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The East African Community

An Export Diversification Opportunity?

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Abstract

This paper aims to answer the question whether the formation of the customs union within the East African Community (EAC) has led to a higher export diversification among its member states. Export diversification can reduce a country's vulnerability to price movements of exported goods and thus lead to a more stable economy. An evaluation of strategies aiming at generating a higher export diversification is therefore of interest and this paper focus on regional integration as such a strategy. To determine whether the EAC has led to a higher export diversification among its member states a fixed effect regression analysis has been carried out with the Herfindahl-Hirschman Index posing as a measurement of export diversification. The data consists of 40 different exporter-importer country pairs over the period 1995-2015. The study finds no support for the hypothesis that the EAC has led to an increased export diversification among its member states.

Conclusion: membership of the EAC customs union has not led to an increased diversification of exports to other member states within the community.

Key Words: Export diversification, EAC, HHI, Regional integration, Economic integration

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Abbreviations

Below follows a list of abbreviations that are used in the report.

EAC	East African Union
FTA	Free Trade Area/Agreement
GDP	Gross Domestic Product
HHI	Herfindahl-Hirschman Index
IMF	International Monetary Fund
PTA	Preferential Trade Area/Agreement
SITC	Standard International Trade Classification
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa

1 | Introduction

In 2000, The Economist labelled Africa as "the hopeless continent" due to decades of war, corruption and famines (The Economist, 2010). Sixteen years later, Africa is still home to some of the world's most underdeveloped countries. Measured by GDP per capita, 19 of the world's poorest countries are african (Business Insider, 2015) and problems with soft states, civil wars and famines are still very real. Much has however happened on the continent and an article titled "Business in Africa: 1.2 billion opportunities" from The Economist in 2016 conveys a brighter view of Africa's future. Many countries have experienced tremendous growth and living standards have improved while funds are being channeled into many parts of the continent. The article mentions that there are still reasons to worry and a major such is the dependency on a few kinds of commodities (The Economist, 2016).

A country highly dependent on export income from a small variety of commodities will be vulnerable to price shocks (Samen, 2010) with a potentially severe impact on the life of the country's inhabitants. For this reason, the concept of export diversification is of interest to people studying development economics since a more diverse export sector can lead to a more reliable source of income for the country. This point of view is a shift from the classic theories of Ricardo and Smith favouring specialisation rather than diversification (Samen, 2010).

Having established that a diversified export reduces a country's vulnerability to price shocks, the following question becomes what kind of measures lead to a higher export diversification. One hypothesis which has been previously studied, e.g. Melitz (2003), is that trade liberalisation will lead to a higher degree of export diversification. The logic is simple: remove taxes and tariffs and more types of goods can be competitive in the export market. Naturally, the removal of trade barriers can be expected to increase trade volume in general, but according to Melitz (2003) it will also increase export diversification. However, Melitz (2003) argues further that this might not be the case for countries involved mainly in exports of primary goods. For these countries, trade liberalisation can in fact decrease export diversification.

The link between regional integration and economic growth (UNECA, 2016) has led the African Union to pursue regional integration initiatives as a key strategy to promote economic development. Today the African Union consists of eight regional economic communities and these serves as a means to eventually reach a full African Economic Community through six

phases. The strategy is to first develop and strengthen regional integration initiatives which then will merge to form the "final" African Economic Community. Initially the scope of the integration areas is to stabilize tariffs and barriers, schedule their removal followed by their actual removal. Later phases are, among others, harmonization of monetary policies, free movement of persons and finally an african common market and parliament (UNECA, 2016).

The aim of this paper is to investigate which effect the creation of a regional integration area has on export diversification among the countries within the area. As previously indicated, export diversification can reduce a country's vulnerability and according to Bertinelli, Heinen, and Strobl (2009), considerable welfare gains can be achieved by moving to a more optimal export composition. The potential positive effects of export diversification and the strong focus on regional integration as a key strategy for African economic development opens up for interesting research regarding the relationship between trade liberalisation through regional integration initiatives and diversification of exports within the integration area.

This paper is a case study of the effects that the East African Community has had on export diversification among its member states. The EAC was first established in 1967, but dissolved ten years later in 1977. The community was however revived in 1999 by a treaty signed by Kenya, Uganda and Tanzania. Rwanda and Burundi joined the EAC in 2007 while EAC's newest member South Sudan joined in 2016. EAC is an interesting subject to study since it has passed the third stage of the six phased strategy laid out by the African Union. A free trade and customs union is since 2005 in place between Kenya, Tanzania and Uganda and since 2009 also Burundi and Rwanda (UNECA, 2016). This leaves eleven years worth of post-trade union export data for the first group of countries and six years for the remaining two countries. This data should be enough to determine if there is an observable trend towards export diversification as a result of the free trade union. Together with GDP data it will be used in a fixed effect regression model which should generate an answer to the question if the EAC customs union has lead to increased export diversification among its member states.

Table 1. Economic indicators and population for the EAC members in 2015. Data from UNCTADSTAT (2016).

Country	GDP $ Million	GDP per capita $	GDP growth %	Population Millions
Burundi	2 879	258	-2.66	11.18
Kenya	61 738	1 341	6.15	46.05
Rwanda	8 191	706	6.90	11.61
Tanzania	46 265	865	6.96	53.47
Uganda	24 490	627	5.63	39.03
EAC	143 563	890	-	161.34

There are large differences in economic status between the EAC members (table 1) with Burundi at the bottom with approximately a fifth of Kenya's GDP per capita which is the highest. The EAC members, with the exception of Burundi, have also experienced a high GDP growth during 2015.

The paper is structured as follows — first, theoretical and empirical aspects of export diversification are studied in chapter two of this paper. After this follows a chapter on the empirical approach of this paper where the regression model and the underlying data used to answer the research question are presented. The fourth part of the paper deals with the results of the study while part five draws conclusions from the results and sums up the paper.

2 | The Case for Export Diversification

It has been established that export diversification is a topic of interest when it comes to reducing the economic vulnerability of developing countries. In this chapter, the theoretical and empirical aspects of export diversification will be described. Benefits associated with, as well as studies of the drivers of, export diversification will be reviewed, with particular focus on economic liberalisation and regional integration efforts.

Exports can be increased through *the extensive margin of exports* by exporting new products to new or existing markets or exporting existing products to new markets. Exports can also be increased by exporting more of current products to existing export markets which is defined as *the intensive margin of exports*. Increased export diversification is equivalent to an increase in exports through the extensive margin. Export growth through the intensive margin is generally far more substantial than through the extensive margin. Developing countries have however a higher potential for export growth through the extensive margin since they tend to be less diversified both in terms of geography and products according to Amurgo-Pacheco and Pierola (2008).

In this paper, export diversification is measured on a bilateral level, and the most relevant part of the extensive margin could therefore be argued to be new products to existing markets, highlighted in green in the figure below. The reason for this is that trade exists between the studied countries in almost 95% of the observations. Amurgo-Pacheco and Pierola (2008) defines the new market dimension on an industry level with the argument that there exists no such thing as exports of a country, but that exporters are companies in different sectors. This is a reasonable distinction, but for the purpose of this paper where no further focus is put on the type of export diversification it is not important. The index used in this paper will not distinguish between the different types of export diversification and focus is only put on the number of exported product groups and their share of total exports. The index, which will be discussed more thoroughly under "Measuring Export Diversification", does therefore in fact also take the composition of the intensive margin into account when measuring export diversification.
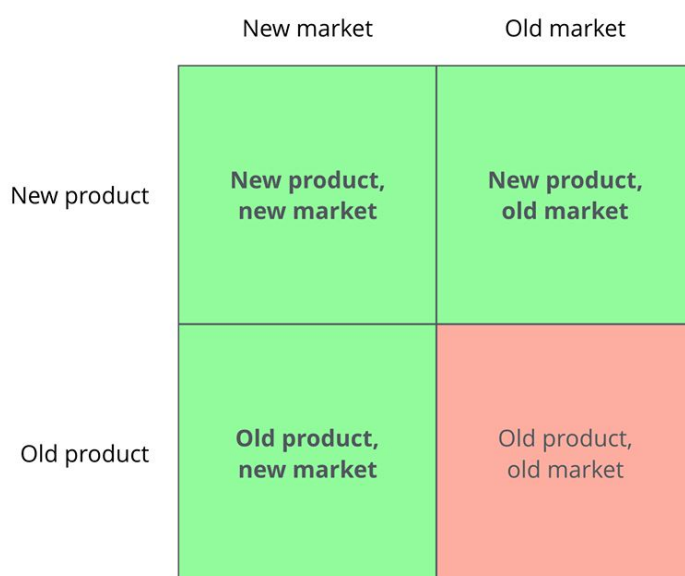
	New market	Old market
New product	**New product, new market**	**New product, old market**
Old product	**Old product, new market**	Old product, old market

Figure 1. The dimensions of an increase in exports volume. The green area covers the extensive margin while the red area covers the intensive margin.

2.1 Why Diversify?

Export diversification can be viewed as a relatively new area of interest since classic trade theory only favours specialisation. According to Samen (2010) it was first in the 1950's when R. Presbish and H.W. Singer suggested that too much export specialisation may trap a developing country in exports of primary products and imports of secondary and tertiary products, that export diversification became a topic of discussion. Love (1979) applied modern portfolio theory to quantify the potential export diversification benefits for a country. His conclusion is that while there is an optimal level of export diversification associated with economic stability, there is a cost in terms of lost earnings. Another argument for diversification is that agents can have preferences such that the structure of demand changes when income grows. This change can lead to an increasing diversity of goods demanded. In a closed economy this would generate an increased diversification of production in the economy according to Imbs and Wacziarg (2003). Although the assumption of a closed economy is incorrect for the case studied in this paper, it is not unlikely that imperfect market conditions on the global market will be sufficient as a driver for increased diversification within the economy due to a change of consumer preferences.

It has been stressed that one reason for why export diversification is desirable is the fact that a more diversified export reduces a country's vulnerability to external shocks such as commodity price volatility. Shocks can however also be of internal nature and examples of this can according to Alemu (2016) be droughts, floods and political instability . Furthermore, Brenton, Newfarmer and Walkenhorst (2007) states that a widely accepted view is that export diversification is an important trade objective when aiming for a sustained economic growth.

How exactly a country should strive towards a more diversified export is debated. As suggested by Love (1979), there can be a cost associated with reaching a more diversified export mix. Ofa et al. (2012) compiles arguments for export diversification through differentiation of products for which the country already has a comparative advantage rather than focusing on completely new products. Klinger and Lederman (2006) and Cadot, Carrere and Strauss-Khan (2011) takes a more moderate stand suggesting that African countries should pursue new export activities, but in industries where they already have a certain level of expertise.

To summarize, export diversification can help developing countries to reduce the risks associated with exports of a small variety of goods.

2.2 Drivers of Export Diversification

Melitz (2003) suggests that trade liberalisation can stimulate export diversification due to a higher number of exporters in sectors benefiting from cheaper access to new markets. The opposite might however be the case in economies with exports mainly in primary commodities, where the Heckscher-Ohlin model predicts that the increased profitability in traditional sectors can have a negative impact on the country's export diversification. Consequently, the effect that free trade has on export diversification is not univocally determined according to Melitz (2003).

Agosin, Alvarez and Bravo-Ortega (2012) finds evidence that trade openness leads to specialisation and not diversification of exports. This effect is however less accentuated in countries with high supply of human capital. It is important to note that trade liberalisation in the above case is an index of general trade liberalisation and not directly comparable to the trade union within The East African Community relevant for this paper. These results stand in

contrast to the results of Amurgo-Pacheco and Pierola (2008) which indicates that entering into FTAs, and through the FTAs reducing trade costs, on average will increase export diversification. The results of Nicita and Rollo (2014) shows that trade tariffs have a significant, but not so large, impact on export diversification which provides an argument for a positive impact of regional trade agreements on export diversification. Further evidence for this thesis has been laid out by Foster, Poeschl and Stehrer (2011) whose results show that Preferential Trade Agreements (PTAs) have a positive impact on exports in general and exports on the extensive margin in particular. Dennis and Shepherd (2011) find strong support for the thesis that export costs, market entry costs and international transport costs have a negative impact on the export diversification of developing countries. Policies aimed at trade facilitation is therefore argued to be an important tool in promoting export diversification and reforms aiming at improving customs procedures demonstrate the most significant positive effect on export diversification. Dennis and Shepherd (2011) further argues that trade facilitation is a particularly good way of promoting export diversification since it in contrast to e.g. industrial policy does not pick winners in terms of specific industries or companies. Instead it contributes to diversification by helping "natural" winners on the home market succeed on other markets. Bonaglia and Fukasaku (2003) on their hand, argues that trade liberalisation by itself is insufficient as a means of boosting export volume and diversification since it can be undermined by the lack of reforms in other areas such as infrastructure.

Imbs and Wacziarg (2003) proposes that export diversification as a function of GDP per capita follows a U-shaped curve, with a diversification maximum in the bottom of the U. This means that up to a certain point, economic growth will induce export diversification. After this point, economic growth will instead lead to specialisation. It is argued that most African countries are at a level of economic development associated with the left side of the U-curve and economic growth will hence lead to increased diversification. The existence of the U-shape is also supported by the findings of Bebczuk and Berrettoni (2006).

Amurgo-Pacheco and Pierola (2007) finds evidence of a gravity pattern, where the size in terms of GDP of the importer has a positive impact on export diversification while the distance between the markets has a negative impact. These findings are supported by Agosin, Alvarez and Bravo-Ortega (2012) who find evidence that remote countries, from an economic distance perspective, tends to have a less diversified export than countries closer to economic centras.

To summarise it can be concluded that the existing empirical findings regarding what impact trade liberalisation has on export diversification is somewhat inconclusive. However, Agosin, Alvarez and Bravo-Ortega (2012) use a general trade openness index when they reach the conclusion that trade openness tend to reduce export diversification, while Amurgo-Pacheco and Pierola (2008) and Foster, Poeschl and Stehrer (2011) look at settings more similar to that of this study when they end up with the opposite conclusion. Furthermore, it seems that the empirical support for the positive impact that exporter and importer GDP have on export diversification is more coherent.

3 | Empirical Approach

This section presents the method used in the attempt to answer the research question treated in this paper. The chapter examines HHI as a measurement of export diversification and moves on to describe the regression model and dataset used for the study.

3.1 Measuring Export Diversification

Export diversification can be measured through different techniques focusing on different aspects of the export composition. One way is to simply count the number of products or product groups exported while another one is to use some sort of concentration index.

A commonly used measure of export diversification is HHI according to Alemu (2016). The index is used for this purpose in several of the studies referred to in this paper such as Agosin, Alvarez and Bravo-Ortega (2012), Chandra, Boccardo and Osorio (2007) and Cadot, Carrere and Strauss-Khan (2011). Sometimes a normalised version of HHI is used, but this paper will not use this normalised form since it puts more focus on the equality of distributions by yielding a value of zero as long as all market shares are of equal size - regardless of the total number of commodities. Instead the regular HHI definition which is treated below, will be used. The index, which often is used as an estimation of the market concentration within a specific industry, is defined as the sum of the squared market share of each firm in the industry. This means that the maximum value for the index is 1 since an industry with only one firm yields this value. A highly disaggregated market however will result in indexes approaching zero. Below, the mathematical formula for the HHI is presented.

$$HHI_{ijt} = \sum_{k=1}^{n} \left(\frac{Xijt_k}{Xijt}\right)^2$$

Where HHI_{ijt} is the HHI for country **i**'s exports to country **j** year **t** and $Xijt_k$ is the export value of commodity group **k** from country **i** to country **j** and $Xijt$ is the total value of country **i**'s exports to country **j** year **t**.

Since this paper does not focus on which type of export diversification in terms of the extensive margin, HHI is a relevant measure of the diversification/disaggregation of exports to a specific market. The reason for this is that HHI not only takes the absolute number of products or product groups into account when measuring export diversification, but also

weights in the relative share of total exports for a product or product group. The strength of this measure can be exemplified by a market with 100 products where one of these accounts for 90% of total exports and the 99 remaining products account for an equally large share of the remaining 10% of exports. This yields a HHI of $0.9^2 + 99*(0.1/99)^2 = 0.81 + 0.01/99$ ~0.81 compared $100*(1/100)^2 = 0.01$ which would be the case if all exported products accounted for the same market share i.e. 1%. A flaw with the index is however that even if the number of exported products or product groups increase in absolute terms, the HHI can increase, signalling a lower export diversification, due to an even higher increase in exports on the intensive margin.

3.2 The Regression Model

To determine whether the EAC has led to an increased export diversification among its member states, a regression model has been put together. Since HHI is used as a proxy for export diversification, the calculated yearly HHI for exports from an EAC country to an export partner forms the dependant variable in the regression. The explanatory variable of main interest to the study is a dummy variable with value 1 if the exporting and importing country are EAC members and 0 otherwise. If the regression coefficient for this variable is significantly lower than 0, the hypothesis that the EAC leads to higher export diversification among its member states is confirmed. To rule out other causes for variations in export diversification more explanatory variables are included. As suggested in this paper, GDP can be expected to have a positive impact on export diversification and hence a negative effect on HHI and will therefore be included as an explanatory variable along with GDP of the importing country which is believed to have a similar effect on export diversification. Since GDP can be expected to grow exponentially, the GDP is linearized by taking the log of the original values before they are put in the regression. To rule out time effects as well as fixed effects between the countries, variables catching these potential effects should also included in the model. For this reason a fixed effect model has been used which should eliminate all effects caused by country pair specific reasons. Macro effects should be eliminated by the time variable. The regression model can be found below accompanied by a table explaining the variables.

$$HHI_{ijt} = \beta_0 + \beta_1 EAC_{ij} \times EAC_{ijt} + \beta_2 lnGDP_{it} + \beta_3 lnGDP_{jt} + FE_{ij} + \delta_t + \varepsilon_{ijt}$$

Table 2. Description of variables included in the regression model.

Variable	Description
HHI_{ijt}	Herfindahl-Hirschman index for country i's exports to country j at year t
EAC_{ij}	Dummy variable with value 1 if both country i and j are part of EAC and 0 otherwise
EAC_{ijt}	Dummy variable with value 1 if both country i and j are part of EAC at time t and 0 otherwise
$lnGDP_{it}$	Log of exporter i's GDP in billion $ at time t
$lnGDP_{jt}$	Log of importer j's GDP in billion $ at time t
FE_{ij}	Fixed effect between exporter i and importer j
δ_t	Time variable
ε_{ijt}	Error term

Three hypotheses are formed based on the existing theory and empirical results studied in this paper. All studied variables are expected to contribute to an increased diversification of exports for the country in question. Hence, the variables are expected to have a negative impact on the dependent variable HHI.

Table 3. Hypotheses for the value of the coefficients in the regression model.

Variable	β_x	Coefficient
$EAC_{ij} \times EAC_{ijt}$	β_1	< 0
$lnGDP_{it}$	β_2	< 0
$lnGDP_{jt}$	β_3	< 0

3.3 Data

Two sets of data have been used in this study. The first dataset is export data for the years 1995 to 2015 for all five EAC countries. This data comes from UNCTADSTAT which is the statistics pillar of the United Nations Conference on Trade and Development (UNCTAD). The export data is presented on a three digit level SITC, Rev.3 commodity classification, which in this case means that 263 different product categories are taken into account when calculating the HHI.

There is a trade off when it comes to the level of specification of exported goods since a too aggregated level fails to detect diversification within the product group, whereas a too specific product specification could suggest a higher diversification when there is no relevant difference between the products from a diversification perspective. The choice to use export data on a 3-digit level is due to this trade off as well as the fact that this data is provided by United Nations Conference on Trade and Development (UNCTAD).

The second dataset is GDP data for the studied countries during 1995-2015. The data is provided by IMF through the World Economic Outlook Database (IMF 2016). The GDP is measured in U.S. dollars and presented in current prices. Both GDP for the exporting country as well as the importing country will be included in the regression as explanatory variables.

The study covers five EAC countries exports to eight other countries over a 21 year period. This means that a total of 840 observations are included in the data. However, for 47 of these observations, no reported trade has taken place between the countries involved and therefore no HHI exists for these observations. Consequently, only 793 observations are possible to use in the regression. Burundi and Rwanda are the exporters in 41 of the 47 observations with no trade. It could therefore be argued that export diversification in terms of old products to new markets are relevant for Burundi and Rwanda when considering exports during a year following a year without exports, but the focus of this study is as previously stated not on which part of the extensive margin that generates an increased export diversification and no weight will therefore be put on this fact.

To be able to determine what effect that the EAC might have had on export diversification among its member states four control countries are added to the dataset. These four countries which are not members of the EAC are Egypt, Ethiopia, Nigeria and South Africa. These countries are among the largest economies in Africa and they are also geographically spread

around the EAC. The reason for choosing rather large economies is that this ought to ensure that imports from the EAC countries do exist for most years since this is necessary to be able to calculate the HHI. Ethiopia is a particularly interesting control country since it has a close geographical proximity as well as a similar size of the economy compared to Tanzania and Kenya.

3.4 Data Issues

Both export and GDP data are presented on a yearly basis which raises the question how to deal with EAC customs union membership effectuated in the middle of a year which is the case for Burundi and Rwanda. The two countries started applying the EAC custom union instruments in July 2009 (UNECA, 2016) and they have been labeled as EAC customs union members during this year in the regression model even though this only holds for the later half of the year. The reason for this is that if there is a membership effect on export diversification it should be able to influence the exports of 2009. Furthermore, since there are six more years worth of data after 2009, the weaker potential trend visible for 2009 should not affect the overall result of the regression to any greater extent.

Another data issue with a possibly higher impact on the final result is the unreliability of the input data. This can be portrayed by the fact that there always seems to be a discrepancy between declared exports from country i to country j and imports for country j from country i. See appendix for an example of this discrepancy.

A potential problem for the study could have been the fact that Burundi, Kenya, Rwanda and Uganda all are members of Common Market for Eastern and Southern Africa (COMESA) since also South Africa and Egypt are members - countries posing as control countries in this study. The customs union part of COMESA is however not yet in force and for this reason, membership of COMESA is not being accounted for in this paper. The same applies for IGAD - Intergovernmental Authority on Development where Ethiopia, Kenya and Uganda are members. A union with implemented free trade during the relevant period is however SADC - Southern African Development Community where Tanzania and South Africa have memberships. The FTA was implemented 2008 (UNECA, 2016), but since this only concerns one country pair it is unlikely to alter the results of the study to any higher extent.

4 | Results

The regression model does not use the HHI values in any aggregated form, but to visualize potential trends in HHI, average HHI for each country as well as the average for all studied countries are presented in the figure below.
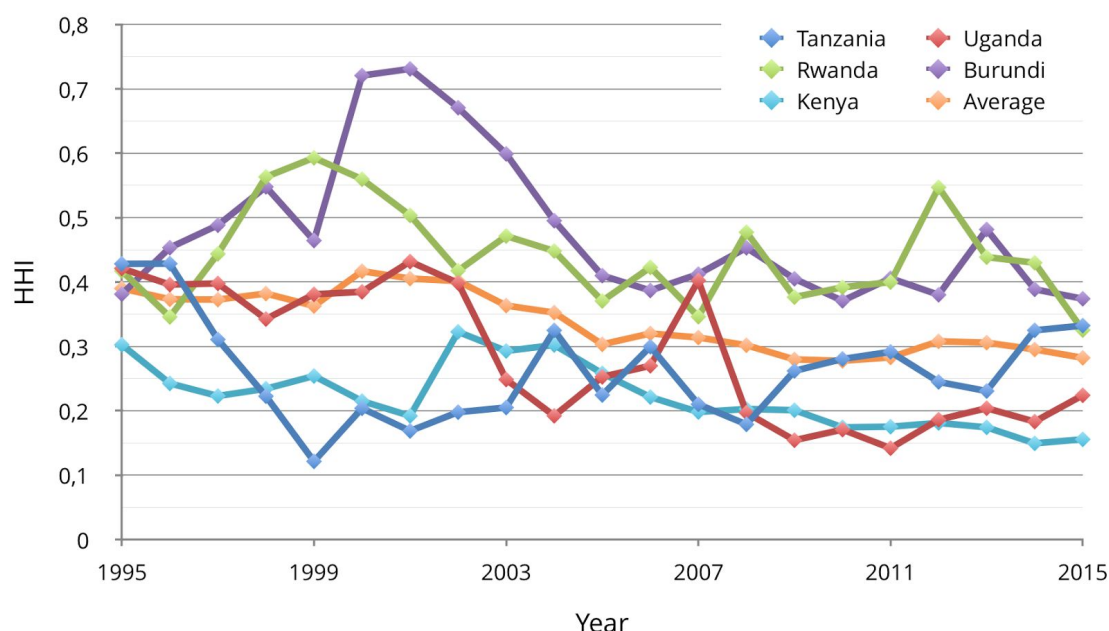

Figure 2. Average HHI of exports to the eight trade partners included in the study for each EAC member studied.

It is evident that there are country specific differences in HHI levels. Both Burundi and Rwanda lies clearly above the average while especially Kenya, but also Tanzania lies below the average (figure 2) . The fact that 41 of the 47 observations where no trade has been reported belongs to Burundi and Rwanda means that the HHI accuracy for Burundi and Rwanda could be argued to be lower than for the rest of the countries. For this reason, as well as the fact that post-customs union export data is more limited for these two countries, two regressions has been carried out. The first regression includes the whole dataset with 793 observations while the second one excludes observations concerning exports from Burundi and Rwanda and therefore includes 500 observations. The regression model is however exactly the same, the only difference is the range of the input data. While these two regressions are the only ones presented in the paper, further modelling has been performed as a sensitivity analysis. The alterations includes among others the exclusion of partner GDP as an explanatory variable and exclusion of Burundi and Rwanda completely. None of these

model alterations did however significantly change the outcome of the regressions presented below.

4.1 Regression 1

Table 4. Results from regression 1 including exports from all EAC members yielding a total of 793 observations. R^2=0.6227 and adjusted R^2 =0.5906.

β_x	Coefficient	Robust standard error	t	p-value	95% Confidence Interval
β_1 (EAC)	0.0069	0.0226	0.30	0.762	-0.0376 0.0513
β_2 (lnGDP)	-0.0727	0.0582	-1.25	0.212	-0.1870 0.0417
β_3 (lnGDP partner)	0.0717**	0.0365	1.97	0.049	0.0002 0.1433

* significant at 10%; ** significant at 5%; *** significant at 1%.

The coefficient for the product of the two EAC dummy variables, here summarized as "EAC", is estimated to be close to zero (Table 4). This indicates that EAC membership has had no impact on its member states' diversification of exports to other member states. The high p-value of 0.762 indicates that there is no reasonable level of significance for which the coefficient for EAC is different from zero. Consequently, regression 1 provides no evidence that supports the hypothesis that the EAC has increased export diversification, measured in HHI, among its member states.

The second explanatory variable lnGDP (the log of the exporting country's GDP) is also not statistically different from zero since the confidence interval encloses zero and the p-value is 0.212 . Even though it can not be determined on a satisfactory confidence level, using a 25% confidence level would in fact be enough to say that the variable lnGDP has a negative impact on the dependent variable. Consequently, regression 1 provides a weak indication that supports the hypothesis that GDP of the exporting country has a positive impact on export diversification, measured in HHI.

The third explanatory variable lnGDP partner (the log of the importing country's GDP) is the sole explanatory variable whose impact on the dependant variable can be statistically determined to be different from zero on a satisfactory level of significance (5%-level). The coefficient of 0.07 suggest that a higher GDP of the importing country will have a positive effect on the exporting country's HHI and thus a negative impact on the export diversification. Consequently, regression 1 provides evidence that contradicts the hypothesis that GDP of the importing country has a positive impact on export diversification, measured in HHI. Hence, the results of this study suggests that the GDP of the importer in fact has a negative impact on the exporting country's export diversification.

4.2 Regression 2

Burundi and Rwanda have a significantly higher HHI on their exports than the three initial members of the customs union, i.e. Kenya, Tanzania and Uganda. For this reason as well as those described earlier, a regression without Burundi and Rwanda as exporting countries has been performed to determine if the existence of these two countries contribute to the inconclusiveness of the regression result. The result after excluding these countries, which is presented below, does however not differ significantly from the previous results. The difference is mainly that the effect of lnGDP becomes significant at a 1%-level. This means that GDP growth seems to have a stronger influence on export diversification among the original customs union members than for Burundi and Rwanda.

Table 5. Results from regression 2 including only the exports of Kenya, Tanzania and Uganda yielding a total of 500 observations. R^2= 0.6604 and adjusted R^2=0.6259.

β_x	Coefficient	Robust standard error	t	p-value	95% Confidence Interval
β_1 (EAC)	-0.0140	0.0233	-0.60	0.547	-0.0599 0.0318
β_2 (lnGDP)	-0.2024***	0.0741	-2.73	0.007	-0.3479 -0.0569
β_3 (lnGDP partner)	0 .0936**	0 .0402	2.33	0.020	0.0146 0.1725

* significant at 10%; ** significant at 5%; *** significant at 1%.

In regression 2, the sign of the coefficient for the EAC variable is negative which was presumed in the hypothesis. The result is however still not significant and consequently, regression 2 provides no evidence that supports the hypothesis that the EAC has increased export diversification, measured in HHI, among its original member states.

The second explanatory variable, lnGDP, is significant in this regression with a p-value of 0.007. Consequently, regression 2 provides strong evidence that supports the hypothesis that GDP of the exporting country has a positive impact on export diversification, measured in HHI, among the original members of EAC.

The third explanatory variable, lnGDP partner, is significant in this regression as well with a p-value of 0.02. Consequently, regression 2 provides evidence that contradicts the hypothesis that GDP of the importing country has a positive impact on export diversification, measured in HHI. Hence, the results of this study suggests that the GDP of the importer in fact has a negative impact on the exporting country's export diversification among the original members of EAC.

The R^2 and adjusted R^2 of the second regression is slightly higher than that of the first one which indicates that the explanatory power increases when excluding the exports of Burundi and Rwanda from the dataset.

Table 6. Hypotheses and outcome for the value of the coefficients in the regression model.

Variable	β_x	Coefficient	Regression 1	Regression 2
$EAC_{ij} \times EAC_{ijt}$	β_1	< 0	Rejected	Rejected
$lnGDP_{it}$	β_2	< 0	Rejected	Not rejected
$lnGDP_{jt}$	β_3	< 0	Rejected	Rejected

5 | Conclusion

This paper seeks the answer to the question if membership in the EAC customs union has led to a higher degree of export diversification among its member states (hypothesis 1). To the author's knowledge there has been no prior attempt to shed light on this question and the ambition was therefore that the results of this study would bring more knowledge to the relationship between regional trade liberalisation and export diversification. The result indicates that there has been no change in export diversification as a result of the EAC customs union. Previous studies have suggested different implications on export diversification for countries opening up their trade, and it is therefore maybe not that surprising that the results of this study is inconclusive. It can not be ruled out that there are effects which have not been included in the used regression model which have an impact on the dependent variable. The use of a model which accounts for fixed effects between countries as well as time effects should however be a strong measure to reduce these potentially unaccounted for effects.

The results of this paper are based on 3-digit level export data which includes 263 product categories. This means that the calculated HHI fails to detect variations on a more detailed product level. It has been noted in the paper that there are arguments for export diversification through finer variations of existing products rather than completely new products. It has also been determined that a too detailed product specification can lead to conclusions of increased diversification when it in fact is just a minor difference between the products in question. Another suggestion for further studies is therefore to study the EAC's implication on export diversification with export data on a higher digit level since this paper has used data on a relatively low digit, and thus highly aggregated, level.

Theories regarding the relationship between GDP and export diversification has been studied in this paper, and the hypotheses based on these were that both exporter (hypothesis 2) and importer (hypothesis 3) GDP would have a positive impact on export diversification. Regression 2, where only exports of the original EAC members are included, gives support for hypothesis 2 while regression 1 fails to do so. Hypothesis 3 is however rejected in both regressions and GDP of the importer does in fact have a statistically significant negative impact on export diversification.

A possible explanation for why a higher importer GDP would reduce the diversification of imports (exports from the exporting country) is that the higher output of the importing

country might mean that diversification within the country increases, reducing the need for diversified imports. Another explanation could be that as the importing country gets richer it might tend to increase imports from more developed countries rather than neighbours with similar levels of economic development. This is however an area which needs to be further studied to be able to draw any real conclusions.

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7 | Appendix

Merchandise trade matrix – detailed products, imports in thousands of dollars, annual, 1995-2015

Other: ECONOMY - Kenya | PARTNER - United Republic of Tanzania

PRODUCT / YEAR	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
[TOTAL] Total all products	(5) 18 669	(5) 13 668	(5) 19 709	(5) 20 074	(5) 25 787	(5) 22 818	(5) 20 522	(5) 22 919	(5) 31 763	(5) 39 874	(5) 45 247
[001] Live animals other than animals of division 03	(5) 48	..	(5) 95	(5) 8	(5) 16	..	(5) 3	(5) 26	(5) 4	(5) 1	(5) 3
[011] Meat of bovine animals, fresh, chilled or frozen	..	..	..	..	..	..	..	(5) 0	..	..	..
[012] Other meat and edible meat offal	..	..	(5) 23	(5) 21	(5) 1	(5) 204	(5) 415	(5) 5	..	..	..
[016] Meat, edible meat offal, salted, dried; flours, meals	..	..	..	..	..	(5) 19	(5) 2	..	..	..	..
[017] Meat, edible meat offal, prepared, preserved, n.e.s.	..	..	(5) 83	..	(5) 11	..	..	(5) 2	..	..	..
[022] Milk, cream and milk products (excluding butter, cheese)	..	..	..	(5) 179	(5) 12	(5) 114	(5) 27	(5) 8	(5) 5	(5) 1	(5) 47
[023] Butter and other fats and oils derived from milk	..	..	..	..	..	..	..	..	..	..	..

Merchandise trade matrix – detailed products, exports in thousands of dollars, annual, 1995-2015

Other: ECONOMY - United Republic of Tanzania | PARTNER - Kenya

PRODUCT / YEAR	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
[TOTAL] Total all products	(5) 27 538	(5) 31 478	(5) 21 896	(5) 18 136	(5) 21 492	(5) 21 020	(5) 22 834	(5) 23 947	(5) 35 122	(5) 44 487	(5) 51 652
[001] Live animals other than animals of division 03	(5) 133	(5) 152	(5) 105	(5) 7	(5) 13	..	(5) 3	(5) 27	(5) 4	(5) 1	(5) 4
[011] Meat of bovine animals, fresh, chilled or frozen	..	..	..	..	..	..	..	(5) 0	..	..	..
[012] Other meat and edible meat offal	(5) 16	(5) 18	(5) 25	(5) 19	(5) 1	(5) 188	(5) 462	(5) 5	..	..	..
[016] Meat, edible meat offal, salted, dried; flours, meals	..	..	..	..	..	(5) 17	(5) 2	..	..	..	..
[017] Meat, edible meat offal, prepared, preserved, n.e.s.	(5) 48	(5) 55	(5) 92	..	(5) 9	..	..	(5) 2	..	..	..
[022] Milk, cream and milk products (excluding butter, cheese)	..	..	..	(5) 162	(5) 10	(5) 105	(5) 30	(5) 8	(5) 6	(5) 2	(5) 54
[023] Butter and other fats and oils derived from milk	..	..	..	..	..	..	..	..	..	..	..

Appendix figure 1. Extracts from UNCTADSTAT pointing out the discrepancy between Kenya's reported imports from Tanzania and Tanzania's reported exports to Kenya. This is an example and not a unique phenomena for trade between Kenya and Tanzania.