Trade complementarities between Europe and Tanzania

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Abstract

The research aimed at studying the movements in comparative advantage of Tanzanian exports and identifying opportunities for trade with Europe. Comparative advantage is measured using Balassa's index and Volrath Index as robustness check. Additionally, trends in intra-industry trade between Tanzania and the world and with Sub-Saharan Africa is measured using Grubel-Loyd Index. All the products under HS-2-digit classification were studied from 2009 to 2018. Tanzania's exports still rely heavily on raw materials such as stone and glass, animals, vegetables. However, from 2012 onwards Tanzania has gained export advantage in intermediate goods. These intermediate exports are highly correlated with exports of textiles and clothing as well as processed vegetables. Tanzania has an opportunity to export processed fish and animal products to Europe. All these are chances to industrial growth through widening the market. In addition, we find import opportunities in rubber and plastic, transportation, chemical and woods. All these products can be used in the production process, hence removing of trade barriers will lower the cost of production for the local industries. Trade between Tanzania and the rest of the world is found to be inter-industry as opposed to intra-industry except for textile products. The research adds to the pool of literature for Tanzanian exports and offers policy implications on which sectors can be improved and the country is implementing export promotion strategy towards industrialization.

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1. Introduction

While Tanzania is moving towards industrialization, European Union is waiting for Tanzania to sign the EU-EAC trade agreement. Among the routes to industrialization is through export promotion, which is also in accordance with Tanzania's policies. However, the question remains: will this trade agreement help Tanzania towards industrialization through exports? This paper answers this question by showing possibilities of trade between Tanzania and Europe using the theories of comparative advantage.

Industrialization is very essential for structural transformation and high-quality employment to any nation (Naudé and Szirmai 2012). Dodzin and Vamvakidis (2004) suggest that developing countries that increase their openness to trade are more likely to increase their share of industrial production at the expense of agricultural products. However, Vamvakidis, 2002 found that developing countries are more resistant to trade than developed nations, and Tanzania is no different.

Industrialization has long been seen as a road towards development, as experience shows that more developed nations are characterized by a large sophisticated industrial sector. Tanzania aims to transform into a semi-industrialized nation by 2025. Policymakers believe that this can be achieved through resource-based industrialization and human development to become a competitive export led economy. The economy is at the phase of improving the share of tech-related goods production in GDP. The share of low-tech goods to improve from 17 to 29%, medium tech from 11 to 24 and high tech from 2 to 6 percent of GDP between 2015 to 2020. While the exporting firms were targeted to increase from 247 to 729 firms during the same period. It is high time to evaluate these targets.

As Tanzania intends to attain its industrialization through exports, it is imperative that it attains comparative advantage with its trading partners in these sectors. This study aims to compute and analyse movements in comparative advantages and trade complementarities of Tanzania and Europe with and with the rest of the world from 2009 to 2018. This analysis period will allow evaluation of the several intervention strategies that have been implemented from the National Five-Year Development Plan 2015/16 -2020/21 as the period will provide the before and after implementation comparison.

This research will be in line with the overall objective of the programme to support the capacity of policy makers on widening trading opportunities with the EU. This research will highlight trading opportunities between Tanzania and the EU hence provide additional information to policy makers regarding the Economic Partnership Agreement between EU and East African Community.

The rest of this paper is organized as follows: the next subsections highlight the objectives of the research and methodology. Section 2 and 3 details the Tanzania trade with the world and different trade blocks while Section 4 and 5 analyse the trend of export diversification and intra-industry trade. Descriptive statistics of competitive indices are examined in section 6. Trends of revealed comparative advantage (RCA) and revealed trade advantage (RTA) are examined in section 7 and 8 respectively. Section 9 elaborate trends of trade complementarities between Tanzania and Europe whereas section 10 examines the trend of intra industry trade. Conclusion and policy recommendations are given in Section 11.

1.2 Objectives of this Research

i. Investigate the movements in comparative advantage in Tanzania's exports.
ii. Investigate the trade complementarities between Tanzania and European countries.
iii. Investigate presence of intra-industry trade between Tanzania and European Countries.

1.3 Methodology

The objective of the study is to investigate the changes in competitiveness Tanzanian exports. As proposed in theory that competitiveness can be measured by presence of significant amount of product's exports. In this work we examine the trade advantage of Tanzanian manufacturing firms by using the formula introduced by Volrath (1987;1989), as used by Štefan Bojnec (2001), and the original Balassa's index as in equation 1.

$$RXA = \left(\frac{X_a^i}{X_t^i}\right) \div \left(\frac{X_a^w}{X_t^w}\right) \quad (1)$$

$$RMA = \left(\frac{M_a^i}{M_t^i}\right) \div \left(\frac{M_a^w}{M_t^w}\right) \quad (2)$$

$$RTA_a = RXA_a - RMA_a \qquad (3)$$

where:

RTA: Relative Trade Advantage

RXA: Revealed Export Advantage

RMA: Revealed Import Advantage

X: Exports

M: Imports

a, i, t and w: Particular industry, Tanzania, total and world, respectively

Balassa's index examines the Revealed Export Advantage, and hence, is equivalent to the RXA. Tanzania is considered to have a Revealed Export Advantage in a particular industry if the share of the industry's exports in Tanzanian total exports is greater than, or equal to, the share of the industry's exports in the world's exports (i.e., RXA_a), is greater than or equal to one. The same interpretation goes to the Revealed Import Advantage (RMA).

Tanzania has a Relative Trade Advantage in a certain industry if RXA_a is greater than the RMA_a (i.e. RTA > 0) and will have a disadvantage if the RTA < 0. The denominator will be changed accordingly from the world to Europe; hence, the same interpretation has been used to investigate the Tanzanian Revealed Trade Advantage with Europe. The use of RTA is important in this study especially considering we are dealing with trade between regions. A region may have vast number of exports but if some of those exports are actually imported with in the same region than that will deflate the actual comparative advantage between the region and the rest of the world.

In addition, the research also seeks to analyse movement in intra-industry trade using Grubel Lloyd Index (1971) which can be computed as follows.

$$GL_i = \frac{(X_i + M_i) - (/X_i - M_{i/})}{X_i + M_i} \qquad (4)$$

Where i represent a particular industry, X is export and M is import.

Hence the GL index ranges from 0 to 1, whereby 0 means there is no intra-industry trade for that particular industry, either Tanzania only imports or only exports. When GL_i is equal to 1, then Tanzania's imports and exports of that industry are equal.

Data: The goods are categorized using 2-digits HS classifications and downloaded from World Integrated Trade Solutions by World Bank Group. The exports and imports are analysed in two stages. First by the level of technology used; Capital goods, Consumer goods,

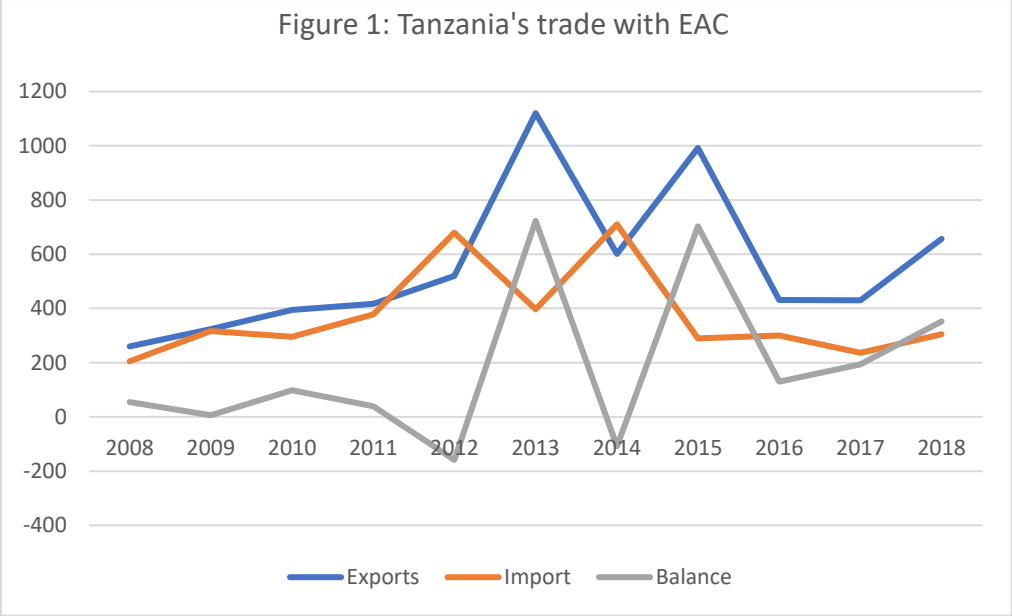
intermediate goods and raw materials. Second by the nature of the products; Animal, chemical, food products, hides and skins, machines and electrical appliances, metals, miscellaneous, minerals, plastic and rubber, stone and glass, textiles and clothing, transportation, vegetables and wood. The data that can be accessed is from 2009 to 2018.

2. Tanzania's openness to trade

Trade openness is positively related to export diversification (Osakwe et al., 2018; Dodzin and Vamvakidis 2004 among others). This trade openness can be multilateral, where each country is freely trading with all countries in the world or the very common one through regional trade agreements (RTAs). According to the WTO there are 349 RTAs as of 15th June 2021.

Tanzania has also opened up her economy to various trade blocks. This opening up provides challenges and opportunities to Tanzania's productive capacity (Osakwe et al., 2018). Apart from being a member of the WTO since 1995, Tanzania has also joined other regional agreements, such as the Southern African Development Community (SADC), the East African Community (EAC) among others.

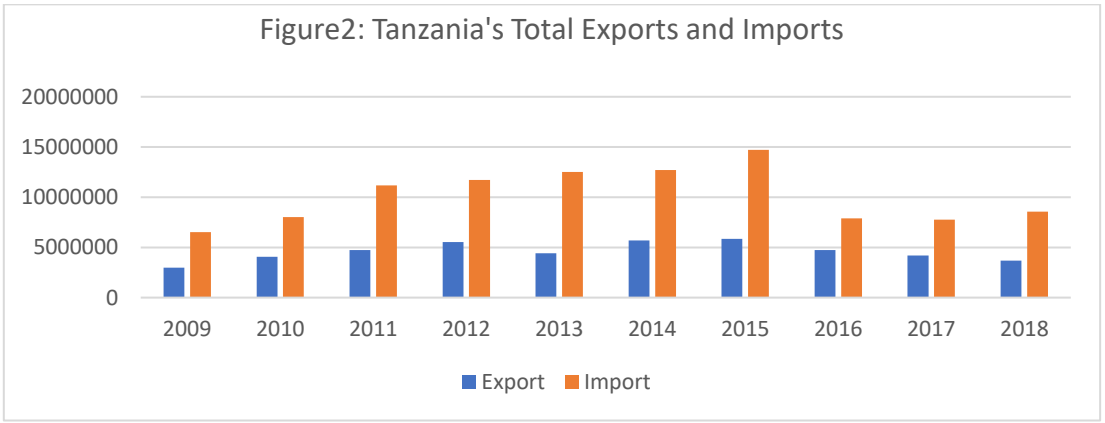
Even though geographically, Tanzania is the biggest country in EAC, its trade volumes within EAC are below Uganda and Kenya and just slightly above Rwanda when it comes to EAC exports in 2018. Over the past decade trade between Tanzania and EAC have only grown by 20% and 14% average annual growth of exports and imports respectively. The trend however is interesting, when Tanzania faced trade deficit in 2014 and decided to decrease its importation in 2015, exports had also declined in 2016, leading to another decline in trade balance (see figure 1)



Source: East African Community Facts and Figures - 2019

Tanzania also engages in multilateral trade, where the majority of trade occurs. Among the top trading partners are China, EU, United Arab Emirates, Japan, India, Kenya and South Africa. Tanzania's main exports to these countries include minerals, cash crops such as tobacco, coffee, cashew nuts and sisal, manufactured goods, horticultural products, and fish. While main imports include transport equipment, machinery, petroleum, fertilizers, industrial raw materials, food and other consumer goods.

Tanzania is enjoying a decline in trade deficit which is not due to increase in exports only but also decrease in imports, however the rate of decline in imports exceeds the growth of exports. As a matter of fact, just like within the EAC region, a substantial decline in imports after 2015 is also accompanied by decrease in exports.

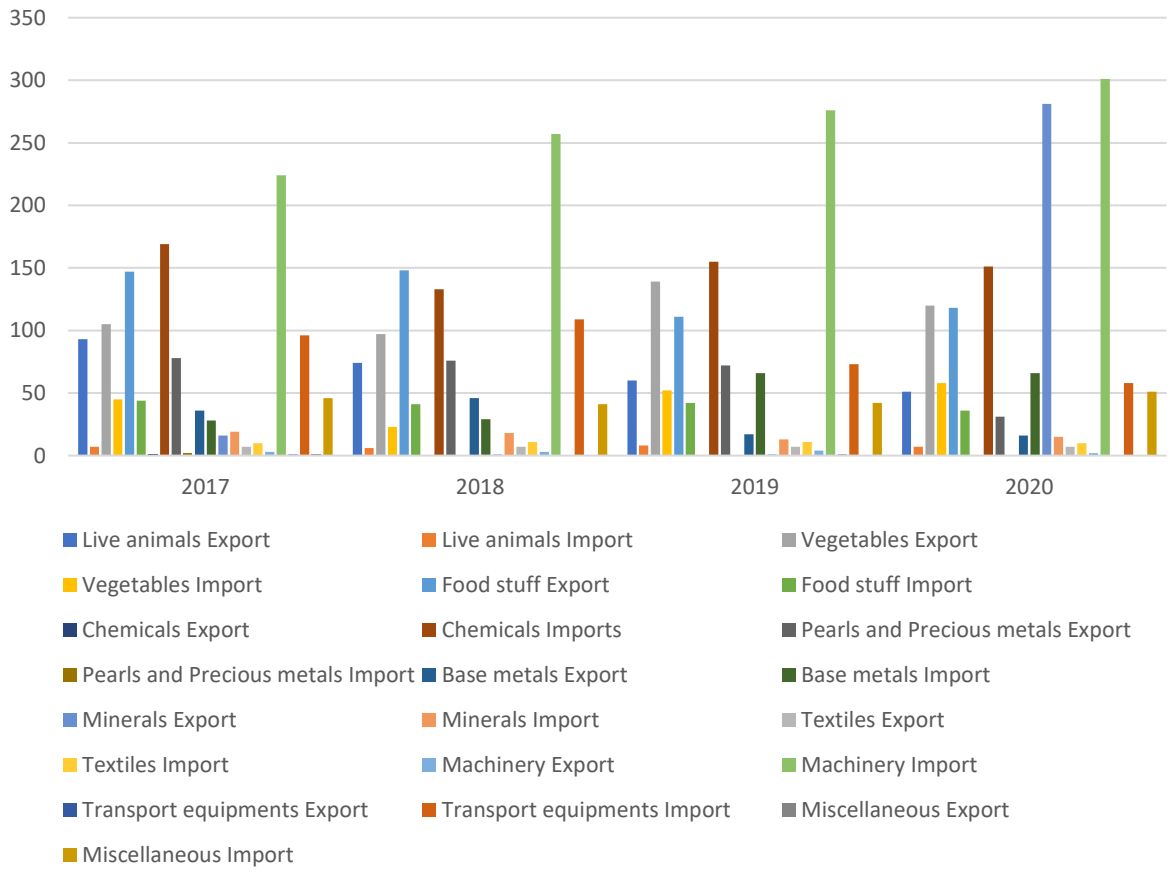


Source: WITS, 2021

3. Trade complementarities between Tanzania and European Union

Europe ranks 3rd trade partner with Tanzania with imports worth million € 472 and exports of million € 419 in 2020. The trade between Tanzania and Europe has continuously been increasing from 2018 to 2020. The main exports from Tanzania to Europe are live animals, vegetables, minerals and textiles. While the main imports are chemicals, base metals, machinery and transportation. Good volume of intra-industry trade, where both exports and imports appear in the same group of products is visible in food stuff, textiles, and base metals.

Figure 3: Trade between Tanzania and Europe



4. Export Diversification

Tanzania is a resource rich economy, and its exports are moderately diversified in terms of type of products. According to the UNCTAD database the export concentration index has remained stable from 2010 to 2020 ranging between 0.2 and 0.3. Export diversification can be through different goods but are in the same level of production like either primary goods,

intermediate goods, or consumer goods. Tanzania being blessed with a variety of resources the diversification can be mostly through primary products. With the industrialization goal, exports need to be diversified from primary to intermediate, capital and consumer goods with different levels of technology.

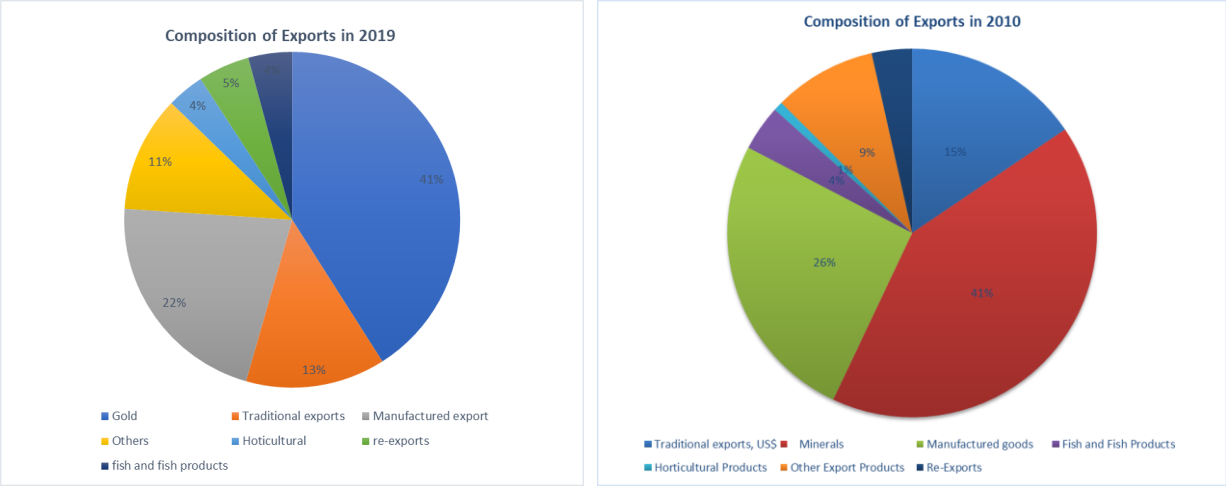
As of 2019 Tanzanian exports constituted 41% exports, 13% traditional exports, that is 54% of total value of exports is from primary products. However, as Tanzania is diversifying through industrialization, 22% was manufacturing export, and 19% were processed fish products and outputs from the horticulture industry. Among manufactured exports only 7% was from processed traditional cash crops such as sisal products, and manufactured tea and coffee, 93% were from other sectors that Tanzania is diversifying towards. Things have remained almost the same for the past 10 years. As a matter of fact, the share of manufacturing exports declined with the rise of horticultural products. The share of traditional exports has declined only by 2 percentage points while the share of mineral exports (where gold is 97%) remained the same.

Diversification is considered an essential pattern for economic development as countries find more production opportunities and create employment to its labour force. Diversification can follow the changes in comparative advantage as suggested by Hekscher-Ohlin theory or through intentional efforts by the government to support specific sectors even though defying its comparative advantage. According to Hekscher-Ohlin theory a labour abundant country will produce and export labour intensive goods while importing capital intensive goods. Schott (2003) introduced the diversification cones while testing the H-O theory, where as a labour abundant country specializes in labour intensive commodities it results in increase in wages and capital accumulation which led the country to diversify into production of more capital-intensive goods.

Alternatively, Lectard and Rougier (2018) found that countries which defy comparative advantage become more diversified and export more sophisticated exports as compared to those following their comparative advantage. In both scenarios the knowledge base and innovative capacity of the economy is highly crucial in reaching diversification. For the case of Tanzania export diversification is through both scenarios. There are exports that are as a result of processed goods which are related to Tanzania factor endowments such as

manufactured coffee and sisal products. There are 93% of manufacturing exports which are not directly related to the country's factor endowment. According to Wangwe et al (2014) 70% of inputs used by the majority of exporting manufactures are imported.

Figure 4: Composition of Tanzanian Exports

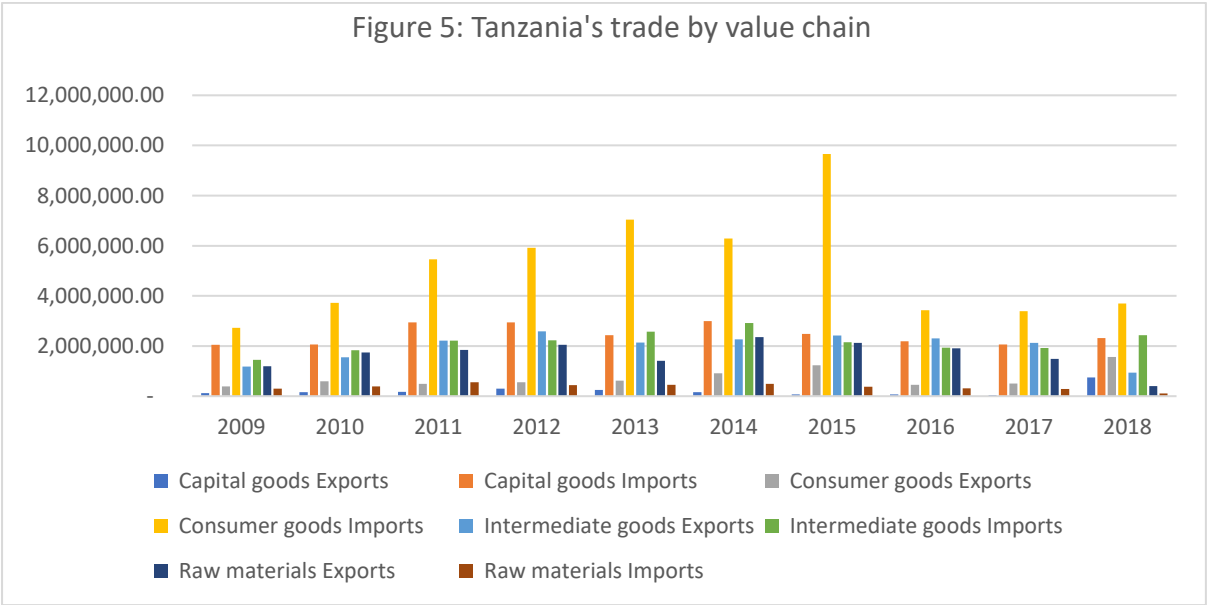


Source: BOT, 2021

5. Intra-industry Trade

Tanzania's imports of consumer goods have declined after 2015 and its exports have increased in 2018. Exports of raw materials have declined and both imports and exports of capital goods increased in 2018 after a decline in 2016 and 2017.

Figure 5: Tanzania's trade by value chain



6. Descriptive Statistics of Competitive Indices

Table 1: Descriptive Statistics

Competitive Index	Tanzania	Europe & Central Asia
Average RXA (number of products)	8	10
Average RMA (Number of Products)	7	13
Average RTA (number of products)	9	8
Average GL (Number of products)	8	21
----------	----------	----------
Maximum RXA	10.60	1.37
Minimum RXA	0.02	0.42
Maximum RMA	4.51	1.34
Minimum RMA	0.09	0.50
Maximum RTA	10.33	0.17
Minimum RTA	-4.44	-0.43
Maximum GL	1.00	1.00
Minimum GL	0.019	0.75

Table 1 shows the summary of the results for the entire study period from 2009 to 2018 for both Tanzania and Europe. It is found that on average Europe and Central Asia have export advantage on 10 groups of products, import advantage on 13 groups and trade advantage in 8 groups of products. Which means there are 8 groups of products that these countries have greater export advantage than import advantage. It is also found that there is intra-industry trade for all groups of goods.

Tanzania on other hand is found to have an export advantage in 8 groups of products and import advantage in 7 groups. The number of goods in which Tanzania had export advantage remained between 7 and 8 throughout except for 2014 when it was 9. The average number of goods that Tanzania has trade advantage (9) has exceeded both those with export and import advantage. These represent some of the goods that Tanzania does not necessarily have export advantage but their share of exports to the rest of the world exceeds their share of imports in relation to the rest of the world. Intra-industry trade is seen to exist in only 8 groups on average. In this study, intra-industry trade is said to exist if the GL is greater than 0.5.

The maximum value of revealed export advantage is found to be 1.37 in Europe and 10.6 in Tanzania. For a country to have revealed export advantage its RXA needs to be greater than or equal to one. In the case of Tanzania, the maximum value is far from one this implies that the export share in the country is far greater than the export share of those commodities in the world. This shows heavy reliance of export on these commodities. This value of 10.6 is found to be the RXA for stone and glass; this group consists of precious or semi-precious stones (HS 71) which is inclusive of gold. According to Bank of Tanzania Economic Review of May 2020, export of gold represents around 32% of total exports in Tanzania. The minimum RXA is 0.02 in Tanzania and 0.42 in Europe and Central Asia. The gap between the maximum and minimum RXA is wider in Tanzania as compared to Europe and Central Asia. This shows that Europe and Central Asia is more diversified in their exports as compared to Tanzania. The very small value of 0.02 shows a very small share in the Tanzanian exports as compared to product's export share in the world. This 0.02 is found on footwear, Tanzania produces and exports very small share of footwear in the world market.

The maximum value of revealed import advantage (RMA) is 4.51 in Tanzania and 1.34 in Europe and Central Asia. Again, an economy has import advantage when RMA is equal to or greater than 1. The RMA of 1.34 shows that the product share in the imports of Europe and central Asia is almost equivalent to the world's import share of that particular product which is Animal products in our current study. The RMA of 4.51 in Tanzania on other hand is found on fuels, implying that the import share of fuels in Tanzania is far greater than the import share of fuels in the world. The minimum import advantage is 0.09 for Tanzania and 0.5 for Europe and Central Asia. This shows that Europe and Central Asia has good import share for all goods while in Tanzania, there goods with very small share of imports. The lowest RMA in Tanzania is found on raw materials showing deficiency of processing industries in Tanzania.

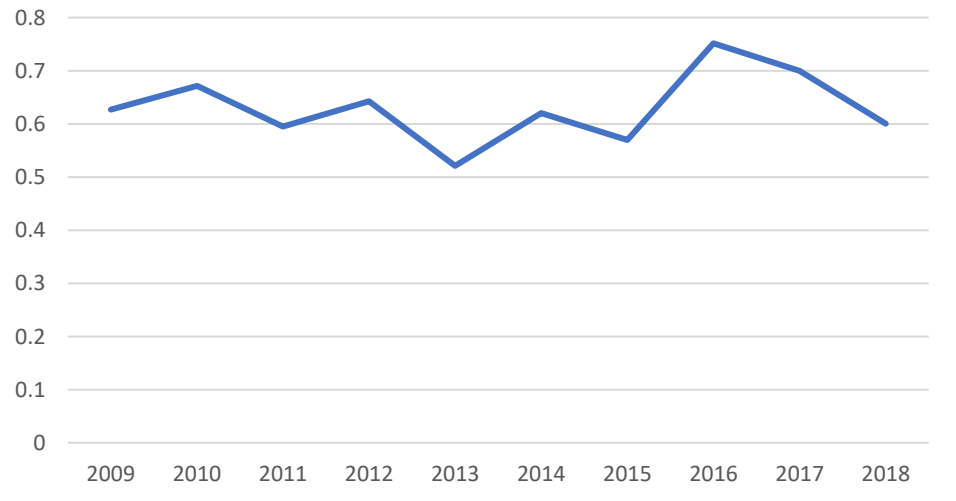
The revealed trade advantage (RTA) is the difference between RXA and RMA; when the difference is positive the economy is having trade advantage, export advantage is greater than import advantage. The maximum value of Europe and Central Asia is 0.17 and the minimum is -0.43 revealing that there is no big difference between the export advantage and import advantage. The small difference also signals presence of intra-industry trade as the share of exports and not far from the share of imports in the same industry. Tanzania on the other hand has maximum of 10.33 and minimum of -4.4 implying that there is huge difference

between export advantage and import advantage. Having big numbers on both positive and negative said also shows that lack of sufficient diversification in both exports and imports and signals low intra-industry trade and high inter industry trade.

The Grubel and Lloyd (GL) index shows the extent of intra-industry trade, where 0 means absence of intra-industry trade and GL of equal to 1 means the amounts of exports and imports in a particular industry is the same. Hence very good level of intra industry trade. The minimum GL for Europe and Central Asia is found to be 0.75 showing as that all industries are above 0.5, as discussed above on average intra-industry trade is present in all industries. The maximum value is 0.99 which is approximated to 1.00 in the table 1. As a matter of fact, most industries displayed a GL of 0.9 and above for Europe and Central Asia.

The minimum GL for Tanzania was found to be 0.019 which indicates almost absence of intra-industry trade in some industries. From the analysis as we will also see the trend later most the industries in Tanzania had a GL of below 0.5. Even the GL for total products averaged at 0.63 indicating low level of intra-industry trade nationwide for the entire period of study. As shown in the figure 1 the overall index had hardly reached 0.8. The trend had remained between 0.5 and 0.7 with exception of small improvement in 2017 which also could not be maintained. The maximum value was found to 0.99 which is approximated on 1. Only a handful of products were found to have GL of 0.9 and above. These products are intermediate goods, food products, textiles and clothing and vegetables. Imports and exports of intermediate goods is a good sign of progress in processing industries.

Figure 6: Aggregate Intra-Industry trade for Tanzania



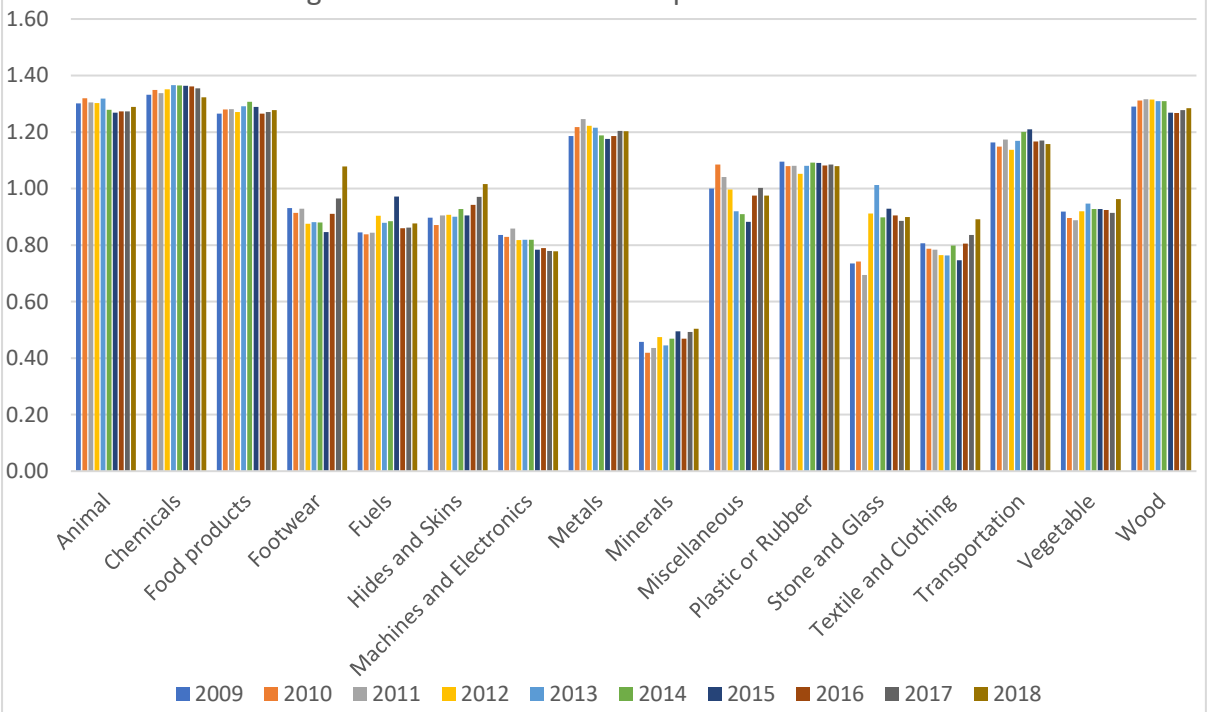
7. Revealed Comparative Advantage (RCA)

7.1 Trend of RCA for all goods in Europe and Central Asia

Figure 7 shows the trend of revealed export advantage for 16 groups of products based on 2 digits HS classification from 2009 to 2018 for Europe and Central Asia. Products that have revealed export advantage throughout the study period are animals, chemicals, food products, metals, plastic and rubber, transportation and wood. Chemical products rank no 1 amidst the declining trend from 2013 followed by wood products. The region has recently gained export advantage in footwear and hides and skin.

The region has lost comparative advantage in the exports of miscellaneous and stone and glass products. The region has no comparative advantage on fuels, machines and electronics, minerals, textile and clothing and vegetable. Minerals rank the last with an upward trend.

Figure 7: Trend of RCA fo Europe and Central Asia



7.2 Goods that Tanzania has gained RCA over time

Figure 8 shows the trend of revealed export advantage (RCA) of Tanzania from 2009 to 2018. As above this figure also illustrates the trend of 16 groups of products from HS classification. The figure 8 shows that there is huge difference between those goods that the country has RCA and those which it does not. Tanzania has consistently revealed export advantage on exports of animals, food products, stone and glass, textile and clothing and vegetables. Stone

and glass always ranked the first followed by vegetables. As explained earlier on the RCA of stone and glass that is due to big share of gold exports. Vegetables also shows high RCA due the traditional exports of coffee, tea and cloves. In addition, horticulture industry has grown rapidly over the past decade hence increasing the share of vegetable exports (TAHA, 2020)[1]. This is in line with results of Mwasha and Kweka (2014) who analysed the exports using 4 digits HS classification and found a strong RCA in coffee, tea and spices. The decline of RCA in vegetables in 2012 was not due to decline in exports but decline in the export share. The RCA for vegetable has continued to increase after 2012 until 2018, even though the actual exports dropped in 2018. This shows that even if the exports have dropped but in relation to the world Tanzania still had increased comparative advantage.

Third in rank is food products with RCA almost stable throughout the study period. The main export under this category is tobacco. Animals have shown a downward trend of RCA. In this category Tanzania mainly relies on export of fish which has remained rather stable from 2009 to 2018 with slight ups and downs between 150 million USD and 250 million USD. The amount of exports is greater in 2009 as compared to 2018 but it is obviously Tanzania's share of exports in the world is dropping and if the trend continues this way it may lose its comparative advantage.

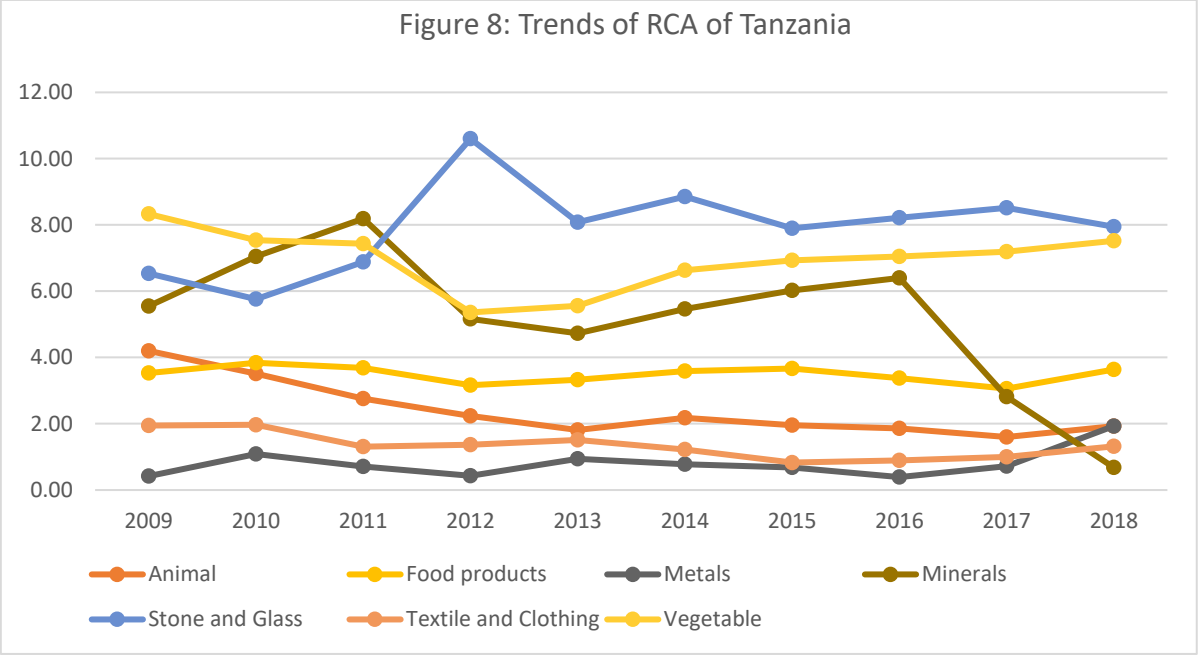
Tanzania has also managed to maintain comparative advantage in textile and clothing except for 2015 and 2016, in 2017 the trend had picked and continued to increase in 2018. RCA in textile and clothing is good sign of progress for industrialization as all the products in this category have to go through some kind of processing before being exported. As a point to be noted, the country has gained comparative advantage in intermediate goods of average of 2.3 from 2012 to the end of study period with an increasing trend. During the period of study Tanzania has gained RCA in metals and lost its advantage in minerals. Other goods that Tanzania has no export advantage on are chemicals, footwear, fuels, hides and skins, machines, and electronics, miscellaneous, rubber and plastics, transportation and wood.

Tanzania, Europe and central Asia share export advantage in only 2 products, animals and food products. Hence, they are in competition in regard to these products, however, does

[1] https://www.freshplaza.com/article/9239162/tanzania-horti-exports-become-a-leading-subsector-that-drives-agricultural-growth/

necessary limit trade between them, the GL index will reveal more on this. Tanzania has comparative advantage in stone and glass, vegetables, and minerals (even though it lost RCA in 2018), in all these product Europe and central Asia have no comparative advantage. On other hand there are goods that Europe and Central Asia have comparative advantage while Tanzania has not, these are chemicals, metals, rubber and plastics, transportation, wood and footwear which is gained in 2018. This show opportunity of inter-industry trade according to Ricardian theory of comparative advantage. Nevertheless, we cannot conclude on the trade opportunities just yet because for there to be export there must be a demand for import, hence we analyse the revealed trade advantage (RTA) in the upcoming sections.

Figure 8: Trends of RCA of Tanzania



8. Revealed Trade Advantage (RTA)

8.1 Trends of RTA for all goods in Tanzania and Europe

A country or region is said to have revealed trade advantage (RTA) on the commodity if it revealed export advantage (RCA) is greater than its revealed import advantage (RMA). Hence for the economy to have trade advantage then RTA needs to be positive. According to Bojnec and Ferto (2012) having positive relative trade advantage is consistent with the ability of an economy to compete both in price and quality while revealed trade disadvantage is consistent with one-way import and unsuccessful competition in both price and quality.

The RTA provide a good measure of the region's comparative advantage with the world as it filters the trade between member states. For example, a good amount of minerals exported

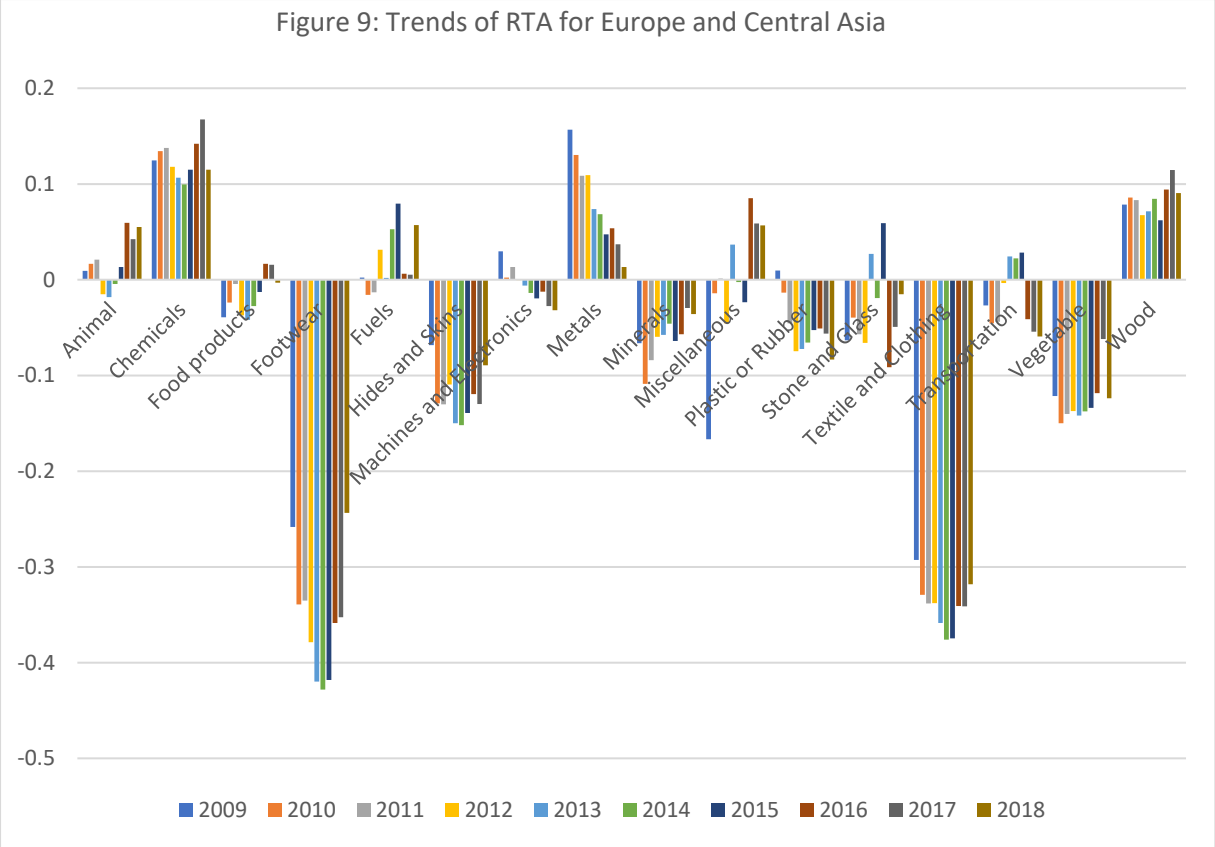
by the Central Asian countries is imported into the European Union, hence even though we found that Europe and Central Asia has revealed export advantage in minerals, it turns out their import demand is also high and the region is actually having a trade disadvantage in minerals. As a matter of fact, according to the report of Directorate-General for trade of European Commission[2] until 2020 even though central Asia is not a major trading partner of EU, Central Asia depends on EU for 16.9% of its imports and 30.8% of its exports.

Figure 4 shows the trend of RTA for Europe and central Asia on all the 16 product categories in the HS 2-digit classification. It is found that the region has strong and consistent revealed trade advantage on chemicals, metals and wood. However, the RTA of metals is of a downward trend. The region also improved its RTA as approaching 2018 in animals, fuels and miscellaneous. Fuels have revealed trade advantage for most years except in 2010 and 2011 and the coefficient of RTA has increased substantially in 2018. Miscellaneous goods have revealed trade advantage continuously from 2016, amidst a decreasing trend.

During the entire period of study, the region has displayed trade advantage in intermediate goods. Trade advantage on capital goods was sustained until 2016 only while trade advantage on raw materials was only revealed in 2017 and 2018. The trade advantage on raw materials is due to increasing exports share of fuels and decreasing of its import share. Consumer goods had positive RTA only in 2018.

The goods that the region had strong trade disadvantage on throughout the study time are footwear, hides and skin, minerals, textile and clothing and vegetables. For Europe and Central Asia even though we have seen in the section above that the region had comparative advantage in these goods but they do have trade advantage, hence they are more likely to importers of these goods than exporters. Having a trade disadvantage means their revealed import advantage (RMA) is greater than their revealed export advantage (RCA). The strongest trade disadvantage is found in consumer goods, such as footwear, textile and clothing and vegetables. However, the study shows that in 2018 the region attained trade advantage in consumer goods. This also evident in the figure 4 as there is a decline in trade disadvantage of footwear and textile and clothes.

[2] https://webgate.ec.europa.eu/isdb_results/factsheets/region/details_central-asia-5_en.pdf *retrieved on 25th May 2021*



8.2 Trends of RTA for all goods in Europe and Central Asia

Figure 10 below shows the trend of RTA of Tanzania for al 16 products during 2009 to 2018. Tanzania shows continuous trade advantage in Stone and Glass, vegetables, minerals, animals, food products and hides and skin. The RTA of animals, vegetable and food products has been going up and down but shows improvement in 2018. The RTA of stone and gold had small decline in 2018 while that of minerals had declined substantially but remained positive. Textile and clothing had trade advantage in all the years except for 2016. In these goods except hides and skin, Tanzania not only have trade advantage but also export advantage. Hence these are goods that Tanzania is able to compete against the world in both cost and quality.

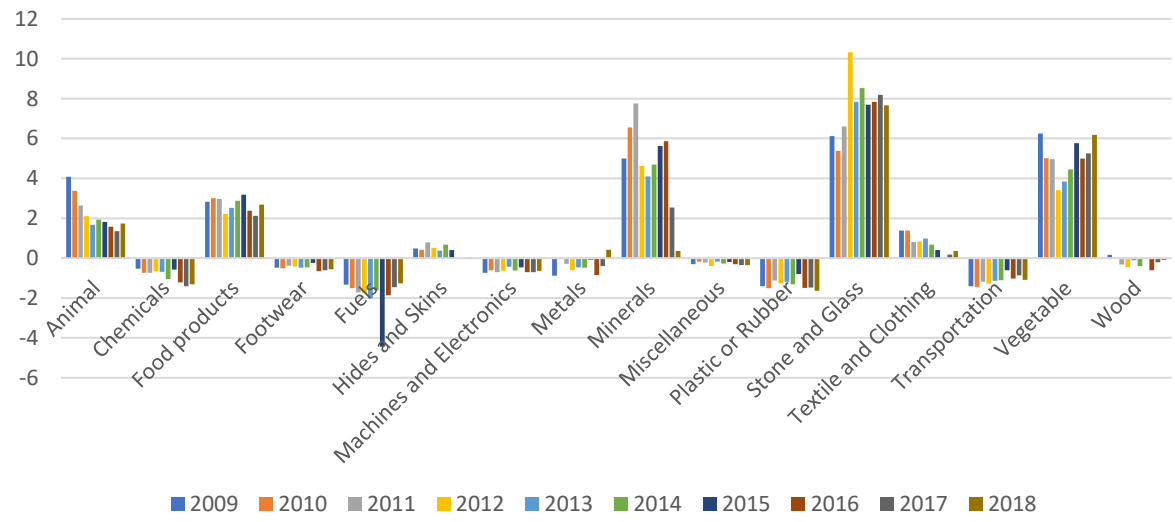
Hides and skin shows positive RTA even though it had no export advantage because its revealed import advantage was even below the revealed export advantage. This shows that there is excess of supply of the product in the country and Tanzania is capable of competing in the world market of hides and skin although its' current share of export is still very small.

Tanzania is mainly importer and revealed trade disadvantage in chemicals, footwear, fuels, machines and electronics, miscellaneous, plastic or rubber, transportation and wood. Metals

has changed its position from trade disadvantage products to trade advantage in 2018. In all these goods that Tanzania had trade disadvantage it also did not have export advantage, hence it is safe to say that it is net importer. Most of these goods are capital and consumer goods.

All in all, Tanzania had trade advantage in raw materials always and gained trade advantage in intermediate goods in 2012 onwards until 2018. Trade disadvantage was continuously revealed in capital and consumer goods. Hence the growth of industrialization is still at very early stages of processing raw materials into intermediate products.

Figure 10: Trends of RTA for Tanzania



From the RTA analysis we found that both Tanzania and Europe and Central Asia have trade advantage only in animal and food products, however the trade advantage in Tanzania is more consistent than that of Europe and Central Asia. Goods that Tanzania had revealed trade advantage while Europe had revealed trade disadvantage are hides and skins, minerals, stone and glass (except 2013 &2015), textile and clothing and vegetables. On other hand, goods that Tanzania had revealed trade disadvantage while Europe had revealed trade advantage are chemicals, fuels (except 2010 &2011), metals (except 2018), miscellaneous (in 2011, 2013, 2016-2018) and wood. Machine and electronics and transportation have revealed trade advantage only in few years, prior to 2016. Goods in which both economies have revealed trade disadvantage are footwear and plastic or rubber.

9. Trade Complementarities between Tanzania and Europe

9.1 Trade Complementarities from Tanzania to Europe and Central Asia

Countries are trade compliments in an industry if one country has revealed export advantage and another has import advantage on the same products. Our study revealed that Europe and Central Asia have revealed import advantage in all products except in fuels, machines and electronics, minerals, and stone and glass. While Tanzania has revealed export advantage in animals, food product, stone and glass, vegetables, and minerals (except in 2018). Hence Tanzania's exports especially on animals, food products, vegetables, textiles and clothing and metals. Currently according to the EU's statistics, EU 27 is second in rank of Tanzania's export destinations. The main export so far are animals, food products and vegetables. Seeing that complementarity also exists in textiles and metals, these are the sectors that Tanzania can improve on. From the RTA analysis we also found that Tanzania has trade advantage in hides and skin where Europe and Central Asia has trade disadvantage, thus is another area of complementarity.

The exports data shows great deal of animals' exports from Tanzania to Europe, we find that import advantage for animals by Europe and central Asia has not been continuous. In 2010 and 2016 Europe and Central Asia RMA has been less than 1 and when we check the trends of RTA, we found trade advantage by Europe in several years except 2012 to 2014. Hence it is advisable that Tanzania looks for other trading opportunities with Europe instead of heavy reliance on animals' exports. Food products on the hand reveal promising trade complementarity from Tanzania to Europe as trade complementarity is shown throughout the study period. In addition, Europe and central Asia has revealed trade disadvantage for these products except for 2016 and 2017.

Complementarity in vegetables is lost in 2017 due to loss in import advantage on the side of Europe and Central Asia. Complementarity in textile and clothing has been revealed throughout the study period. This trade complementarity is backed by the revealed trade disadvantage by Europe and Central Asia throughout the study.

Figure 6 is showing the trends of RCA for Tanzania and RMA for Europe and Central Asia in goods where complementarity is found. The blue line shows the revealed export advantage for Tanzania while the red line shows the revealed import advantage for Europe and Central Asia.

Table 2: Trade Complementarity from Tanzania to Europe and Central Asia

Product	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Animal	ü	ü	ü	ü	ü	ü	ü	x	ü	ü
Food Products	ü	ü	ü	ü	ü	ü	ü	ü	ü	ü
Metals	x	ü	x	x	x	x	x	x	x	ü
Textiles and Clothing	ü	ü	ü	ü	ü	ü	x	x	ü	ü
Vegetable	ü	ü	ü	ü	ü	ü	ü	ü	x	x

9.2 Trade Complementarities from Europe and Central Asia to Tanzania

While Europe and Central Asia has revealed export advantage in 10 groups, Tanzania has revealed import advantage only on 7 groups: chemicals, fuels, metals, plastic or rubber, transportation, vegetables and woods. Table 4.3 shows these complementarities in yearly basis. Complementarity is found in all the goods that Tanzania has RMA on except for fuel for at least of some years. We found no complementarity in 2015 even though total imports have actually increased in that year. The import data show a decline in the goods of plastic or rubber and transportation and sharp increase in the importation of fuel. Fuels accounted for about 50% of imports in 2015, however Europe and Central Asia have not revealed export advantage on fuel hence lack of complementarity.

Table 3: Trade Complementarity from Europe and Central Asia to Tanzania

Product	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Chemicals	x	x	x	x	x	ü	x	ü	ü	ü
Fuels	x	x	x	x	x	x	x	x	x	x
Metals	ü	ü	x	ü	ü	ü	x	ü	ü	ü
Plastics or Rubber	ü	ü	ü	ü	ü	ü	x	ü	ü	ü
Transportation	ü	ü	ü	ü	ü	ü	x	ü	x	ü
Vegetables	x	x	x	x	x	x	x	x	x	x
Woods	x	x	x	x	x	x	x	ü	x	x

Items of plastic or rubber have revealed complementarity throughout the study except for 2015. These items consist of both intermediate and consumer goods. However, when the goods are divided based on the level of processing, we find complementarity for consumer goods in all years and for intermediate goods only for 2009,2010, 2014, 2016,2017 and 2018. The complementarity is more beneficial to Tanzania's industrialization when the imported goods are capital, raw materials or intermediate goods because they still provide a chance for processing. Another item that we find consistent complementarity is transportation, except

for 2015 and 2017. Items of transportation are aids to trade hence facilitate movement of goods either raw materials or finished goods, the service that is very crucial for industrialization.

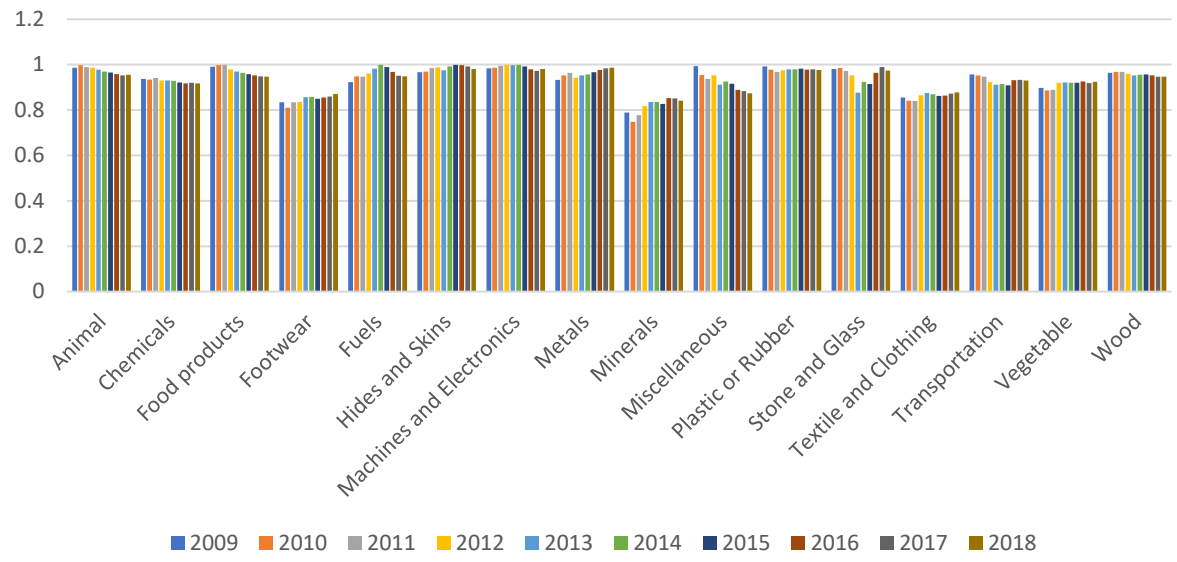
Chemicals, metals and woods are non-consumer goods, and they are helpful in the industrialization process. Metals have revealed complementarity in all years except for 2011 and 2015, due to lack of import advantage by Tanzania. Complementarity on chemicals has been revealed in the latest years of the study. Wood on other hand has complementarity only in 2016 because that is the only year Tanzania has import advantage in woods. Complementarity in these goods (chemicals, metals, and woods) is backed by consistent trade advantage on the side of Europe and Central Asia.

10. Trend of intra-industry trade for all goods in Tanzania and Europe

Figure 11 shows the trend of Grubel-Lloyd (GL) index indicating the intra-industry trade for Europe and Central Asia. The index ranges from 0 to 1 where 1 is presence very good intra industry trade, where imports and exports from the same industry are equal. And 0 is the lack of intra-industry trade, and the only trade present is inter-industry. Following Wang (2009), intra-industry trade is reported present when GL is 0.5 and above.

The GL for Europe and Central Asia has always been above 0.5 in all groups of goods in all years. This indicates presence of intra-industry trade in goods between Europe and Central Asia with the rest of the world. The GL has consistently been very close to 1 in animals, hides ad skin, machine and electronics, metals, rubber and plastic and wood. The rest range between 0.7 and 0.9, the minimum 0.7 is found in minerals in 2010. The trend of intra-industry trade in footwear is found to have an increasing trend.

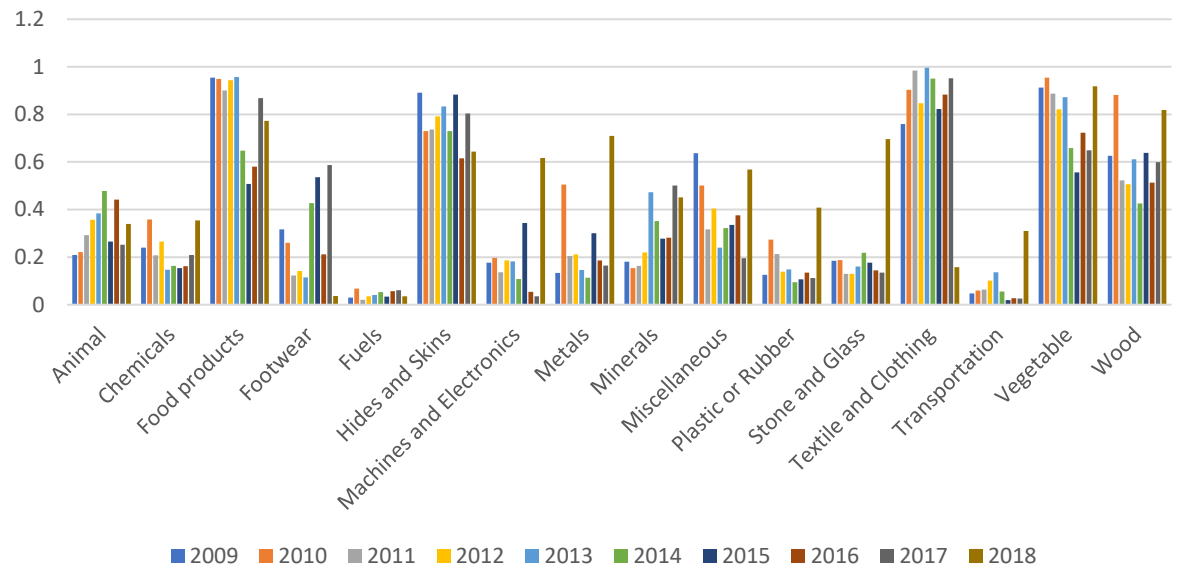
Figure 11: Trend of GL Europe and Central Asia



The trend of intra-industry trade in Tanzania is shown in the figure 12. Goods that consistently shown GL of greater than 0.5 are food products, hides and skin, vegetable, and wood. The GL for textile and clothing was greater than 0.5 except for 2018. Machines, metals, miscellaneous and stone and glass have revealed intra-industry trade in 2018. When we rank the averages of GL index for each product, we find textile and clothing ranks the first with average of 0.83 (0.9 when excluding 2018), followed by food products, vegetables and hides and skin.

Goods that are consistently below 0.5 are animals, chemicals, fuels, minerals, plastic or rubber and transportation. The average GL for these products has ranged between 0.04 for fuels and 0.3 for animals. The GL of below 0.5 means the country is either dominantly exports or dominantly imports the commodity. From the previous analysis, we see that lower GL value for animals and minerals are associated with more exports than imports. While those of chemicals, fuels, plastic or rubber and transportation is due to domination of imports.

Figure 12: Trends of intra-industry trade for Tanzania



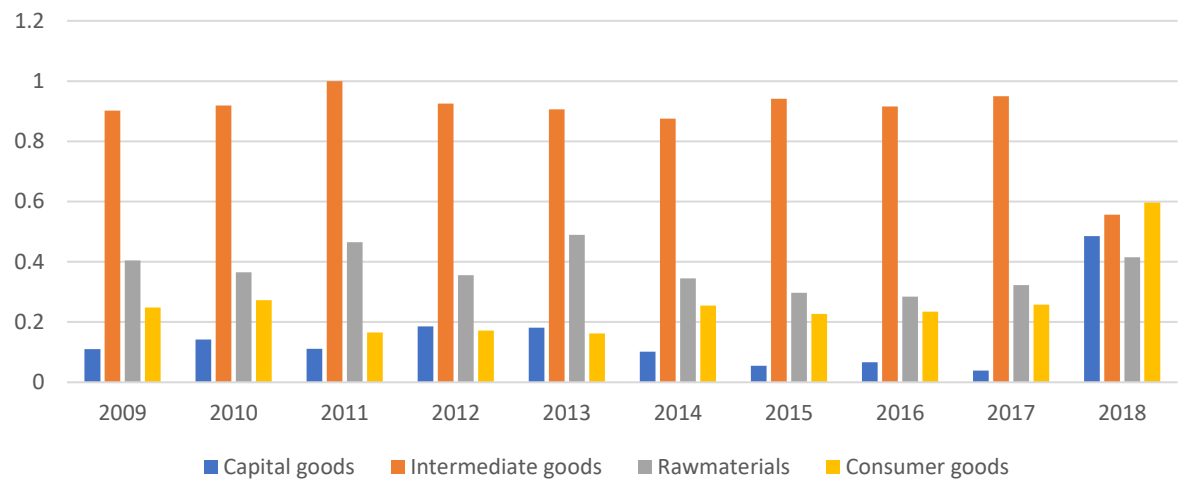
Presently, international trade focuses on intermediate goods at different stages of the production process in global value chains. Production processes have become distributed across the globe, with different regions and countries specializing on different phases of production research, design, intermediate inputs, semi-fabricated components, final assembly, marketing, post-sales services, and so forth.

Growth of industrialization is normally accompanied by trade of goods at different value chain, for example import of raw materials or semi-finished goods and export of finished goods. Figure 13 shows intra-industry trade between Tanzania and the rest of the world for goods classified based on their level of processing. We find the G-L index for intermediate goods is consistently above 0.5 and averaging at 0.89 (0.92 excluding 2018). We find substantial decline in 2018 due to decline in exports of intermediate goods which is the same issue for textile and clothing in the analysis above. Interesting that we find the export patterns of textile and clothing also resemble the export patterns of intermediate goods and that exports of textile and clothing used 21% of exports in intermediate goods in 2009. Even though the percentage declined, the pattern still remains similar except for 2017.

We also find increased intra-industry trade for consumer and capital goods. As a matter of fact, intra-industry trade only existed in intermediate goods prior to 2018. The G-L index for consumer goods is 0.59 while that of capital goods is 0.48, both these increases are due to

increased exports in capital and consumer goods. The G-L for raw materials remained below 0.5 throughout averaging at 0.37, this is due to exports dominating imports.

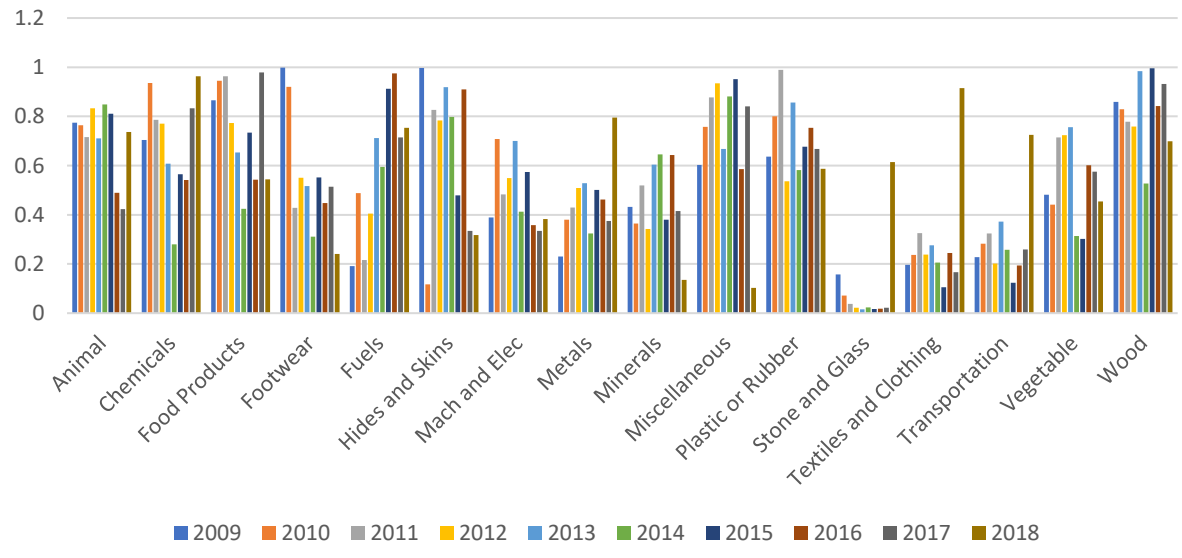
Figure 13: Intra Industry trade in Value chain in Tanzania



a. Intra-Industry Trade between Tanzania and Sub-Saharan Africa

Since we found very limited intra-industry trade from Tanzania with the rest of the world, we thought it will be useful to see how Tanzania performs with the rest of Sub-Saharan countries (SSA). Figure 14 shows the G-L indices for all classes of products from 2009 to 2018. Contrary to the previous analysis data used in this diagram consists of export and imports between Tanzania and Sub-Saharan countries (prior analysis used the trade data between Tanzania and the rest of the world).

Figure 14: Intra-industry trade between Tanzania and Sub-saharan countries



We find that contrary with the rest of the world, intra-industry trade existed for almost all products at different years. The goods that Tanzania had revealed intra-industry trade with the rest of the world also had G-L index of above 0.5 with SSA. Wood had record consistently above 0.5 throughout the research period with an average of 0.82, the highest being 0.995 in 2015 and lowest is 0.527 in 2014. Food products also showed presence of intra-industry trade for all years except in 2014. Vegetable and textile on the other had showed different results. With SSA intra-industry trade in vegetables was revealed in only 5 out of 10 years with an average of only 0.53. The G-L for textiles was less than 0.5 except for 2018. As a matter of fact, in 2018 other goods that had low G-L index with SSA also improved to above 0.5. These include metals, stone and glass, transportation and textile and clothing.

In addition, goods that Tanzania did not reveal intra-industry trade with the rest of the world has scored G-L of greater than 0.5 on average with SSA. Animals had average of 0.7 revealing IIT for all years except 2016 and 2017. Intra-industry trade was also found present in Chemicals and Plastic or rubber in all years (except 2014 for chemicals) with an average of 0.69 and 0.71 respectively. Intra-industry is also found in footwear, fuel, hides and skin and machines and electronics in different years. The intra-industry trade in hides and skin dropped significantly from 0.9 in 2016 to 0.3 in 2017 and 2018 due improvement in exports while importation remained also the same.

These results on presence of significant amount of intra-industry trade between Tanzania and Sub-Saharan countries and also within the Europe and Central Asia region confirm with found by Cabral et al (2013). They concluded that intra-industry trade increases between countries as the differences in their factor endowment decreases. That is to say countries with similar endowments like the sub-saran countries or European countries are more likely to engage in intra-industry trade as compared to trading between Tanzania and Europe.

11. Conclusion and Recommendations

The research aimed to show the trend on comparative advantage and intra-industry trade of Tanzania and Europe to determine the potential of trade opportunities between the two economies. Balasa index was used to determine comparative advantage then its robustness was measured using Volrath index to determine trade advantage. Complementarities in trade was done by comparing comparative export advantage and comparative import advantages

between the 2 economies. Grubel-Loyd index was used to measure presence of intra-industry trade.

Summary of Research Findings

Europe and Central Asia have revealed export advantage in animals, chemicals, food products, metals, plastic and rubber, transportation and wood with chemical products ranking no 1. Tanzania has consistently revealed export advantage on exports of animals, food products, stone and glass, textile and clothing and vegetables. Stone and glass always ranked the first followed by vegetables. Tanzanian exports are still dominated by primary products, mainly gold which accounts for more than 40% of total exports. The RCA of animals has shown a downward trend.

Europe and Central Asia is found to have strong and consistent revealed trade advantage on chemicals, metals and wood. While trade disadvantage is found on footwear, hides and skin, minerals, textile and clothing and vegetables. Meanwhile Tanzania shows continuous trade advantage in Stone and Glass, vegetables, minerals, animals, food products and hides and skin. Trade disadvantage is found in chemicals, footwear, fuels, machines and electronics, miscellaneous, plastic or rubber, transportation and wood.

Hence goods that Tanzania had revealed trade advantage while Europe had revealed trade disadvantage are hides and skins, minerals, stone and glass, textile and clothing and vegetables. On other hand, goods that Tanzania had revealed trade disadvantage while Europe had revealed trade advantage are chemicals, fuels, metals, miscellaneous and wood.

With the rest of the world Tanzania is in very early stage of industrialization as trade advantage, this evident with trade advantage in raw materials always and gained trade advantage in intermediate goods in 2012. The trade advantage gained in intermediate goods is highly associated with exports of textile and clothing. Trade disadvantage was continuously revealed in capital and consumer goods.

Complementarity from Tanzania to Europe is shown in animals, food products, vegetables, textiles and clothing and metals. There is already a good flow of exports of animals, food products, vegetables and metals from Tanzania to Europe, additional efforts are needed for

textile and clothing. In addition, Tanzania has trade advantage in hides and skin where Europe and Central Asia has trade disadvantage, thus is another area of complementarity.

Complementarity from Europe to Tanzania is found on rubber and plastic, transportation, chemicals, metals and wood. We also found complementarity for consumer goods in all years and for intermediate goods only for 6 out of 10 years. There was no complementarity in neither capital goods nor raw materials.

In the era of globalization, industrialization can also occur through participation in global value chain, this involves trade within the same industry (intra-industry trade). Intra-industry trade was found to be present in all goods in Europe with the lowest G-L index being 0.7 for minerals. As for Tanzania, intra – industry trade was found in textile and clothing, food products, hides and skin, vegetable and wood.

As robustness check we measured intra-industry trade between Tanzania and Sub-Saharan Africa and found that there exists intra-industry trade in all products including those it had no revealed comparative advantage like chemicals, plastic and rubber and hides and skin. The trend also showed improvement in 2018.

Have exports of Tanzania moved up the value chain?

Tanzania's exports still rely heavily on raw materials such as stone and glass, animals, vegetables. However, from 2012 onwards Tanzania has gained export advantage in intermediate goods. These intermediate exports are highly correlated with exports of textiles and clothing as well as processed vegetables. There is also opportunity of industrialization through processing of hides and skin as we have found trade advantage in this product, however efforts are still needed to achieve export advantage on this product.

Will free trade between Tanzania and Europe facilitate industrialization vision of Tanzania?

We find there are trade opportunities between Tanzania and Europe both in terms of exports and imports. North-south FTAs are known for their advantages in the form of knowledge and technology spill overs. There are export opportunities to Europe in processed goods such as food products, vegetables, textile and clothing and hides and skin. Tanzania also has an opportunity to export processed fish and animal products to Europe. All these are chances to industrial growth through widening the market. However, these industries need to be

developed to produce qualities and have reasonable operating cost to actually be able to penetrate European market.

In addition, we find import opportunities in rubber and plastic, transportation, chemical and woods. All these products can be used in the production process, hence removing of trade barriers will lower the cost of production for the local industries. Caution should be taken as we found opportunity to import consumer goods were higher than that of raw materials, capital and intermediate goods. Excessive imports of consumer goods may threat the newly established local manufacturers.

Is there opportunity for intra-industry trade between Tanzania and European countries?

Trade between Tanzania and Europe is found to be mostly related with comparative advantage of each side and is inter-industry. However, there are few opportunities of intra-industry trade in food products and in textile and clothing.

11.2 Recommendations

Tanzania is surrounded by waters and has people who are naturally livestock keepers. Efforts need to be taken to see that Tanzania maintains its comparative advantage in animal products. Since it is the source of living for many, but it seems that the sector is not commercialized enough probably due to the lack of enough proper infrastructure for storage and transportation.

The research shows there is opportunity of trade in hides and skin for Tanzania both to Europe and to the world, however the sector is still small to tap these opportunities. Efforts need to be taken to improve export of these products.

There is opportunity to export and expand our industries with Europe and Central Asia in products of textile and clothing and hides and skin. However, the internal business environment for these industries should be improved so that the products meet the quality of European markets.

The complementarity is found in intermediate and consumer goods. In a place where industrialization is still at infant stage and poor business environment strong competition on consumer goods may limit the progress of industrialization. Opening up on intermediate

goods on the other hand is beneficial in a way that Tanzania can get to process it raw materials and its finished products at lower cost, hence growth in industrialization.

Further research is recommended on detailed analysis of the goods that Tanzania can be more likely to import from Europe to determine at which stage of value chain they fall under. In addition, research can be undertaken to find out ways to improve textile and leather industry to capture the European market.

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