (where gains from trade are due to differences in factor endowment), up until the 1970s everyone was convinced that trade flow can be explained only by differences in comparative advantage across countries. This trade theory is referred to as traditional (classical) trade theory and is based on perfect competitive models and constant returns to scale, taking the country as the unit of analysis and assuming that, since trade exists due to differences in comparative advantage, flow is due to inter-industry trade (i.e. trade-in dissimilar goods between countries). In these trade models, individual firms within a country are atomic and negligible (Feenstra, 2004).

While up until the 1970s, the traditional trade theories did well in explaining why countries trade, with time they became less relevant in explaining modern trade flow. From the late 1970s and early 1980s, economists such as Krugman, Helpman, and Brander started to observe that there is more trade between countries that are similar in everything (technology, factor endowment, tastes), than between countries that are dissimilar (more than 80 percent of global trade is among countries that are similar). Hence, it was impossible to reconcile modern trade patterns with the traditional trade models, where countries trade because they are different. This led to a new trade theory based on an imperfect competition model and increasing returns to scale, where a beneficial (gainful) trade can exist even if countries are identical. Such a trade pattern is referred to as intra-industry trade (trade-in similar but slightly differentiated

products), as opposed to the inter-industry trade pattern of classical trade models (trade-in dissimilar products) (Helpman and Krugman 1985).

In his 1979 article, Krugman formalized the idea that economies of scale together with imperfect competition can give rise to trade even in the absence of comparative advantage, due to (i) people's desire for variety, which allows firms to specialize in the production of similar but slightly differentiated products (also referred as product differentiation), and (ii) increasing returns to scale due to economies of scale; both of which lead to intra-industry trade. He pioneered the incorporation of increasing returns to scale and product differentiation into trade models. With this, we trade in similar but slightly differentiated products between countries due to identical factors, technology, or preference (Krugman 1979, 1980).

Therefore, the formation of a regional integration bloc that develops into a customs union and thereafter a single customs territory such as the EEC and in our case the ECA-CU and ECA-SCT (i.e. moving from shallow integration into deep integration) will significantly expand the market in terms of population size and GDP per capita (or GNI) on the one hand[5] and significantly lower trade costs on the other hand[6] allowing firms to take advantage of consumers' desire for variety and economies of scale to expand production and so exports. As a result, more firms will enter the market and compete in producing similar but slightly differentiated products. This affects the number of products each firm produces and technology transfer across countries, enhancing competition and export diversification. This process alters the trade pattern structure from inter-industry trade to intra-industry trade and increases trade volumes (exports and imports); indicator for an improved term of trade and trade performance. Thus, one major measure of the effects of forming a custom union and a single customs

[5] That is, the size effect: larger producers will export more to all destinations, big/rich markets will import more from all sources, and trade flows between countries *i* and *j* will be larger the more similar in the size the trading partners are.

[6] That is, the trade cost effect, which captures the total effects of trade costs that drive a wedge between realized and frictionless trade.

territory among member states on trade performance is the calculation and estimation of both export diversification and intra-industry trade (IIT) indices.

Thus, a measure of the scope for *deep market integration* can be found in the level and evolution of intra-industry trade; which tends to occur in markets that are characterized by imperfect competition (i.e. product differentiation) and economies of scale (increasing returns to scale). Firms operating in such markets compete by producing differentiated products of varying quality, exploiting market dominance and economies of scale to attain higher profit margins. The extent of IIT is important since it captures the incidence of firms' cross-hauling different varieties of products where domestic value added is likely to be larger. For instance, the process of *deeper* European Union (EU) integration,[7] through the creation of the single market, is credited as the precursor of *niche specialization*. Furthermore, intra-industry trade can also point towards value chain activity where countries import components for domestic processing and subsequently export the resulting product. This type of activity has recently been linked with higher international technological diffusion as well as higher rates of productivity. It results in a finer specialization along with international rather than national comparative advantages and can yield significant economy-wide benefits.

[7]One of the key outcomes of the process of EU integration was that, instead of resulting in the polarization of economic activity; where Germany specializes in the production of cars, and France in that of wine, it resulted in patterns of specialization where each country produced different varieties of cars and wine.

3. Empirical Strategy and Data

3.1 Measuring Intra-Industry Trade: The Grubel-Lloyd Index

Intra-industry trade arises if a country simultaneously imports and exports similar types of goods or services, where goods or services are classified in the same 'sector', can be traced back to the empirical findings of Pieter Verdoorn and Bela Balassa (1966). Herbert Grubel and Peter Lloyd (1975) provided the definitive empirical study on the importance of intra-industry trade and how to measure it. Both of these studies estimated the increased trade flows due to the increased economic integration of Western Europe in the late 1950s and early 1960s. Their findings were surprising because trade expansion was primarily intra-industry rather than inter-industry for manufactured goods. The expansion of European intra-industry trade was contrary to traditional neoclassical trade theory, which explains trade patterns resulting from differences in technology and factor endowments among trading partners, hence inter-industry trade (trade in dissimilar goods and services).

The expansion of intra-industry relative to inter-industry trade in Europe provided the catalyst for developing a strand theory in the international trade literature that has come to be known as the 'new trade theory. The theoretical underpinnings of this literature are based on monopolistic competition, product differentiation, economies of scale in production, consumer demand for variety, and similarity in consumer preferences. Solid theoretical foundations for explaining intra-industry trade came later (in the 1980s and 1990s) with the new trade literature, based mainly on a monopolistic competition framework. There are thus two different types of intra-industry trade, each warranting a different type of explanation, namely *horizontal intra-industry trade*; this refers to the simultaneous exports and imports of goods classified in the same sector and at the *same stage of processing*. And v*ertical intra-industry trade*; refers to the simultaneous exports and imports of goods classified in the same sector but at *different stages of processing*.

While there are different ways of measuring intra-industry trade (IIT), for example, the Balassa Index in 1964, the Aquino Index in 1978 and the Bergstrand Index in 1983; in the empirical literature on intra-industry trade, the most often used method for determining the extent of intra-industry trade is as proposed by Grubel and Lloyd (1975) – hence GLI index; which is simple to calculate and intuitively appealing. Sharma (1999), Kol and Mennes (1985) have convincingly demonstrated that as far as measuring trade overlap is concerned, the GLI is to be preferred. Once a country's export and import value for a particular sector and period are known, in its simple form, the share of intra-industry trade between country *j* and *k*, over all industries is given by:

$$\mathbf{IIT}_{\mathbf{jk}} = \frac{2\sum_{i} \min\left(X_{ijk}, M_{ijk}\right)}{\sum_{i} \left(X_{ijk} + M_{ijk}\right)} \qquad (1)$$

where i is industry and j and k are countries. X_{ijk} are exports of industry *i* from country *j* to country *k*. Another way to calculate GLI is given as

$$\mathbf{IIT}_{\mathbf{ijk}} = 1 - \frac{\left|X_{ijk} - M_{ijk}\right|}{\left(X_{ijk} + M_{ijk}\right)} \qquad (2)$$

This index is bounded between 0 and 1, where the greater the magnitude of the index the more is intra-industry trade between countries, while less magnitude implies more of inter-industry trade or none trade. Helpman (1987) showed that the bilateral trade volume shares of intra-industry trade increases as two countries become more similar in factor composition. The implication of GLI depends very much on the level of aggregation of sectors or products and how one defines intra-industry trade. For the calculation to return good results that make sense it is advisable to use highly disaggregated trade statistics as highly aggregated trade statistics can be misleading. The level of aggregation is very critical in interpretation of this index.

3.2 Estimation of Determinants of Export Diversification

Borrowing from other previous studies, we also estimate the following fixed effect model to assess the potential drivers of the intra-industry trade:

$$T_{ijkt} = X'\theta + \gamma_t + \omega_k + \varepsilon_{ijkt} \quad (3)$$

where T_{ijt} is the average intra-industry trade (IIT) index between country i (=Tanzania) and country j (=Kenya, Uganda, Rwanda and Burundi) of product k (HS code) in year t. X is a vector of potential determinants of intra-industry trade. γ_t and ω_k are the years and sector fixed effect accounting for any unobservable year and products (6 digit HS code) specific factors attributable to products k (such as production technology and resources abundances), and ϵ is the mean zero error term. Following several other empirical studies, we include various potential determinants of intra-industry trade. These include the partner's state gross domestic product (GDP) as a measure of the relative market size and per capita income to measure the standard of living. Other previous studies suggest that the high the economic disparity between trading partners, the lower the intra-industry trade. To account for the economic disparities, we compute the normalized difference in GDP as a reasonable measure of the differences in market size between countries i and j. We compute the economic disparity index using the following formula:

$$ecodisp_{ijt} = 1 + \frac{wlnw + (1-w)\ln(1-w)}{ln2} \quad (4)$$

where $ecodisp_{ijt}$ is the economic disparity index between country i and j in year t and w is the ratio of country i output (GDP) to the sum of the output of country i and j ($w = \frac{GDP_i}{GDP_i + GDP_j}$). As for sensitivity, we also use the difference in per capita income to measure economic disparities. The other potential determinants widely explored and included in our analysis include the trading partner's geographical distance and trade openness. We include dummies for custom union and single custom territory to estimate the effects of economic integration with other EAC member states.

3.3 Data Sources and Descriptive Statistics

As mentioned above, intra-industry trade can be considered a classification problem as different types of goods and services are lumped together in the same sector. In practice, international trade flows are classified in various ways. As Grubel-Lloyd Index uses highly disaggregate trade statistics, we use trade statistics at 6-digits level Harmonized System (HS code); using combined trade statistic data from the TRADE MAP (www.trademap.org) for the period 2001 to 2021. We complement the data with UNIDO's industrial statistics at the 4-digit ISIC code level and the UN COMTRADE data, which has up to 6-digit product-level data on exports and imports. Table 1 presents some descriptive statistics of key variables of interest for Tanzania trade data from 2001 to 2021. We also utilize data from CEPII, which compile macroeconomic data for gravity estimation for the determinants of intra-industry trade (not presented on summary statistics).

Table 1: Descriptive Statistics

	Mean	SD	Min	Max
Exports:				
Value- *EAC*	422.76	293.52	52.03	1152.21
Products- *EAC*	886.62	236.22	440.00	1275.00
Value- *ROW*	3194.26	1570.96	716.27	5238.60
Products- *ROW*	1500.43	366.89	644.00	1862.00
Value- *TOTAL*	3617.02	1830.47	768.30	6390.81
Products- *TOTAL*	1780.24	394.15	872.00	2167.00
Imports:				
Value- *EAC*	309.28	171.71	98.95	706.42
Products- *EAC*	1420.95	286.98	908.00	1811.00
Value- *ROW*	7292.04	3756.84	1592.17	14427.26
Products- *ROW*	1500.43	366.89	644.00	1862.00
Value- *TOTAL*	7601.32	3886.65	1691.12	14705.92
Products- *TOTAL*	3943.57	67.40	3803.00	4068.00
Intra-trade:				
Products-*EAC*	486.05	158.85	195.00	826.00
Products-*ROW*	1339.90	382.39	464.00	1701.00

Products-*TOTAL*	1596.24	408.38	655.00	2032.00

Notes: All values are in Millions of USD. Export and import products are a number of HS code6 items exported and imported, respectively. Intra-trade products are the number at HS code 6 with positive values for exports and imports. *EAC*-East Africa Community and *ROW*-Rest of the World.

Data source: ITC Trade Map Data

As shown in Table 1, for the past two decades (2001 – 2021), the value of Tanzania exports to EAC has been nearly eight times lower than the RoW, as it accounted for only 12% of the total value of exports. The number of exported products at 6 HS code has been at about 887 during this period, equivalent to 59% or 49% of exported products to the RoW and total exports, respectively. At the same time, while the value of exports (USD 423 million) to EAC is higher than the imports (USD 309.3 million, on average) from EAC, still imports from EAC are significantly lower compared to those from RoW, as on average it accounted to about 5% of the total value of imports. On average, Tanzania's trade-in EAC markets have relatively remained low, at 12% for exports and 4% of its imports during this period

4. East Africa Community and Tanzania Trade Performance

As alluded earlier, the formation of East Africa Community in 2000 that has progressed into a Custom Union in 2005 and thereafter into a single custom territory in 2014 is expected to increase the market size in terms of population size and expenditure (i.e. GDP/GNI) for Tanzania exports in the one hand and lower trade costs for Tanzania trade in the other hand in the EAC markets. This will allow firms from Tanzania to take advantage of the market opportunities in the form of more firms entering and competing in the EAC market (to produce similar but slightly differentiated products) and economies of scale (due to increasing return to scale). As a result, this will increase export diversification (number of Tanzania products/firms in the EAC markets) and competitiveness (as firms compete for the space in the EAC markets), both of which are expected to increase the trade (exports) volume.

We start the discussion of the preliminary findings of this study first by tracking the trade patterns between Tanzania and its trading partners in the EAC markets from 2001 to 2021. Then we turn the discussion into how forming an EAC custom union and single customs territory have enhanced export diversification and competitiveness in terms of intra-industry trade.

As shown in Appendix TableA1 and Figure 1, Tanzania exports into EAC markets as the share of its total exports have increased substantially, from about 6% in 2000s to about 10% in 2005 and jumped further to 15 % in 2015 and to 18 % in 2021. On the other hand, while it has been increasing in value, the share of total imports from EAC markets has been declining over time; as it fell from about 6 % in early 2001 to about 1.9 % in 2007 and 2015, before rose slightly to 4.8 in 2021. Over the entire period (2001 to 2021), on average, Tanzania exports into EAC markets accounted to about 11% of its total exports while the imports accounted only to about 4% of its total imports (the total trade to EAC markets accounted only about 6% of its total trade during this

period). This implies that a significant chunk of Tanzania trade is with countries outside EAC, that is with the Rest of World (about 90% of it exports and 95% of imports).

Figure 1: Tanzania trade volume and share with EAC and RoW

Notes: The top (left and right) plot shows the trade volume (value of exports and imports in mil. USD), and the bottom plot shows the trade share (export and import) over total trade with EAC and the rest of the world (ROW).

Source*:* Author's Compilation based on ITC Trade Map Data

We further decompose the trade patterns with each Partner State in EAC markets, as shown in Table 2 and Figure 2. Although declining in share, Kenya has continued to be the leading trading partner for Tanzania in the EAC markets. On average, exports to

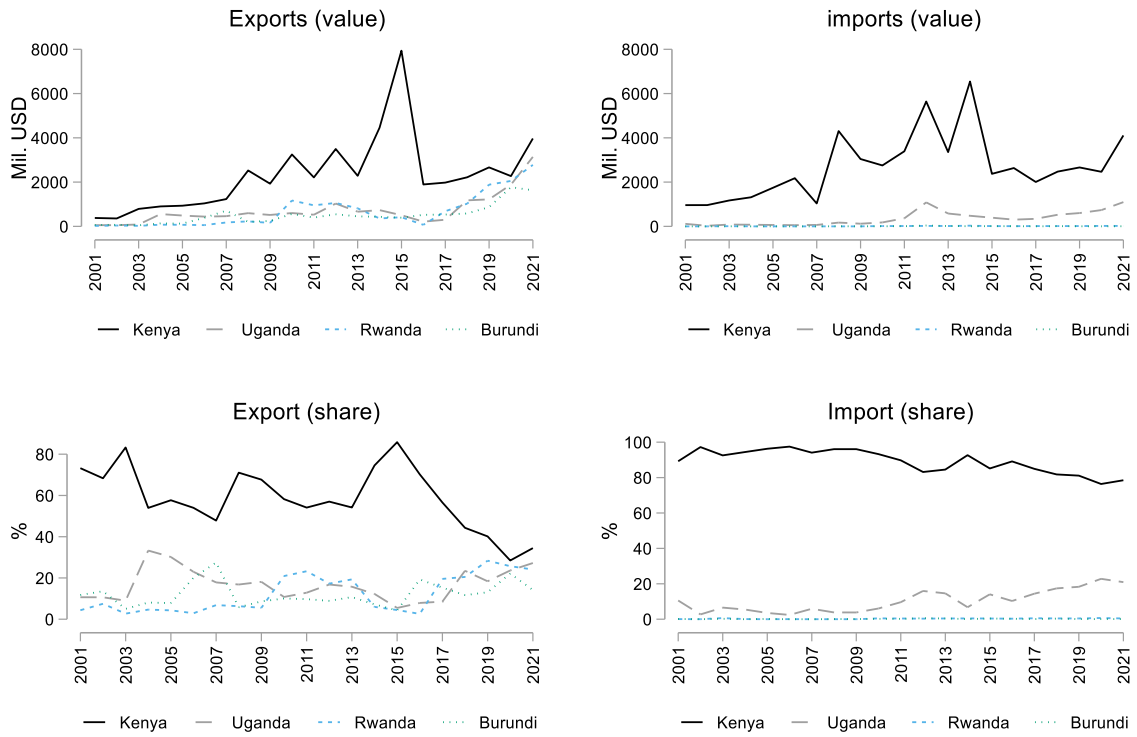
Kenya account for about 60% of all exports (falling from 73% in 2001 to 58% in 2010 before picking to 86 in 2015 and further slide to 34.5% in 2021) and 90 % of all imports from EAC markets. The share of exports to Uganda has remained at about 16% on average, and the import share, though rising, has remained at about 5% on average for the entire period/ Tanzania's exports share to Rwanda and Burundi over the entire period has been rising. On average, accounting to about 12% for each, while the imports accounted only to about 0.3% for Rwanda and 0.2% for Burundi. Thus, Kenya has remained a significant trade partner for exports and imports in EAC markets. However, the trade patterns have been very erratic, with significant changes every few years, suggesting that exports to and imports from the Partner States in EAC markets have been driven by a business cycle of demand and climatic weather change.

Table 2: Tanzania Share of Exports and Imports to the EAC Partner States: 2001-2021

	Kenya	Uganda	Rwanda	Burundi
Panel A: Export share				
2001-2005	67.302	18.752	4.703	9.243
2006-2010	59.760	17.315	8.506	14.419
2011-2015	65.143	12.633	14.060	8.164
2016-2021	45.713	18.197	20.142	15.948
Panel B: Import share				
2001-2005	93.939	5.770	0.172	0.119
2006-2010	95.393	4.407	0.115	0.084
2011-2015	87.053	12.214	0.401	0.332
2016-2021	81.982	17.374	0.477	0.168

***Source**:* Author's compilation based on ITC Trade Map Data

Figure 2: Tanzania Export and Import Share with the EAC Partner States, 2001 – 2021

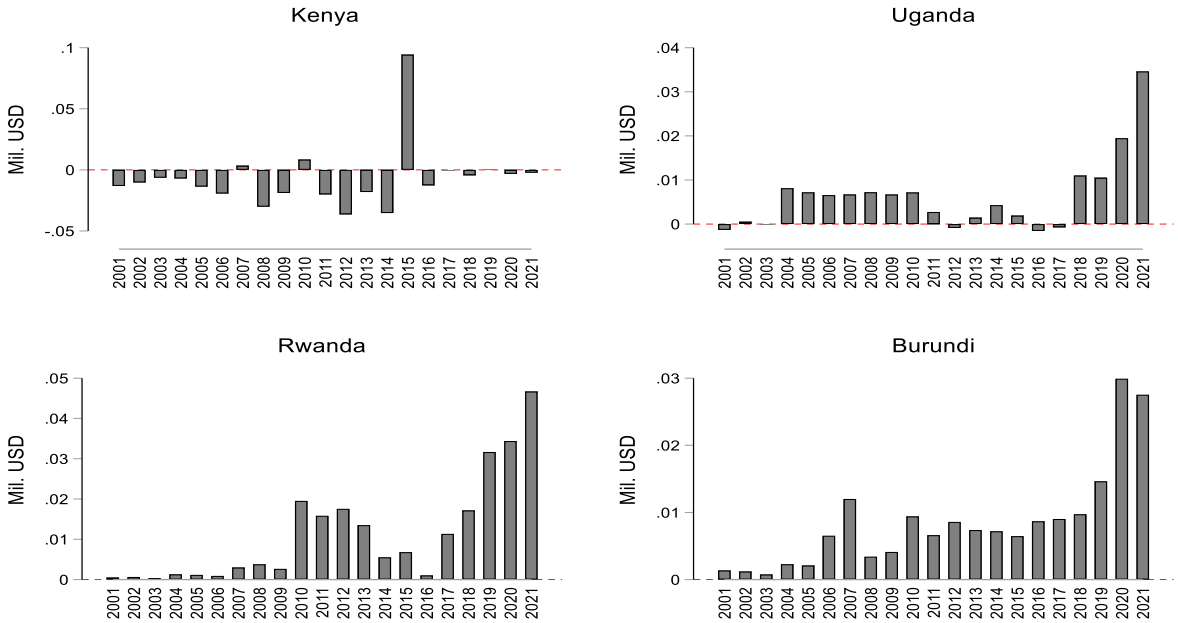


Notes: the top plot shows the trend in export and import value to and from all the EAC partner states, and the plots at the bottom show the export and import share of overall exports and imports from the EAC states.

Source: Author's Compilation based on ITC Trade Map Data

While trade imbalances between Kenya and Tanzania have somewhat improved more recently since 2015, as shown in Figure 3, there is still a trade deficit between Tanzania and Kenya albeit marginally small (except for a couple of years in 2007, 2010 and 2015 when we had a trade surplus). However, Tanzania maintained a significant trade surplus with the other countries in EAC, and much more significantly with Rwanda and Burundi.

Figure 3: Trade Balance for Traded Goods



Notes: The plots show the trend in Tanzania's trade balance with all EAC partner states from 2001 to 2020.

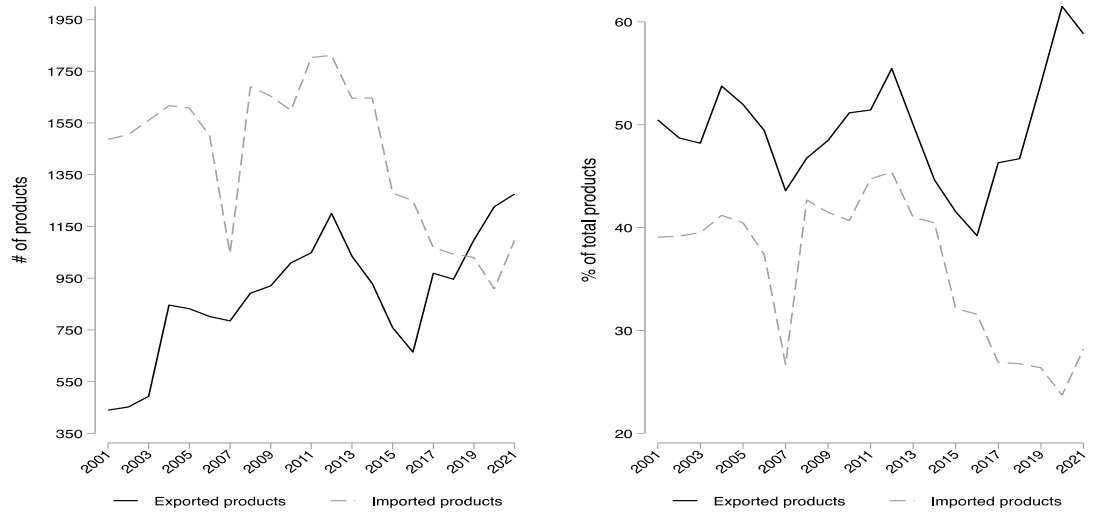
Source: Author's Compilation based on ITC Trade Map Data Source: ITC Trade Map

We further decompose the data into what type of products Tanzania is trading in the EAC markets to preliminary establish whether the pattern of trade structure has changed over time, from inter – industry traded products to intra – industry traded products.

Figure 4 presents a number of exported products to the EAC markets at 6-digits HS code and the share of total number of exported products. As shown, the number of exported products has increased from about 440 products in 2001 (i.e. about 50% of total number of exported products) to 1009 products in 2010 (about 51% of total number exported products), which is an equivalent to 129% increase; and further increased to 1,275 products in 2021(i.e. about 58 % of total number of exported products) an equivalent to 190% increase. Overall, for the entire period EAC markets have been accounting about 50% of total number of exported products. Even though, there has been sharp decline in total number of exported products from 1200 products

in 2012 to 664 in 2016 (an equivalent of 44.7% decline); and thereafter it picked up, surpassing the number of imported products in EAC markets since 2019 where Tanzania has been exporting more than what it importing. Though declining, EAC markets have been accounting about 36% on average of the total number of imported products.

Figure 4: Number and share of exported goods to all EAC States by 6-digits HS CODE



Notes: The left figure reports the the number of products (in 6-digits HS code) with positive exports or imports value for specific year and the right figure report the share (in %) of the products over total exported or imported products (from EAC and RoW).

Source: Author's Compilation based on ITC Trade Map Data

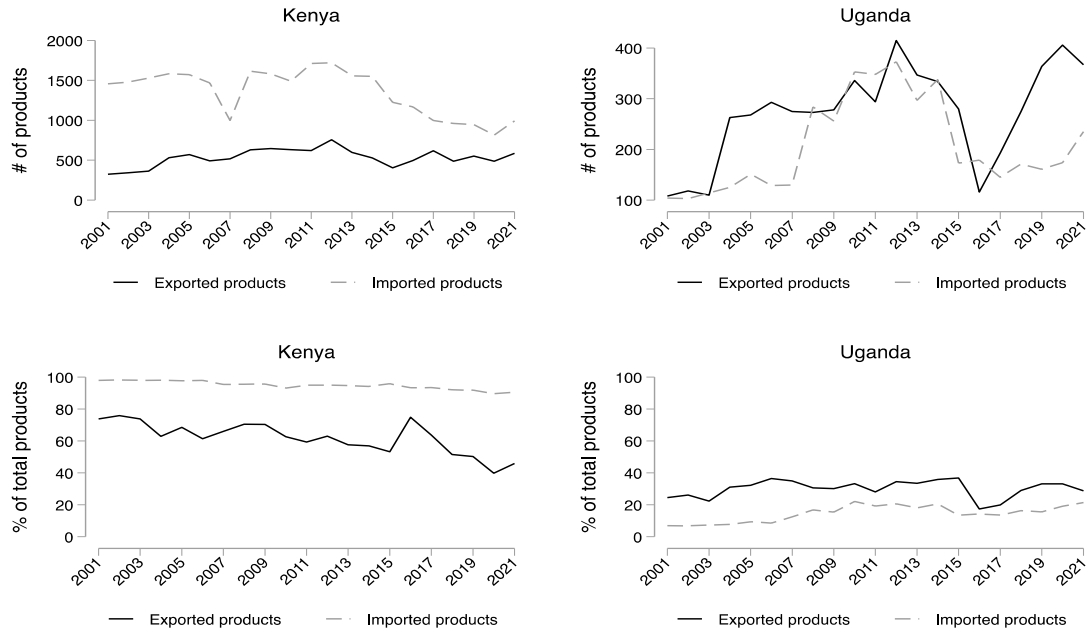
As shown in Figure 5, the larger number of traded products are with Kenya, as on average for the entire period, Kenya accounted to about 62 % of all exported products and 95% of all imported products in the EAC markets (the detail for how the ratio has been imputed is in the footnote). [8] This is followed by Uganda where in average the

[8] $Z\omega_{j,t} = \frac{\sum_k^K 1(Z_{k,j,t}>0)}{\sum_k^K 1\{(x_{k,j,t}+m_{k,j,t})>0\}}$ where Z={x.m}, x-export and m-import and $1(Z_k > 0)$ is an indictor function for product k with positive trade values and thus $\sum_k^K 1(Z_{k,j,t} > 0)$ is the sum of all exported or imported products at 6-digits of HS code from country j in year t. The denominator $\sum_k^K 1\{(x_{k,j,t} + m_{k,j,t}) > 0\}$ is the sum of all traded goods, with positive trade values either positive export or import value or both in year t. If all traded products are imported (exported) the ratio will be 1 (100%), implying that 100 percent of the traded goods between country i and j are imported (exported) by country i. Any values above the 0.5 means that, the country import more than 50 percent of the traded products with country j. For instance, if z=x and the ratio is above 0.5, means that the country i exports more than half of the all the traded products to its partner's states.

number of exported products accounted to about 30% of all exported products and 15% of all imported in the EAC markets. While improving substantially over time, still the number of traded products to Rwanda and Burundi have remained low, as it accounted to about 23 % of all number of exported products and 2% of all number of imported for Rwanda and about 24 % of all number of exported products and 1% of all number of imported for Burundi.

Of total traded products during this period, similar traded products (i.e. export and import of similar goods) that is meant to gauge the existence of Tanzania intra-industry trade in the EAC markets, has improved modestly over time. As shown in Figure 6, the number of similar traded products has increased from 195 products in 2001 (i.e. 11 % of all traded goods) to 476 products in 2005 (i.e. 24% of all traded goods), an equivalent 144% increase, and further to 826 products in 2012 (i.e. 38% of all traded goods) an equivalent 324% increase; before falling to 602 products in 2021 (i.e. 34% of all traded products).

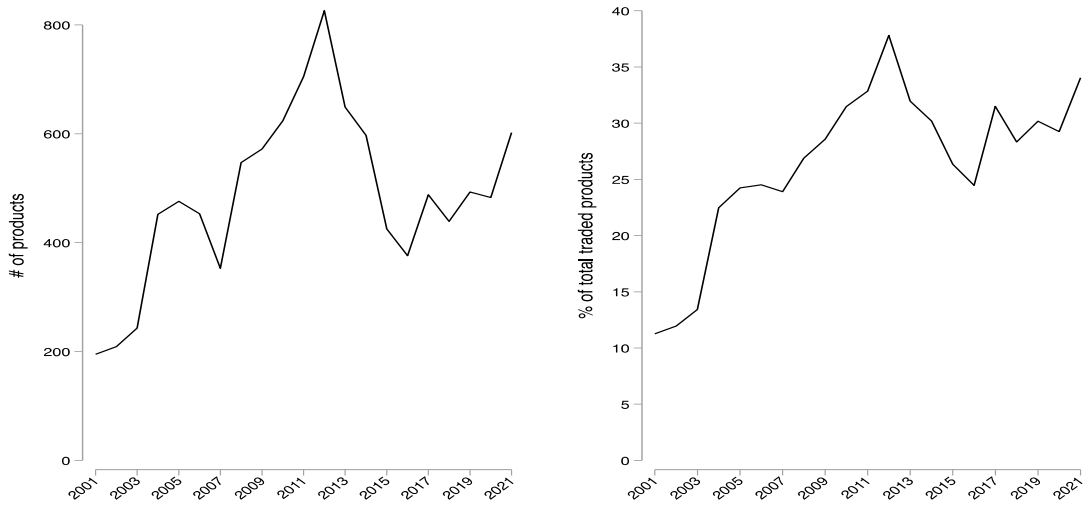
Figure 5: The number and share of traded goods in EAC markets by Partner State



***Notes**:* The figures at top (left and right) show the number of exported and imported products to and from Kenya and Uganda respectively. The figure at bottom shows the share of the products over the total traded products with the EAC Market.
***Source**:* Author's Compilation based on ITC Trade Map Data

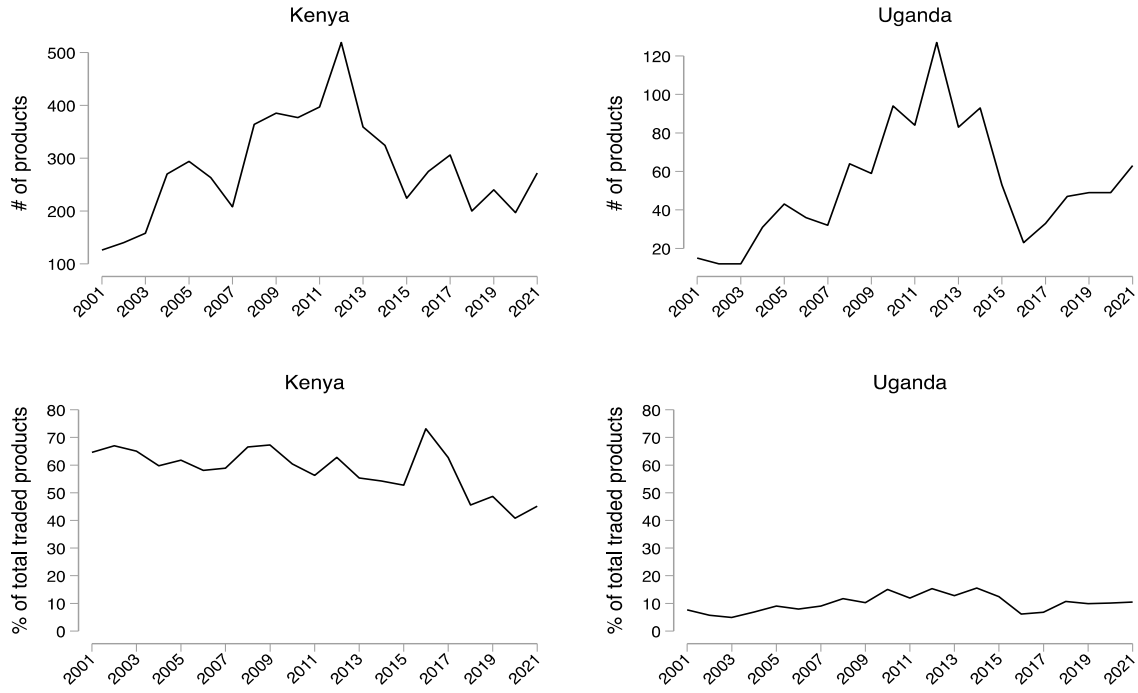
As it has been for the general traded products, even with similar traded products, Kenya has remained a dominant trading partner for Tanzania products in EAC markets. For instance, they were 126 traded products with Kenya in 2001 (equivalent to 65% of all similar traded product), that has increased to 385 traded products in 2010 (equivalent to 67% of all similar traded product), before falling to 272 in 2021 (equivalent to 45% of all similar traded product). On average for the entire period (2001 -2021) Kenya has remained the giant trade partner of Tanzania in EAC markets in similar traded products as it accounted to nearly 60%, followed by Uganda 10%, Rwanda 2% and Burundi 1%.

Figure 6: The number and share of similar traded goods in EAC marktes



Notes: The left figure show the number of similar traded goods with the EAC market
***Source**:* Author's Compilation based on ITC Trade Map Data

Figure 7: The number and share of similar traded goods by each Partner State



Notes: Figure above reports the # and share (in %) of similar traded products for Kenya and Uganda. The share (bottom figures) is expressed as percent of all similar traded products with the EAC markets.

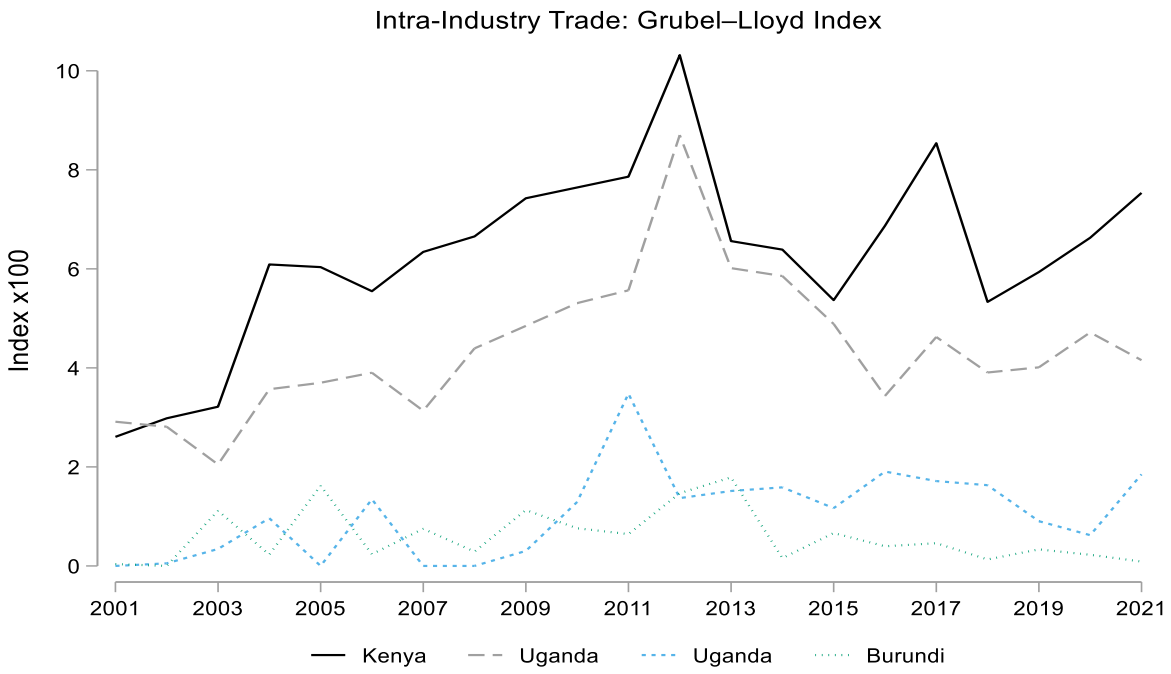
Source: Author's Compilation based on ITC Trade Map Data

5. Export Diversification and Intra-Industry Trade: Discussion of Findings

The key question this study set to address is whether Tanzania is diversifying and moving up the value chain as the result of forming EAC in 2000, thereafter a custom union in 2005 and a single custom territory since 2014. Has the EAC custom union and single custom territory altered Tanzania pattern of trade structure in the EAC markets from more of inter-industry trade (exporting and importing dissimilar products) to more of intra-industry trade (exporting and importing similar products) as a measure of both export diversification and competitiveness, which is a good measure of any country trade performance.

As presented in Appendix Table B1 and Figure 8, we now unpack the intra-industry trade and show how it has changed over time between Tanzania and its trading partners in the EAC markets. To that end, we are employing the Grubel-Lloyd Index (GLI), which measures the proportion of intra-industry trade as a good measure of both export diversification and competitiveness of a country in particular markets. The empirical literature has shown that compared to other regions, Africa significantly lags behind in intra-regional trade, let alone intra-industry trade (World Bank, 2002; Brulhart 2009; UNCTAD, 2011; Gonzalez, J.L and Cirera, X, 212). The index, as alluded earlier, is very sensitive to the level of aggregation of trade data, as the more disaggregated the trade data are, the better the results are.

Figure 8: Average Grubel–Lloyd Index at 6 HS Code for All Products: 2001 – 2021



***Source**:* Author's Compilation based on ITC Trade Map Data

Our analysis, therefore, is based on the 6 HS Code digit level, which is the narrowest definition of 'industry' available, meaning that only simultaneous import and export of products in the same product line are deemed intra-industry. Thus, we define export diversification in terms of changes in the number of products, not partners. By extension, the change in a number of products is the same as entry into new markets that produce similar but slightly differentiated products through pro-import competition, which too is a measure of competitiveness. Empirical literature abounds have shown that comparing to other regions of the world, Africa lags behind significantly when it comes to intra-regional trade leave alone intra-industry trade. While for instance GLI for North America and Western European countries range between 55% and 65% and those for Asian countries between 15% and 35%; those for SSA are less than 5% for most countries (World Bank, 2002; Brulhart 2009; UNCTAD, 2011; Gonzalez, J.L and Cirera, X, 212; Gallucci, T. 2019).

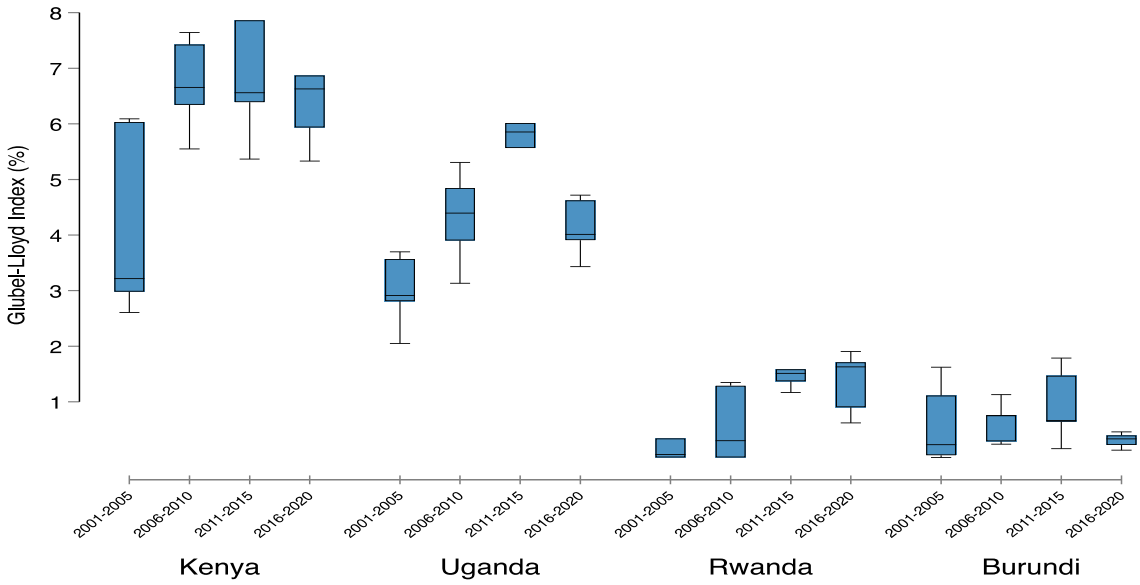
Both Appendix Table B1 and Figure 8 present the summary of Tanzania intra-industry index (GLI) with its trading partners in the EAC markets, and how that have been changing from 2001 to 2021. All indices (out of 100) were calculated at 6-digits of HS

code and averaged across all products for each Partner State. Unlike what has been the case for most countries in Africa, the Tanzania GLI with its trading partners in the EAC markets, especially Kenya and Uganda, have moderately improved over time. As shown in Figure 8, Tanzania has relatively high intra-industry trade index with Kenya followed closely by Uganda, and by far lower intra-industry trade index with Rwanda, and Burundi (all of these reflecting the structure of economies of this countries). The trend reveals that while the GLI for both Kenya and Uganda was around 2 % in 2001, they increased to 6 % for Kenya and 4% for Uganda in 2005, rising further to 10% for Kenya and 8 % for Uganda in 2012 before deteriorating slightly to 8% for Kenya and much further to 4% for Uganda in 2021.

Furthermore, Kenya and Uganda have thus attained the performance slightly above the SSA region average, as on average for the entire period the inter-industry trade with Kenya has been at about 7% while that with Uganda at about 5%, as shown in Figure 9. Rwanda and Burundi has the lowest inter-industry trade with Tanzania at 1% each. On average therefore Tanzania GLI in EAC markets stands at 6%, which above most countries in SSA (most countries have less than 5%).

To further understand how intra-industry indices have performed over time at a product category level, we aggregated the results at the 6 HS Code digit level into 15 categories (sectors) for Tanzania trading for all partners' states, as shown in Table 3. The results reveal that the intra-industry trade is fairly distributed across all 15 sectors with high domination of products classified as transportation (9%), machinery/electrical (6%), plastic/rubbers (6%), stone/glass and metals (5%), wood and wood products (4.8%) vegetable product and foodstuffs (4.7%), and hides and skins (4.6%). The transportation sector, for instance, experienced the highest intra-industry trade with an average GLI of 11.8% from 2006-to 2010 and 10.9% from 2011-to 2015.

Figure 9 The average GLI for each trading partner's state in the EAC market: 2001-2020



***Source**:* Author's Own Compilation based on ITC Trade Map Data

Notes: The graph shows the average Grubel-Lloyd Index for each trading partners states from 2001 to 2020.

Table 3: Intra-Industrial Trade Index (GLI): 2001-2021

		Grubel-Lloyd Index (%)				
#	SECTOR	2001-2005	2006-2010	2011-2015	2016-2020	2021
1	Animal & Animal Products	2.305	3.491	2.597	1.850	1.125
2	Vegetable Products	4.008	3.501	4.697	3.865	3.989
3	Foodstuffs	5.321	6.803	4.910	4.347	3.234
4	Mineral Products	3.835	2.082	4.770	2.978	0.329
5	Chemicals & Allied Industries	3.806	4.320	3.694	3.548	4.171
6	Plastics / Rubbers	4.486	5.847	7.205	6.458	4.700
7	Raw Hides, Skins, Leather, & Furs	1.971	4.028	4.878	5.134	7.143
8	Wood & Wood Products	4.074	6.049	4.592	4.233	5.231
9	Textiles	3.986	3.951	4.417	3.962	3.402
10	Footwear / Headgear	1.635	2.518	2.604	4.023	1.295
11	Stone / Glass	4.334	4.514	6.101	4.027	5.396
12	Metals	2.953	5.104	5.883	3.857	4.793
13	Machinery / Electrical	3.490	7.707	8.668	5.253	5.210
14	Transportation	6.409	11.767	10.908	7.297	7.911
15	Miscellaneous	2.807	4.904	6.983	6.103	4.896

***Source**:* Author's Own Compilation based on ITC Trade Map Data

Notes: All GLI (in %) is calculated at HS code of digit 6 and averaged across the 15 sectors

Table 4: Intra-Industrial Trade for Kenya at 6 HS Code Digit: 2001-2021

		Grubel-Lloyd Index (%)				
#	SECTOR	2001-2005	2006-2010	2011-2015	2016-2020	2021
1	Animal & Animal Products	2.854	4.500	3.919	2.758	1.814
2	Vegetable Products	5.977	4.538	5.913	4.961	4.636
3	Foodstuffs	6.953	8.755	6.474	7.001	4.755
4	Mineral Products	5.251	2.742	8.181	7.318	0.373
5	Chemicals & Allied Industries	4.064	5.152	4.126	4.778	7.865
6	Plastics / Rubbers	4.924	6.862	9.316	9.112	5.872
7	Raw Hides, Skins, Leather, & Furs	1.951	4.385	7.256	7.405	16.667
8	Wood & Wood Products	4.041	6.727	5.520	6.046	8.922
9	Textiles	4.104	4.645	5.208	5.237	5.441
10	Footwear / Headgear	2.391	3.010	3.161	6.000	3.885
11	Stone / Glass	4.807	5.594	8.189	7.319	9.980
12	Metals	3.406	6.923	7.774	6.773	8.978
13	Machinery / Electrical	3.867	9.302	10.119	7.851	9.578
14	Transportation	7.439	14.482	14.903	12.171	14.410
15	Miscellaneous	3.058	6.467	8.618	7.932	7.436

***Source**:* Author's Own Compilation based on ITC Trade Map Data

Notes: All GLI (in %) is calculated at HS code of digit 6 and averaged across the 15 sectors

In addition to the overall sector-level analysis above (Table 3), we also consider the analysis across the sector for each trading partner in the EAC markets. Table 4 presents the summary of Tanzania GLI with Kenya and how that has changed from 2001 to 2021. As what was already alluded in Figure 8, Kenya is trading in the EAC markets for which Tanzania has relatively seen somewhat improvement in GLI compared to other countries in EAC. The intra-industry trade across all sector and for all period have stayed closely to what we have seen in Table 3. As shown in Table 4, on average the top sectors that have seen significant improvement are transportation (9%), machinery/electrical (8%), plastic/rubbers and hides and skins (7.5%), stone/glass and metals (7 %), wood and wood products (6%) vegetable product and foodstuffs (5%).

Table 5: Intra-Industrial Trade for Uganda at 6 HS Code Digit: 2001-2021

		Grubel-Lloyd Index (%)				
#	SECTOR	2001-2005	2006-2010	2011-2015	2016-2020	2021
1	Animal & Animal Products	2.066	3.224	0.663	0	0

2	Vegetable Products	2.855	3.272	6.371	4.626	7.217
3	Foodstuffs	0.750	5.091	6.179	3.828	6.287
4	Mineral Products	3.663	1.696	4.194	0.983	0.858
5	Chemicals & Allied Industries	4.560	3.422	6.071	5.137	2.480
6	Plastics / Rubbers	5.282	7.514	9.393	11.662	11.007
7	Raw Hides, Skins, Leather, & Furs	2.273	4.722	0	2.105	0
8	Wood & Wood Products	5.696	4.876	4.162	4.603	5.568
9	Textiles	4.580	3.192	3.197	2.483	3.811
10	Footwear / Headgear	0	2.902	2.002	3.429	0
11	Stone / Glass	2.964	2.373	5.022	2.975	6.689
12	Metals	2.669	1.679	5.080	1.412	2.785
13	Machinery / Electrical	2.416	5.189	9.020	3.264	2.457
14	Transportation	3.269	11.646	8.716	5.726	1.595
15	Miscellaneous	2.467	2.684	5.544	7.900	6.647

***Source**:* Author's Own Compilation based on ITC Trade Map Data

Though the Tanzania GLI with Uganda has is at about 5% on average, only few sectors are above this average compared to Kenya. As shown in Table 5, the highest intra-industry trade has been dominated mainly by plastic/rubbers (9%), transportation (6%), wood and wood products (5%) vegetable product and foodstuffs (5%) and machinery/electrical (4.5%). For the case of Rwanda as for Burundi the GLI has remained very low on average at about 1% the entire period. For instance, except transportation (5%), textile (2%) and the machinery/electrical (2) for Rwanda, and transportation (4%) and textile (1%) for Burundi, as shown in Appendix Tables B2 – B3, the remaining sectors have less than 1% of GLI.

The results above are further decomposed by ranking the intra-industry trade indices (i.e. GLI) for selected years to reflect how the patterns of traded intra-industry products have changed over times as presented in Appendix Figures B1 - B3. The top 6 traded intra-industry products in the order of ranking, as shown in Appendix Figure B1, in 2001 were: wood and wood products; foodstuffs; vegetable products; mineral products; stone/glass and textiles. That changed slightly in 2010 to: transportation;

plastic/rubbers; foodstuffs; vegetable products; machinery/electrical and hides and skins and in 2015 to: transportation; machinery/electrical; wood and wood products; foodstuffs; hides and skins and metals. More recently in 2020 the top 6 traded intra-industry trade are: plastic/rubbers; transportation; vegetable products; chemicals and allied industries; machinery/electrical and textiles. Clearly, as seen, there have been a moderate shift from wood and wood products and foodstuffs and vegetable products in early 2000s to transportation and plastic/rubbers in 2015 and 2020. Appendix Figures B2 – B3, decomposes these findings further more into exports and import shares.

In summary, while there has been a moderate improvement of inter-industry trade indices, mastery with Kenya and Uganda in the EAC markets, as IIT indices increased from about 2% in 2000 to 10.3% for Kenya in 2012 (before declining to 8% in 2021) and 8.7% for Uganda in 2012 (before declining to 4% in 2021), this only gives indication of potential intra-industry trade (greater than 0.33 is indications for intra-industry trade). When we limit analysis only for Kenya and Uganda for the entire period on average the IIT index is nearly 5.5 % (Kenya about 6.5% and Uganda about 4.5%) and for all EAC trading partners for the entire period it drops to 3.5% (as Rwanda and Burundi has consistently maintained lower IIT of less than 1%). As the intra-industry trade indices of Tanzania in most of EAC markets is less than 33% (preferably more than 50%), largely this is an indication that Tanzania trade in the EAC markets have significantly remains inter-industry a further indication of lack of structural convergence mainly reflecting lack of regional integration value chain. These findings to greater extent corroborate by a couple studies that have looked on Africa and East Africa who found that African and East Africa trade remains overwhelmingly of the inter-industry type, as most countries have less than 5% of IIT index (see Brülhart, M., 2009; Gonzalez, J. L. and Cirera, X., 2012; Ofa, S.V., et al., 2012). Clearly, for Tanzania and its trading partner in the EAC to attain structural convergence (i.e. economic

transformation) countries in the regional has to enhance regional integration value chain, that too can act as springboard into global value chain.

6. Estimation Results

We further compliment the intra-industry findings above with estimation of what could explain or determine Tanzania intra-industry trade in EAC markets. We discuss the empirical results on the determinants of intra-industry trade based on an econometric model of equation 3. We first present the overall determinants for all sectors before reporting sector-level results. The dependent variable is the intra-industry trade index (IIT: Grubel – Lloyd index) measured out of 100. All specification controls for product-level fixed effects (6-digit HS code) and year fixed effects. The robust standard errors are reported in the parentheses.

Table 6 presents the determinants of intra-industry trade with the EAC trading partners for different specifications. The estimates in column 1 controls for trading partner's GDP (a measure of market size), dummy for custom union, distance, exchange rate and trade openness with the partner states. The estimated coefficients corroborate previous studies that found positive effects of market size and trade integration as the coefficients on GDP and Custom Union are positive and statistically significant (Cadot, O., *et al*., 2013). The estimates show that 1 % growth in GDP of the trading partner states improves (on average) the intra-industry trade index (GLI) by 0.0178 (1.9%). The period under the custom union shows the greater contribution of this performance, as on average the estimated coefficient 0.009 implies 0.9 % contribution.

In column 2, we include a dummy for a single customs territory and in column 3 we include the dummies for both custom union and a single customs territory; after controlling for both of these the effects negative and statistically significant against the expectation. This might be due to the recent fall in intra-industry trade between Tanzania and its trading partners as alluded in earlier section or there is a counter association with trade openness variable that too turns negative. In column 4, we estimate the effects of economic disparity between Tanzania and its trading partner in

EAC on intra-industry trade performances.

Table 6: Determinants of Intra-Industry Trade:

	Dep. Variable: IIT Index				
	(1)	(2)	(3)	(4)	(5)
GDP (log)	1.780***	1.780***	1.780***		
	(0.077)	(0.077)	(0.077)		
Custom Union	0.902*		-1.589***	-0.310	0.118
	(0.430)		(0.477)	(0.443)	(0.436)
Single Custom Territory		-0.902*	-2.491***		
		(0.430)	(0.441)		
Economic Disparity				-17.464***	
				(0.935)	
Income Disparity					-6.103***
					(0.295)
Distance (log)	-11.094***	-11.094***	-11.094***	-32.876***	-22.848***
	(1.206)	(1.206)	(1.206)	(1.475)	(1.258)
Exchange Rate (log)	-1.050***	-1.050***	-1.050***	-2.561***	-3.041***
	(0.156)	(0.156)	(0.156)	(0.189)	(0.197)
Trade Openness (log)	-0.733*	-0.733*	-0.733*	-1.677***	3.321***
	(0.368)	(0.368)	(0.368)	(0.380)	(0.379)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Sector Fixed Effects	Yes	Yes	Yes	Yes	Yes
R-squared	0.028	0.028	0.028	0.027	0.027
Observation	49921	49921	49921	49921	49921

Note: Robust standard errors are in parenthesis.

We compute the economic disparity measure as provided in the formula in equation (4). As what have been found in the empirical literature, we also find a negative and statistical significant effects, the results which resonate with our earlier discussion on the pattern of trade in the EAC markets that Tanzania tends to trade more (in terms of exports and imports) with Kenya and Uganda than with Rwanda and Burundi (as the latter two countries have high economic disparity with Tanzania). In column 5, we use the difference in per capita income to measure income disparities and as before, the results are negative and statistically significant; one thing to note though, is that now is both the coefficients on custom union and a single custom union are positive thought not statistically significant what that on trade openness is positive and

statistically significant.

The coefficients on other variables are as what found in other empirical studies. For instance, the coefficients on geographical distance and exchange rate effects in all estimations (columns 1-5) are negative and statistically significant. The estimates results on the determinants of intra-industry trade by sector are as presented in the Appendix Tables C1 – C2.

7. Conclusions and Implications

The formation of East Africa Community in 2000 that has progressed into a Custom Union in 2005 and thereafter into a single custom territory in 2014 is expected, according to Krugman's monopolistic trade theory, to increase the number of Tanzania's firms (products) in the EAC markets that produce similar but slightly differentiated products (increasing export diversification and competitiveness) and trade volume due to large markets size and lower trade costs. Thus, after more than 20 years of EAC, 16 years of EAC-CU and nearly 7 years of a single custom territory, this study assess whether Tanzania's pattern of trade structure in the EAC markets has changed from more of inter-industry trade (exporting and importing dissimilar products) to more of intra-industry trade (exporting and importing similar products) as a measure of both export diversification and competitiveness, which is a good measure of structural convergence (economic transformation) and improvement in regional value chain.

Our analysis, therefore, is based on the 6 HS Code digit level, which is the narrowest definition of 'industry' available, meaning that only simultaneous import and export of products in the same product line are deemed intra-industry. Thus, we define export diversification in terms of changes in the number of products, not partners. By extension, the change in a number of products is the same as entry into new markets that produce similar but slightly differentiated products through pro-import competition, which too is a measure of competitiveness.

Using disaggregated trade statistics at 6 HS Code and applying Grubel-Lloyd Index (GLI) this study find that while there has been a moderate improvement of inter-industry trade indices, mostly with Kenya and Uganda in the EAC markets, as IIT indices increased from about 2% in 2000 to 10.3% for Kenya in 2012 (before declining to 8% in 2021) and 8.7% for Uganda in 2012 (before declining to 4% in 2021). This only gives indication of potential intra-industry trade as an indication for intra-industry trade

requires a country to have an ITT greater than 33%. When we limit analysis only for Kenya and Uganda for the entire period, on average, the IIT index is nearly 5.5 % (Kenya about 6.5% and Uganda about 4.5%). When we allow for all EAC trading partners for the entire period, the index dropped to 3.5%; this is the case as Rwanda and Burundi has consistently maintained lower IIT of less than 1%.

As the intra-industry trade indices of Tanzania in most of EAC markets is less than 33% (preferably is required to be more than 50%), largely this is an indication that Tanzania trade in the EAC markets have significantly remains inter-industry, a further indication of lack of structural convergence (economic transformation) mainly reflecting lack of regional integration value chain. These findings to greater extent corroborate a couple studies that have looked on Africa and East Africa who found that African and East Africa trade remains overwhelmingly of the inter-industry type, as most countries have less than 5% of IIT index (see Brülhart, M., 2009; Gonzalez, J. L. and Cirera, X., 2012; Ofa, S.V., et al., 2012).

In addition, while the market size, regional integration and trade openness are found to promote intra-industry trade; geographical distances, exchange rate and economic disparity adversely affect ITT. Clearly, for Tanzania and its trading partner in the EAC to attain structural convergence (i.e. economic transformation) countries in the regional has to enhance regional integration value chain, that too can act as springboard into global value chain.

References

Alemayehu, G and Haile Kibret (2000). "Regional Economic Integration in Africa: A Review of Problems and Prospects with a Case Study of COMESA", Addis Ababa University Working Paper #1.

Balassa, B. (1986), "Intra-Industry Specialization: A Cross-country Analysis", *European Economic Review,* 30, 27- 42

Baier, S. L. and Bergstrand, J. H. (2009) *Estimating the Effects of Free Trade Agreements on International Trade Flows Using Matching Econometrics*. Journal of International Economics 77[1], 63-76.

Bergstrand, J. (1983), *Measurement and Determinants of Intra-Industry International Trade*, in: P. K. M. Tharakan(Eds.), "Intra-Industry Trade".

Brülhart, M. (2009). An Account of Global Intra-industry Trade, 1962–2006. The World Economy, 32(3), 401-459.

Cadot, O., Carrere, C., and Strauss-Kahn, V. (2013). Trade diversification, income, and growth: what do we know?. Journal of Economic Surveys, 27(4), 790-812.

Gallucci, T., Dimitrova, V., Marinov, G (2019), 'Interrelation between Eco-Innovation and Intra-Industry Trade—A Proposal for a Proxy Indicator of Sustainability in the EU Countries' *Sustainability*

Grubel, H. G. and Lloyd, P. J. (1975). Intra-industry trade: the theory and measurement of international trade in differentiated products. New York: Wiley

Grossman, G.M. and E. Helpman (1991), Innovation and Growth in the Global Economy, (Cambridge, Ma, and London, The MIT Press), 1991.

Helpman, Elhanan and Krugman, Paul (1985), *Market Structure and Foreign Trade,* MIT

Helpman, E. and P. Krugman, (1989),' Trade Policy and Market Structure, (Cambridge, MA, and London, The MIT Press).

Helpman, E., Melitz, M., and Rubinstein, Y. (2008) *Trading Partners and Trading Volumes*. Quarterly Journal of Economics 123[2], 441-487.

Helpman, E., and O. Itskhoki (2010), 'Labor Market Rigidities, Trade and Unemployment: A Dynamic Model', Review of Economic Studies, 77, 1100-1137

Hansen, H., Rand, J., Leyaro, V. and Mtui, J. (2017), 'Bilateral Aid in a Structural Model for Bilateral Trade: Insights from a Model for Tanzania', *DoE-DERG Working Paper*

Kol J. and Mennes. (1985). Intra-industry Specialization: Some Observartions on Concepts and Measurement*, Journal of International Economics 21(1986)*, 173-181.

Kohr, Leopold. 1960. "The History of the Common Market," *Journal of Economic History*.

Krugman P (1979) Increasing Returns, Monopolistic Competition, and International Trade. Journal of International Economics. 9: 469-79.

Krugman PR. 1980. Scale Economies, Product Differentiation, and the Pattern of Trade. American Economic Review. 70: 950-59.

Krugman, P. R. (1995), 'Increasing Returns, Imperfect Competition and the Positive Theory ofInternational Trade', in Grossman, G. and Rogoff, K. (eds) , *Handbook of International Economics. Vol. 3*, Amsterdam: Elsevier.

Lipsey, R. G. (1960) The theory of customs unions: A general survey. The Economic Journal 70 (279): pp. 496-513.

Mead, J.E. (1950). *The Theory of Customs Union*s. Amsterdam: North-Holland Publishing Compan

Melitz, Marc 2003, "The impact of trade on intra-industry reallocations and aggregate productivity", Econometrical 71(6)1695-1725, 1695-1725.

Ofa, S.V., Spence, M., Mevel, S and Karingi, S (2012), 'Export Diversification and Intra-Industry Trade in Africa', *UNECA-ECA Working Paper*

Viner, Jacob (1950). *The Customs Union Issu*e. London: Stevens & Sons Limited.

Sharma, K. (2002), "Horizontal and Vertical Intra-Industry Trade in Australian Manufacturing: Does Trade Liberalisation have any impact?", School of Management, Charles Stuart University Working Paper No. 47/02.

Steven Buigut (2012) 'An Assessment of the Trade Effects of the East African Community Custom Union on Members Countries', *International Journal of Economics and Finance*, Vol. 4 # 10

Steven Buigut (2016), 'Trade Effects of the East African Community Customs Union: Hype Versus Reality', South African Journal of Economics, Vol. 84 #3

Shinyekwa M. B. Isaac (2015)' Has the East African Community Regional Trade Agreement Created or Diverted Trade? A Gravity Model Analysis' Journal of Sustainable Development; Vol. 8, # 9

World Bank Group and World Trade Organization, (2015), 'The Role of Trade in Ending Poverty', World Trade Organization: Geneva.

Appendices

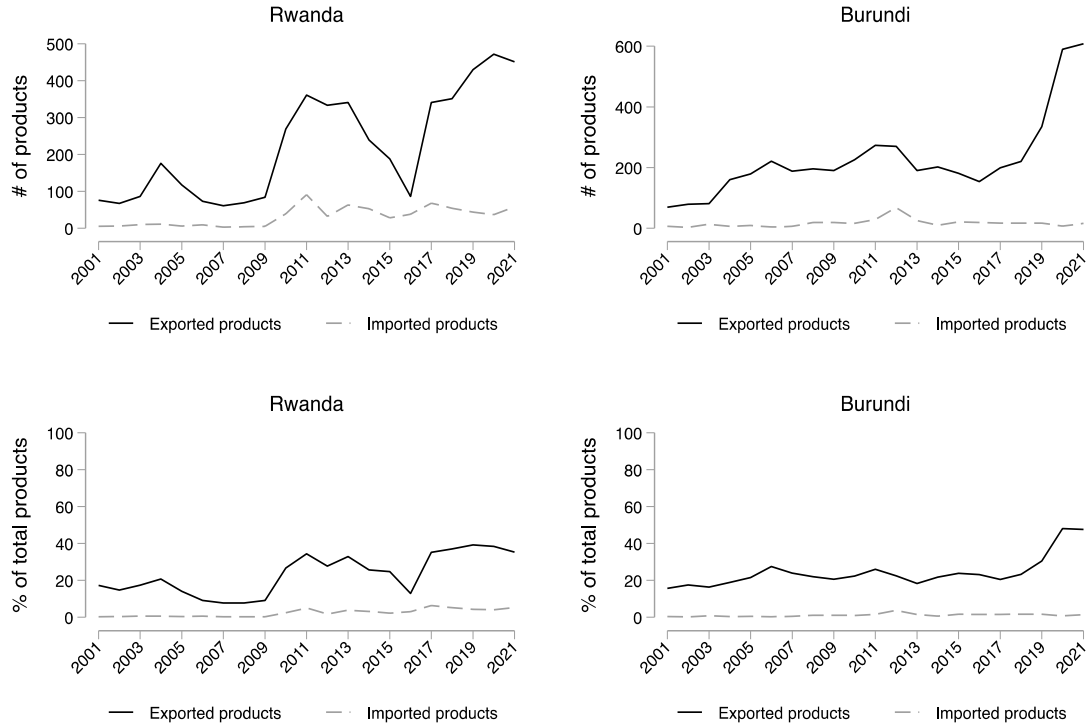
Appendix A: Descriptivie Statistics

Table A1: Tanzania Export and Import Share for EAC Comparing to the Total

	Export			Import			Total Trade		
YEAR	TOTAL	EAC	SHARE	TOTAL	EAC	SHARE	TOTAL	EAC	SHARE
2001	768.30	52.03	6.77	1728.87	107.52	6.22	2497.17	159.56	6.39
2002	901.35	52.27	5.80	1691.12	98.95	5.85	2592.47	151.23	5.83
2003	1131.97	94.81	8.38	2164.28	126.51	5.85	3296.26	221.32	6.71
2004	1473.07	167.13	11.35	2556.43	139.29	5.45	4029.50	306.42	7.60
2005	1671.74	161.97	9.69	3246.79	181.05	5.58	4918.53	343.02	6.97
2006	1864.65	192.17	10.31	4526.68	223.36	4.93	6391.33	415.53	6.50
2007	2139.30	258.01	12.06	5918.98	110.06	1.86	8058.28	368.07	4.57
2008	3121.04	355.69	11.40	8087.69	448.36	5.54	11208.74	804.05	7.17
2009	2982.38	284.98	9.56	6530.79	316.89	4.85	9513.18	601.87	6.33
2010	4050.52	558.01	13.78	8012.81	295.16	3.68	12063.33	853.17	7.07
2011	4734.92	408.87	8.64	11184.20	378.06	3.38	15919.11	786.93	4.94
2012	5547.22	613.26	11.06	11715.55	678.53	5.79	17262.77	1291.79	7.48
2013	4412.50	421.61	9.55	12525.36	396.98	3.17	16937.87	818.59	4.83
2014	5704.63	598.11	10.48	12691.09	706.42	5.57	18395.72	1304.53	7.09
2015	5854.17	924.90	15.80	14705.92	278.67	1.89	20560.10	1203.56	5.85
2016	4399.79	269.72	6.13	7688.97	295.81	3.85	12088.76	565.53	4.68
2017	4094.26	349.53	8.54	7710.22	236.22	3.06	11804.48	585.74	4.96
2018	3797.34	500.70	13.19	8513.98	302.57	3.55	12311.33	803.27	6.52
2019	4932.66	663.80	13.46	9077.08	328.29	3.62	14009.74	992.10	7.08
2020	5984.79	798.13	13.34	8477.63	322.81	3.81	14462.42	1120.94	7.75
2021	6390.81	1152.21	18.03	10873.25	523.32	4.81	17264.05	1675.53	9.71

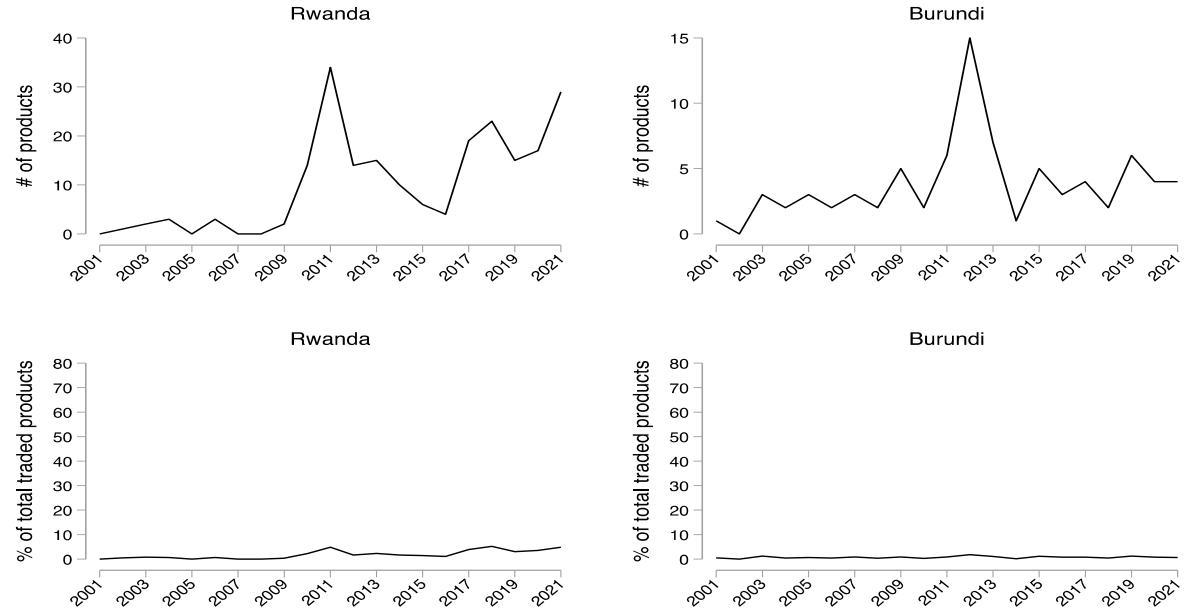
Notes. All figures are in millions of USD. Data Source: ITC Trade Map

Figure A1: The number and share of traded goods in EAC markets by Partner State



***Notes**:* The figures at top (left and right) show the number of exported and imported products to and from Kenya and Uganda respectively. The figure at bottom shows the share of the products over the total traded products with the EAC Market. ***Source**:* Author's Compilation based on ITC Trade Map Data

Figure A2: The number and share of similar traded goods by each Partner State



Notes: Figure above reports the # and share (in %) of similar traded products for Kenya and Uganda. The share (bottom figures) is expressed as percent of all similar traded products with the EAC markets. ***Source****:* Author's Compilation based on ITC Trade Map Data

Appendix B: Intra-Industry Trade Index

Table B1: Intra-Industrial Trade Index (GLI) for each trading Partner: 2001-2021

	Grubel-Lloyd Index (%)			
Year	Kenya	Uganda	Rwanda	Burundi
2001	2.607	2.912	0.000	0.038
2002	2.981	2.811	0.052	0.000
2003	3.215	2.050	0.343	1.115
2004	6.089	3.570	0.963	0.230
2005	6.035	3.699	0.000	1.622
2006	5.548	3.903	1.347	0.238
2007	6.342	3.134	0.000	0.750
2008	6.655	4.394	0.000	0.289
2009	7.425	4.848	0.302	1.128
2010	7.644	5.308	1.292	0.760
2011	7.862	5.566	3.479	0.642
2012	10.317	8.701	1.369	1.469
2013	6.560	6.015	1.514	1.788
2014	6.389	5.855	1.587	0.158
2015	5.368	4.887	1.168	0.664
2016	6.869	3.433	1.906	0.397
2017	8.538	4.624	1.714	0.459
2018	5.332	3.907	1.631	0.131
2019	5.935	4.011	0.904	0.334
2020	6.628	4.717	0.621	0.225
2021	7.534	4.156	1.850	0.088

Source: Author's Compilation based on ITC Trade Map Data

Table B2: Intra-Industrial Trade for Rwanda at 6 HS Code Digit, 2001-2021

		Grubel-Lloyd Index (%)				
#	SECTOR	2001-2005	2006-2010	2011-2015	2016-2020	2021
1	Animal & Animal Products	0	0	0	1.887	0
2	Vegetable Products	0.028	0.577	0.658	0	0.491
3	Foodstuffs	0	0	0.323	0.308	2.368
4	Mineral Products	0	1.358	2.188	0.068	0.203
5	Chemicals & Allied Industries	0.560	0.352	0.141	0.109	0.047
6	Plastics / Rubbers	0	1.167	0.441	1.052	0.218
7	Raw Hides, Skins, Leather, & Furs	0	.	0	0	0
8	Wood & Wood Products	0	0.535	3.902	0.214	1.504
9	Textiles	1.832	2.556	2.379	0.975	2.087
	Footwear / Headgear	0	0	0	0	0

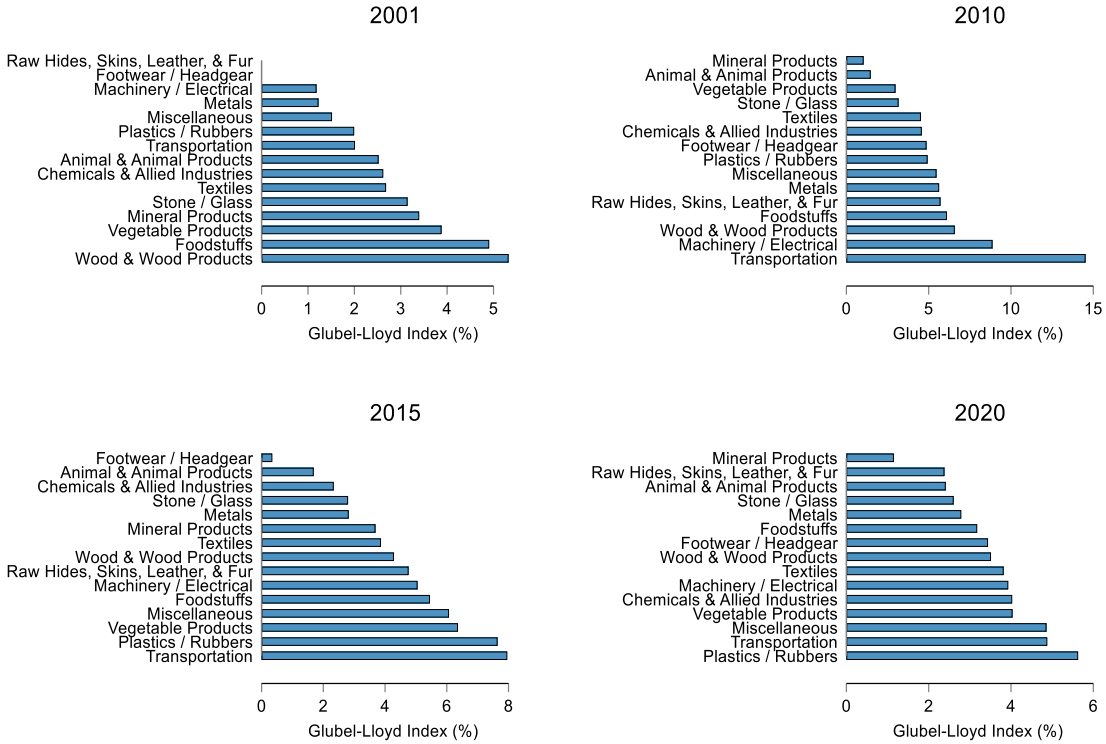
10						
11	Stone / Glass	0	2.746	1.913	0	0.050
12	Metals	0	0.469	0.544	1.105	2.975
13	Machinery / Electrical	0	0.834	3.811	2.324	2.506
14	Transportation	3.788	0.766	5.174	3.129	12.436
15	Miscellaneous	0	0	3.628	3.073	1.317

Table B3 Intra-Industrial Trade for Burundi at 6 HS Code Digit, 2001-2021

		Grubel-Lloyd Index (%)				
#	SECTOR	2001-2005	2006-2010	2011-2015	2016-2020	2021
1	Animal & Animal Products	0	0	0	0	0
2	Vegetable Products	0.365	0	0.405	0	0
3	Foodstuffs	0	0	1.099	0.374	0
4	Mineral Products	0.110	0.636	0.004	0	0
5	Chemicals & Allied Industries	0	0	0.411	0.458	0
6	Plastics / Rubbers	0	0	0.786	0.191	0
7	Raw Hides, Skins, Leather, & Furs	0	0	0	0	0
8	Wood & Wood Products	0	0	0.018	0.788	0
9	Textiles	2.222	0.774	1.101	1.037	0.055
10	Footwear / Headgear	0	0	0	0	0
11	Stone / Glass	0	0	0	0.884	0
12	Metals	0	0	0.466	0.020	0.273
13	Machinery / Electrical	0	0.439	2.201	0.242	0
14	Transportation	8.571	5.612	3.686	0.168	1.192
15	Miscellaneous	0	0	1.378	0.071	0

Source: Author's Compilation based on ITC Trade Map Data

Figure B1: Ranking of GLI at 6 HS Code for selected years



Source: Author's Compilation based on ITC Trade Map Data

Figure B2: Ranking of sector export share for selected years

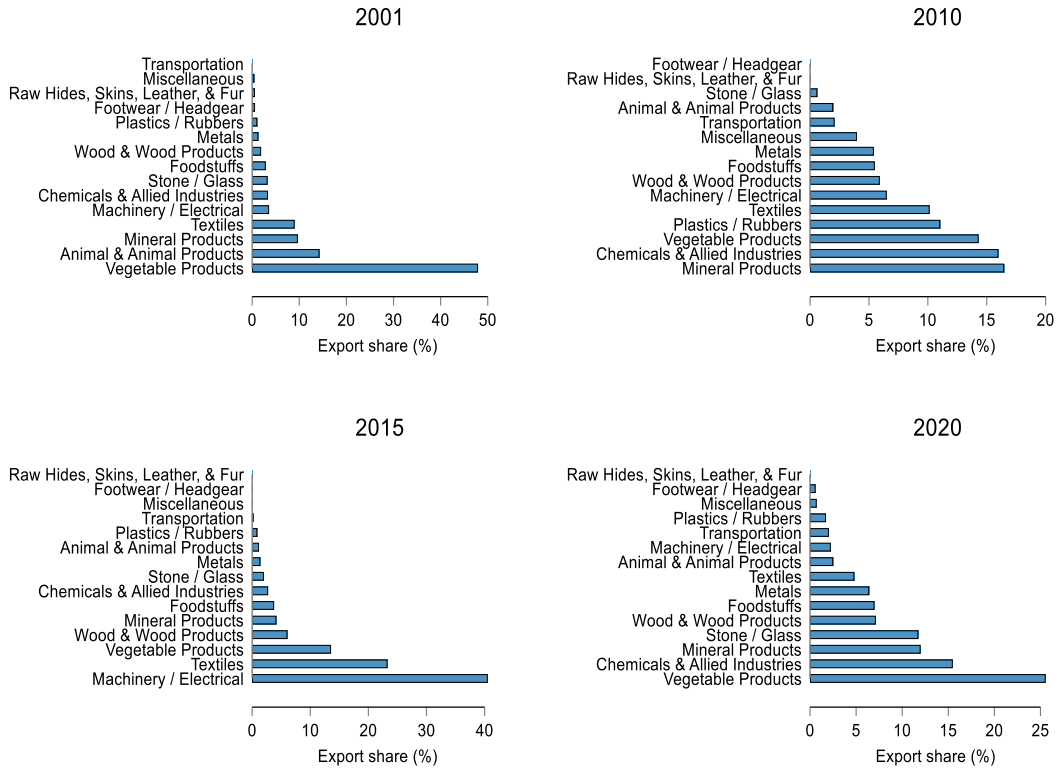
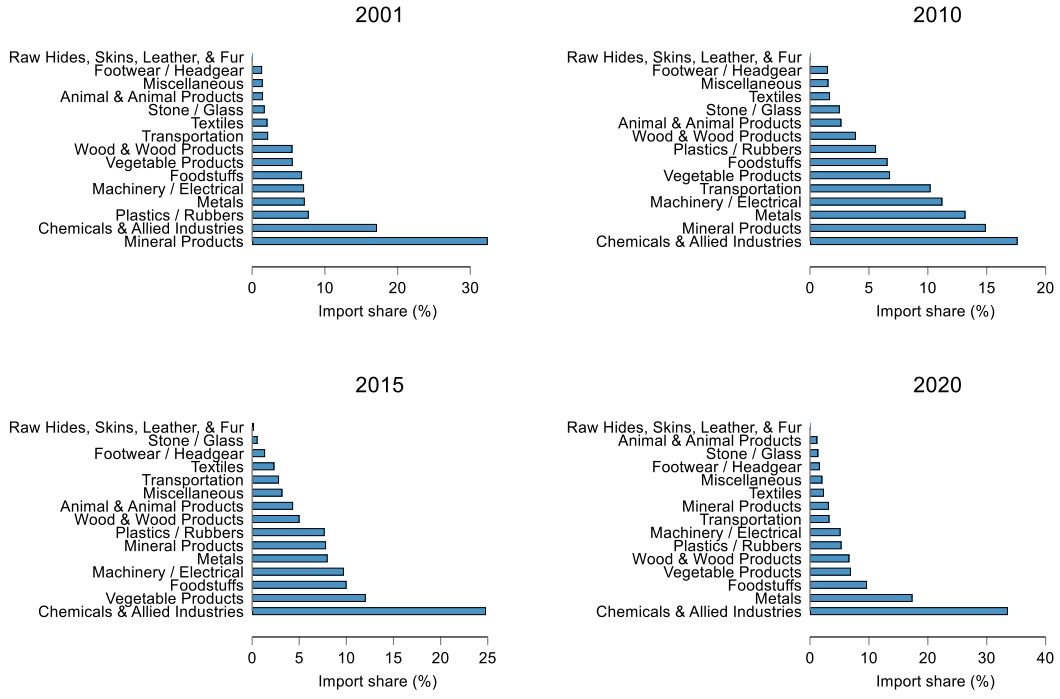


Figure B3: Ranking of sector Import share for selected years



Source: Author's Compilation based on ITC Trade Map Data

Appendix C: Estimation Results

Table C1: Determinants of Intra-Industry Trade:

	Dep. Variable: IIT Index							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Anim.	Veg.	Food	Min.	Chem.	Plastics	Hides	Wood
GDP (log)	0.255	1.659***	1.708***	1.254***	1.945***	3.711***	0.951	1.447***
	(0.230)	(0.235)	(0.333)	(0.276)	(0.235)	(0.368)	(0.602)	(0.366)
Custom Union	0.630	-1.528*	-0.101	-0.916	-0.582	0.209	1.243	0.326
	(0.834)	(0.609)	(0.930)	(0.986)	(0.498)	(0.828)	(1.901)	(0.890)
Single Custom Territory	-0.928	-0.370	-0.999	-0.923	-1.295**	-0.754	-0.518	-1.854*
	(0.718)	(0.684)	(0.677)	(0.753)	(0.438)	(0.765)	(1.940)	(0.816)
Distance (log)	-3.283	-13.397***	-23.419***	-7.201	-16.670***	-19.681***	-3.152	-8.595
	(6.070)	(2.973)	(3.738)	(5.282)	(2.278)	(4.084)	(12.748)	(6.850)
Exchange Rate (log)	0.034	-1.696***	-2.071***	0.046	-1.962***	-3.335***	0.495	-0.901
	(0.611)	(0.392)	(0.560)	(0.661)	(0.374)	(0.691)	(1.290)	(0.841)
Trade Openness (log)	3.387*	1.016	2.506	-2.227	0.046	1.024	-2.176	-1.947
	(1.511)	(1.121)	(1.543)	(1.668)	(0.901)	(1.623)	(3.621)	(1.534)
Constant	4.558	51.690*	110.415***	30.149	69.037***	47.214	8.069	34.936
	(44.083)	(21.728)	(25.453)	(35.207)	(15.583)	(26.183)	(90.144)	(45.365)
Sector Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.065	0.033	0.053	0.036	0.038	0.041	0.021	0.014
Observation	1577	3552	2608	1406	6680	3233	436	2634

Table C2: Determinants of Intra-Industry Trade by Sector…….(continues)

	Dep. Variable: IIT Index						
	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Tex.	Foot.	Stone	Metals	Mach.	Trans	Misc.
GDP (log)	1.342***	0.964*	1.726***	1.678***	2.566***	2.118***	2.642***
	(0.307)	(0.399)	(0.475)	(0.193)	(0.218)	(0.511)	(0.321)
Custom Union	-0.933	0.336	0.449	1.767**	3.368***	4.071**	1.686*
	(0.674)	(0.960)	(1.212)	(0.556)	(0.549)	(1.337)	(0.822)
Single Custom Territory	-1.653*	0.013	-1.612	-2.315***	-4.063***	-4.832***	-0.396
	(0.649)	(1.241)	(0.969)	(0.437)	(0.479)	(1.194)	(0.787)
Distance (log)	1.280	-7.746	-7.985	-7.648**	-1.232	-13.156	-3.573
	(5.696)	(4.678)	(6.952)	(2.449)	(3.911)	(10.000)	(6.251)
Exchange Rate (log)	0.571	-0.543	-0.295	-0.246	-0.025	-0.418	-0.532
	(0.633)	(0.799)	(0.898)	(0.335)	(0.457)	(1.166)	(0.811)
Trade Openness (log)	-1.183	-1.834	-0.603	0.013	0.631	0.795	2.147
	(1.354)	(2.057)	(1.998)	(1.006)	(1.054)	(2.557)	(1.747)
Constant	-31.695	37.386	18.187	13.607	-50.712	40.355	-43.004

	(41.724)	(30.974)	(47.327)	(17.344)	(27.275)	(69.190)	(41.257)
Sector Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.037	0.020	0.025	0.036	0.027	0.044	0.033
Observation	4421	754	1707	6096	9750	1920	3147

Source: Author's Compilation based on ITC Trade Map Data