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A country study of trade performance and of trade linkages: the case of Rwanda

UTANGANA, Yves

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Advanced Master in International and Development Economics

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**A COUNTRY STUDY OF TRADE PERFORMANCE AND TRADE
LINKAGES : THE CASE OF RWANDA**

UTANGANA Yves

Promoter: Professor Alain DE CROMBRUGGHE
Tutor: Stéphanie WEYNANTS

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List of Abbreviations

AFDB	African Development Bank
CAD	Current Account Deficit
EAC	East African Community
EDPRS	Economic Development and Poverty Reduction Strategy
EU	European Union
FDI	Foreign Direct Investment
FTZ	Free Trade Zone
GDP	Gros Domestic Product
HHI	Herfindhal-Hirschman Index
ISI	Import Substitution Industrialization
OECD	Organization for Economic Cooperation and Development
RCA	Revealed Comparative Advantage
ROW	Rest of the World
SSA	Sub-Saharan Africa
UNCTAD	United Nation Conference on Trade and Development
WDI	World Development Indicator
WITS	World Integreted Trade Solution

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Section 1 INTRODUCTION

Rwanda is a low income and landlocked country, located in the sub-Saharan and the Central-East African region. It shares boundaries with the United Republic of Tanzania in its East; Democratic Republic of Congo in its West; Republic of Burundi in its South and Republic of Uganda in its North. Rwanda occupies a total surface area of km² 26,338 (including km² 2,120 of area under water and swamps) with a total population of 11,809,295.¹ Rwanda in its vision 2020 aspirations envisaged to transform its economy into a middle income economy (attain per capita income of about USD900 per year) by shifting from a subsistence agriculture based economy to a knowledge based economy with a high level of savings and private investments in the light of reducing county's dependence on external aid².

Nevertheless, Rwanda is counting too much on the agricultural sector. This sector is a key source of employment and exports; agriculture employs over 70 per cent of the country labor force. Rwanda has one of the highest numbers of Fair Trade certified coffee producer organizations in Africa³. They also produce tea that are sold in the region, especially in Kenya due to the tea auction. The country did not depend only on the agricultural sector but also on the mineral sector that also remain among the high for the country. Moreover, it is important to note that Rwanda experiences a steady economic growth since the inception of vision 2020. Indeed, the country's per capita income increased from USD 719 in 2014 to USD 720 in 2015¹.

The history of cooperation in the east African region can be traced as far back as 1967, the EAC , in its current format, was only established in 1999, following the signing of the Treaty Establishing the East African Community. It is composed of six states, three of which (Kenya, Uganda, Tanzania) were the founding partners, while Burundi, Rwanda joined in 2007 and South Sudan joined in april 2016. The objectives of the Community as set out in the Treaty include the progressive formation of a customs union, a common market, a monetary union and, ultimately, a political federation.

¹ NISR: National Institute of Statistic of Rwanda. Rwanda Statistical Yearbook; 2016

² Ministry of Finance and Economic Planning (MINECOFIN). Rwanda Vision 2020; 2000

³ Elder, Sara D., Hisham Zerriffi, and Philippe Le Billon. "Effects of fair trade certification on social capital: The case of Rwandan coffee producers." *World Development* 40, no. 11 (2012).

1.1 Research question

This study will focus on Rwanda's trade performance and linkages to see overall if Rwanda's trade liberalization has benefitted them or not. It will look at several indicators such as Laspeyres Index, Revealed Comparative Advantage (RCA) and Herfindahl-Hirschman Index (HHI). Using the Laspeyres Index, we will be able to determine the movements of the volume and prices of coffee, tea and tin ores. The RCA will show if Rwanda has improving comparative advantage years after their inclusion in trade agreements. The HHI will show if the country has more concentration or diversification of exports and imports commodities. Basically, we ask: how has trade liberalization changed the export and import structure of Rwanda and their competitiveness in coffee, tea and tin ores?

Given also the long run deficit of Rwanda, it is imperative to determine how they are able to finance it from 1985 to present times.

1.2 Data Source and Methodology

To answer these questions, we will refer to many data source like UNcomtrade, World Development Indicators (WDI), African Development Bank (AFDB), and World International Trade Statistic (WITS). Different indexes also will be used to analyze the context in our case like Laspeyres value and volume index, Herfindhal Index (HI), Openness index and Balassa Revealed Comparative Advantage.

To measure trade openness, the sum of exports and imports divided to the GDP per year was derived using the data from WDI. All these indices will be discussed in the section 3 with more explanation.

Furthermore, the data derived from UN Comtrade were manipulated to compute for the trade shares of the top export products and top import products. Each value of the top export product was divided to the total export value of Rwanda to get the trade share to total exports per year. Similarly, each value of the top import product was divided to the total import value of Rwanda to get the trade share to total imports per year. This was done for the period 1999-2015.

For the selected export commodities, coffee, tea and tin sector. Each one's share was computed to total exports as well using the same method as above using value and volume. Its share with EAC members was computed as well. To illustrate, in Rwanda's trade with Uganda, Rwanda's export

value of coffee to Uganda was divided to the total Rwandan coffee export value. It was done for the other trading partners in EAC, Burundi, Kenya and Tanzania, and then for the Rest of the world. The value for the rest of the world was derived from the total exports minus the trade with EAC partners. The ROW value might be overestimated if there are missing data from the EAC partners.

Section 2 Literature review

2.1 Trade theories

Tracing back the evolution of what today is recognized as the standard theory of international trade, one goes back to the years between 1776 and 1826, which respectively mark the publications of Adam Smith's (1776) "Wealth of Nations" and David Ricardo's "Principles of Economics" (1817). This work will be focus on the theory of free trade, trade liberalization in the respective field of industry and trade.

For Adam Smith, the high productivity of labor in civilized and thriving nations seems to have been the effect of the division of labor. International trade certainly pre-supposes the division of labor among different countries. The theory says that one country would have an absolute advantage over the other if it can produce same amount of goods with fewer resources. This principle was described in the context of international trade.

David Ricardo built a first theory of free trade in the continuation of Adam Smith's work "Industrial capitalism" in Ricardo's England was at a relatively advanced stage as compared to what it was in Smith's time, both with rapid growth of large-scale industries and captive markets in overseas colonies. Imports of wage goods (as it was the case for corn) had a special role by cheapening wage goods and hence labor cost for industries. Free trade, as opposed to the Mercantilist policies of protection, was championed both by Smith and by Ricardo as a route to achieve production efficiency at a global level. Ricardo's cost calculations, despite his concerns for the introduction of machinery on a large scale, were based on labor hours. Those labor hours were treated as a single homogeneous input (in a two commodity world) subject to constant costs. A country is having an incentive to trade with another as soon as he has a specialization in producing and exporting only those goods and services which it can produce more efficiently (at lower opportunity cost) than other goods and services (which it should import).

Indeed, a comparative advantage is sufficient to ensure mutually gainful trade across nations, warranting complete specialization in the specific commodity with a comparative advantage in terms of labor hours used per unit of output.

It has become a standard refrain in policy circles that expanded trade holds the key to prosperity for developing countries. According to this view, if the industrialized countries would eliminate their trade barriers, this would provide a basis for growth in developing countries, pulling hundreds of millions of people out of poverty. As it is emphasized in the "Global Economic Prospects" of the World Bank: "*A reduction in world barriers to trade could accelerate growth, provide stimulus to new forms of productivity-enhancing specialization, and lead to a more rapid pace of job creation and poverty reduction around the world*" (World Bank, 2000)⁴.

The evidence for this view is considerably less compelling than its proponents imply. While there are certainly reasons for believing that expanded trade can help to promote growth in developing countries, it is unlikely that trade liberalization, by itself, will qualitatively improve the plight of people in the developing world. In fact, there are plausible scenarios in which trade liberalization can actually lead to worse outcomes for developing countries.

Moreover, it is not clear that trade liberalization is the key to rapid growth and development. It is worth noting that the major success stories in the developing world have not followed a simple path of trade liberalization⁵. Indeed, there are several examples such as South Korea and Taiwan, which now have income levels comparable to the poorer industrialized countries but also countries that have more recently experienced accelerated growth rates, such as China and India. In all of these countries the government has played an important role in guiding the economy. This guidance has included subsidies and protection for favored industries and restrictions on capital flows, policies generally opposed by the leading proponents of trade liberalization. In many respects, the path of trade liberalization currently promoted by the World Bank and others can be seen as directly opposed to the development strategies that have proven most successful in the postwar period.

Throughout most of the fifties and sixties many Latin America governments adopted Import Substitution Industrialization (ISI) as their principal method to achieve economic growth and socio-

⁴ World Bank, *Global Economic Prospects and the Developing Countries 2002*, Washington, D.C., World Bank, 2002.

⁵ Weisbrot, Mark, and Dean Baker. "The relative impact of trade liberalization on developing countries." *Investigacion economica* (2003).

economic modernization. By the late Sixties many Latin American countries were taking measures to eliminate some of the grosser distortions which ISI had brought along. In a number of countries the tariff level was brought down (e. g., Brazil, Argentina)⁶. This was not done to encourage more imports, but to decrease the level of effective protection and monopoly profits and thus give an incentive to firms to rationalize their operations. The ISI failed in Latin America because of difficulties of implementing it in the small-scale economies. However for East Asian NICs (Hong Kong, Taiwan, South Korea, and Singapore) all four of the East Asian NICs pursued policies of outward-oriented industrialization in order to generate foreign exchange via manufactured exports. During the initial phase of export expansion, the rapid growth of these East Asian nations was founded on light, labor –intensive industries like textiles, garments, and consumer electronics. East Asian success is due to the vigor of private entrepreneurs operating in relatively open economies, and the “*developmental state*” theory, which holds that governments have been active players in the markets, able to influence the use of public and private resources in line with a vision of how the industrial structure of the country should be evolving.

2.2 Trade liberalization, Openness and Growth

While defenders of free trade based their argument on theories developed in the 18th and 19th century, it was not popular in the 20th century. Indeed, protectionist theories became dominant and for decades the majority of the developing countries implemented industrialization policies based on a very limited degree of international openness.

These policies, which came to be known as "import substitution industrialization (ISI)" strategies, had their origins in the thinking of Raúl Prebisch (1950) and Hans Singer (1950) and were based on two fundamental premises: (1) a secular deterioration in the international price of raw materials and commodities would result, in the absence of industrialization in the LDCs, in an ever-growing widening of the gap between rich and poor countries; and (2) in order to industrialize, the smaller countries required (temporary) assistance in the form of protection to the newly emerging manufacturing sector⁷. This reasoning was closely related to the infant industry argument for industrialization. Prebisch's ideas were particularly influential in Latin America, where as Secretary General of the United Nations Economic Commission for Latin America, he advised most

⁶ Baer, Werner. "Import substitution and industrialization in Latin America: experiences and interpretations." *Latin American Research Review* 7, no. 1 (1972).

⁷ E, Sebastian. "Openness, trade liberalization, and growth in developing countries." (1993).

politicians and policy makers.

During the 1950s, 1960s, and 1970s a large number of development economists embraced the protectionist view, and devoted enormous energy to design planning models that relied heavily on the import substitution ideas. However, even though the protectionist paradigm had become dominant, a small group of academics embarked, independently (Scitovsky and Scott 1970 and Balassa 1971)⁸, on major empirical investigations aimed at assessing the consequences of alternative trade regimes (Edwards 1993). Using different approaches, these researchers argued that there was abundant evidence suggesting that more open and outward oriented economies had outperformed those countries pursuing protectionism.

The obvious policy implication from this literature was that developing countries should move away from protectionist and restrictive trade practices and open their foreign trade sector.

This view, which was generally unpopular in development policy circles, slowly gained followers among academics. As new evidence was gathered, increasing numbers of skeptical analysts were persuaded by the free trade perspective. It was not until the late-1980s, however, that the protectionist influence on economic advisors and politicians began to cave in. There is little doubt that the debt crisis unleashed in 1982 played an important role in reshaping policy views regarding development strategies, growth policy and long-term growth.

In the 1980s economists dealing with poorer nations began to recommend, with increasing insistence, development strategies based on market oriented reforms that included as a fundamental component the reduction of trade barriers and the opening of international trade to foreign competition.

2.3 Empirical review

There is many studies conducted related to international trade, in this study we will assessed few of empirical evidences. (Kohler, M. & Thembeke. K) a major focus of research on trade policy reform relates to whether changes in global economic participation, brought about by such reform, provides for sustainable income growth in the countries concerned. The challenge for many African economies in this context is to improve their position in the global economy by upgrading their

⁸ They calculated effective rates of protection (ERP) in a score of developing countries and linked these to the countries' overall economic structure and performance.

export structures. The authors' empirical work suggests that export diversification is a critical first step in upgrading export structure in Sub-Saharan African (SSA) countries. The authors find that the knowledge gained from the export diversification process, along with technology spillovers associated with FDI flows, are important drivers. Furthermore, they find evidence of learning by doing productivity gains from SSA exporting activity. On the whole, the authors do not find that the rise of Asian driver economies poses a significant threat to SSA export sophistication. What is crucial to the further success of SSA countries' upgrading their export structure is government policy initiatives that prioritize the upgrading of infrastructure, human capital development and institutional reform. These efforts will ensure that SSA countries can realize real economic gains through improvements in their export structures rather than locking their economies into commodity dependence on the basis of their favorable natural resource endowments⁹.

Ferdous (2011) conducted a study on pattern and determinant of export diversification in East Asia by using the Herfindhal Index which measures exports specialization or concentration in a given country. Diversification will be constructed based on the most commonly used statistic for measuring export specialization/concentration that is the Herfindahl Index (also known as Herfindahl-Hirschman Index). This index takes values from 0 to 1, while higher value representing greater concentration/specialization. Herfindahl index use as the dependent variable to represent export specialization for the regression analysis. Economies in East Asia have been increasingly integrated since 1992. Therefore, Ferdous' research studies whether those economies have become more specialized or less specialized in their exports as a result¹⁰.

Utku. U and Dikel. S (2004) study the competitiveness and pattern of trade flows/trade specialization from Turkey to EU on sectoral levels. The research is mainly based on different measures of Revealed Comparative Advantage (RCA) measures (in addition to simple Balassa Index) to determine the competitiveness of Turkish products in the world and EU markets.

Vasiliki Pigka- Balanika¹¹, conducted the study by exploring the relationship between trade openness and economic growth using a sample of 71 developing countries over the period 1990-2005. On his study, Sub-Saharan Africa region does appear to be different, high natural barriers to

⁹ Kohler, Marcel, and Thembeke Khumalo. "Upgrading Export Structure In Sub-Saharan Africa." *The International Business & Economics Research Journal (Online)* 14, no. 2 (2015).

¹⁰ Ferdous, Farazi Binti. "Pattern and determinants of export diversification in East Asian economies." *International Proceedings of Economics Development and Research* 5 (2011).

¹¹ Pigka-Balanika, Vasiliki. "The Impact Of Trade Openness On Economic Growth." PhD diss., thesis. eur. nl

trade, export dependence on primary commodities and poor overland infrastructures to distant large markets can explain why increased trade openness does not contribute to economic growth.

Derosa and Roningen (2003) investigate the potential economic impacts of establishing Rwanda as a free trade zone (FTZ) where imports tariffs are zero. The applied analysis indicates the superiority of adopting an economy wide FTZ for economic welfare, exports, and employment, especially in agriculture.

Diop^a, Brenton^a and Asarkaya (2005)^b on their study based on information from household survey and a recent diagnostic study of constraints to trade in Rwanda. Results show that even if there is trade, the poor farmers in rural areas, are currently disconnected from markets and commercial activities by extremely high transport costs and by severe constraints on their ability to shift out of subsistence farming. They remain in poverty.

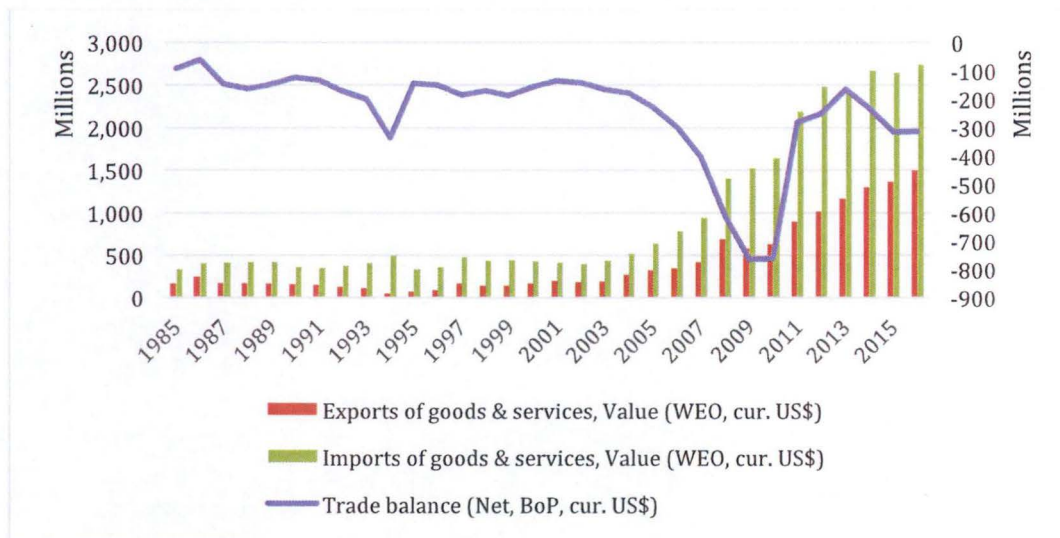
Section 3 Data analysis

A. Exports and Imports structure in Rwanda

To analyze the structure and pattern of trade in Rwanda, we will analyze time series data on exports, imports, balance of trade and these as share of GDP. In *Figure 3.1*, there is a long-term difference between import and export started in the year 1985. Country's economy suffered heavily during the 1994 Genocide, with widespread loss of life, failure to maintain the infrastructure, looting, and neglect of important cash crops. This caused a large drop in GDP and destroyed the country's ability to attract private and external investment. We can see the effects in the graph that imports increased and exports decreased. Rwandan businesses have been exploring other agriculturally-based exports that would be equally suited to the country's small farms, steep slopes, and cool climates. The feasibility of many of these new proposals to expand the agriculture industry is limited by the country's high transportation costs. In 2008, Rwanda trade deficit increase rapidly due to the global financial crisis and the worst inflationary shock i.e. the world oil and food price has increased. In 2009, the rise of the volume exported was required to mitigate the price fall which means, increase of productivity and competitiveness of tea and coffee and improving custom service especially for tourism. Exports and imports have increased significantly reflecting the level of economic activity although the imports value has been larger than export value. In 2010 was the worst trade balance for the country they reached that point due to the declined of coffee prices adding to that the persistent effect of the global financial crisis of 2008. In 2012 after aid shock, the government shift to public private partnership as a way of attracting more investors to strengthen the exporting

sectors. Also notably, the country's total import bill exceeds its aggregate export earnings by a wide margin. If imports are to stay at their current level (and expand with growth of the economy), the country must look increasingly to other sources to finance its import bill.

Figure 3.1 Trends of export, import and trade balance



Source: Africa Development Bank (AFDB)

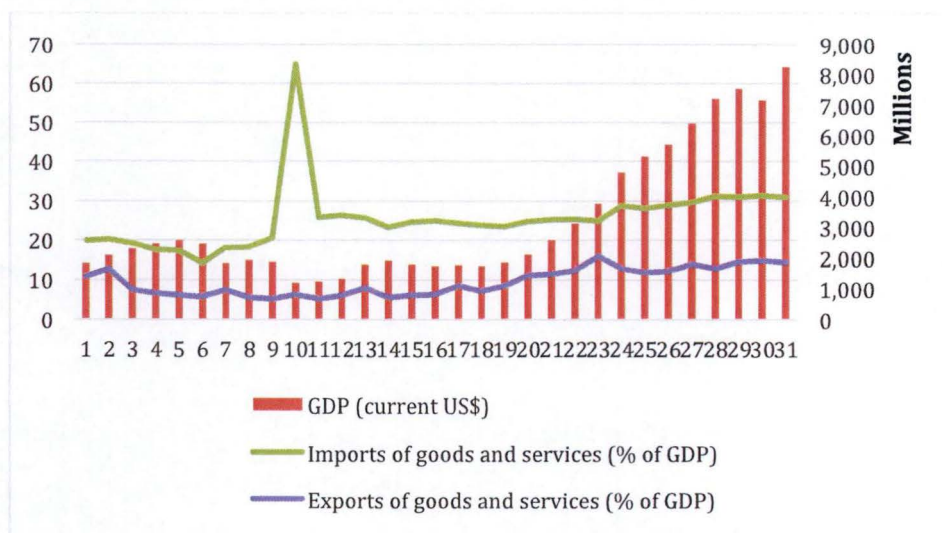
The **figure 3.2** shows that imports share to GDP is always greater than exports share which means that Rwanda has trade deficit in the period 1985 to 2015. The sharp increase of import share to GDP in 1994 is due to the massive imports of military equipment and drop in GDP. The long term gap between import and export which leads to a high long term trade deficit. After the political instability in 1994, the GDP increased sharply due to the increasing infrastructure investment (machinery and equipment in manufacturing sector) and foreign grants received between 1999 and 2001 accelerate the growth to 20% per year during this period¹² leading to the decline of the share of imports to GDP from its peak in 1994. Moreover, the appreciation of the currency due to the large inflow of grants increased exports and created more revenue. Overall, the official exchange rate shows depreciation from the period 1960 to 2015 (World bank, 2017). It makes exports less expensive and makes imports more expensive. This implies that there could be a problem of dutch disease which could have arisen from the consistent net importing situation of Rwanda which makes them use a lot of foreign exchange. Exporting sector loses from depreciation because of cheaper product in the international market such as coffee and tea etc. The exporting industries will reduce

¹² Diao, X., Bahigwa, G., & Pradesha, A., 2014. "The Role of Agriculture in the Fast-growing Rwandan Economy." IFPRI Discussion Paper 01363

their profitability which might have negative implication on employment and wages. Unfortunately, there is not much literature explaining the dutch disease in the case of Rwanda. Changes in exports and imports could not be fully attributed to changes in GDP as we see on the *figure 3.2*. The GDP is increasing continuously and there are no large fluctuations, it is almost growing at a constant rate.

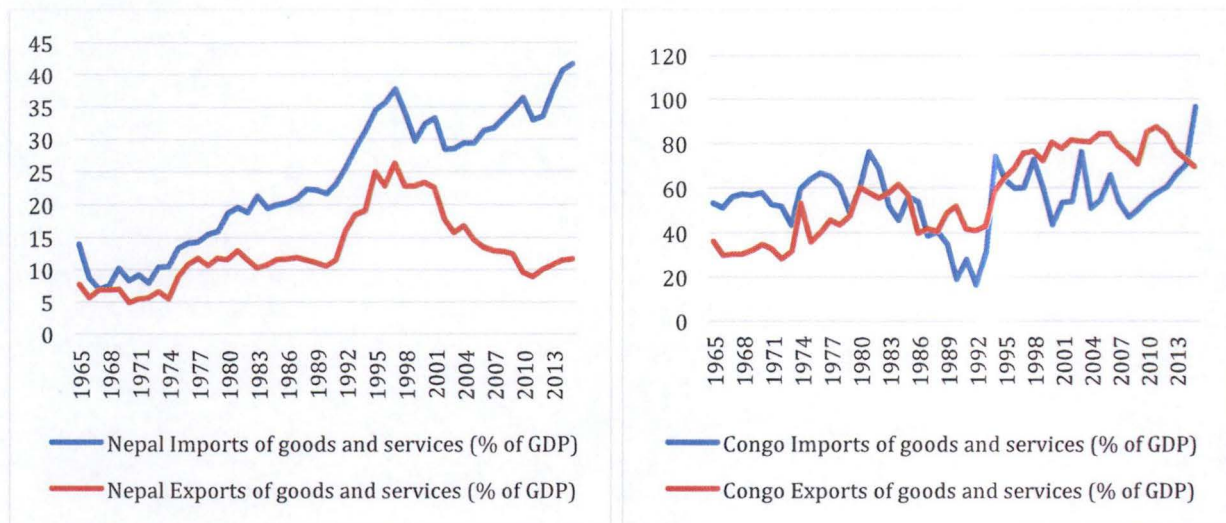
Rwanda’s economy has been the built up deficits on the country’s external account over the past 20 years due to either the aid grant to loan by international partners, Rwanda’s low level of export has led to the Rwandan currency depreciating against the US dollar and Climate change is another challenge to Rwanda’s economy that also requires huge capital for adaptation and mitigation. But the way forward the country is dealing with these challenges by trying to reduce aid, Rwanda will inevitably compensate for its fiscal shortfall by enforcing higher taxes to consumers and through borrowings. Also there is an initiative of the country to continu the promotion of exports and attract more FDI which is very low as we will see in the *figure 3.17*. However, the currency depreciated less in comparison to other EAC currencies over this long period. For that reason, the Rwandan Franc has remained competitive in the region. Overall, Rwanda has shown a strong growth in their economy with a boost in exports, better access and provision of health, education and stronger governance and debt management since the completion point of the HIPC (Heavily indebted poor countries) initiative which has an effect on the country to move away from being a primary goods exporter to an intermediate or final good producer.

Figure 3.2 Share of export and Import to GDP for Rwanda compared to other countries



Source: World development indicators, World Bank

Figures 3.2.1 Imports and exports of Nepal and Rép. Dem of Congo



Source: World bank data, 2017

The *figure 3.2.1* shows the imports and exports percentage of GDP of other low income countries like Nepal and Rép. Dem of Congo. For Nepal there is a long term trade deficit which have resulted from poor infrastructure and poor business doing environment fueled by lengthening political instability make Nepal rely on importing more¹³. For Congo another low income country they don't have a consistant trade deficit. The change in trends is due to the political instability for certain perdioid. Overall, the two countries experience political instability which affects the quality of infrastructure and makes for weak instutions. Similaryl, Rwanda experiences long term trade deificts because of the weakness of the production sectors brought about by the lack of efficient infrastructure.

The following tables contains data of the top export and top import commodities of Rwanda as of 2015. It shows the shares and composition of Rwanda's total trade for the period 1999-2015.

¹³ Lal Shanker Ghimire, "Nepal's Widening Trade Deficit", january 2016

Table 3.1 Share of exports value commodities

	Mineral fuels	Nobium tantalum vanadium zirconium ores, concentrates	Tin Ores	Tea	Coffee	Milling products, malts
1999	0.0%	7.3%	3.7%	25.7%	52.7%	0.0%
2001	67.7%	5.1%	1.2%	8.9%	8.0%	0.0%
2002	4.7%	26.8%	0.0%	No data	No data	0.0%
2003	6.7%	10.9%	2.8%	23.2%	27.1%	0.0%
2004	3.9%	5.9%	5.1%	15.1%	37.3%	0.2%
2005	3.3%	8.3%	15.4%	15.6%	24.8%	0.0%
2006	1.8%	7.8%	30.3%	17.7%	34.0%	0.0%
2007	0.6%	10.8%	12.2%	16.5%	17.7%	0.2%
2008	0.3%	9.4%	9.9%	31.3%	13.7%	0.5%
2009	0.2%	6.9%	30.7%	29.0%	12.7%	0.1%
2010	0.7%	8.4%	14.2%	14.2%	22.5%	0.3%
2011	5.1%	9.7%	16.7%	13.1%	18.8%	2.2%
2012	10.3%	11.2%	20.1%	17.1%	13.9%	4.9%
2013	11.9%	22.2%	8.7%	10.1%	8.2%	4.0%
2014	15.8%	15.8%	8.9%	8.8%	8.9%	4.8%
2015	14.9%	11.0%	12.4%	11.7%	10.7%	4.7%

Source: UN comtrade and own computation

In terms of value, we observe during 1999 coffee and tea were the major source of export revenue: coffee contributed to 52.7% of the total value of exports while tea contributed to 25.7%. In 2001, the coffee and tea export dropped drastically to reach only 8.9% and 8% respectively due to the falling of real coffee prices that make the country loses more revenue. In addition, world mining prices also declined for example tin ores¹⁴. The falling price of coffee, tea and mining sector could have been caused by the recession in USA in 2001¹⁵. In 2003 and 2006 both commodities recover from the fallen price coffee in international market. Changes in export revenue are due to the volatility of the export price of coffee and tea as well. On the other hand export commodities like mineral fuel, Nobium Tantalium vanadium zirconium ores increased tremendously in 2001 and 2002 contributed to 67.7% and to 26.8% of the total export revenue.

From 2003 up to 2011 there is a huge decrease of mineral fuels and Nobium tantalium vanadium zirconium ores due to the price negotiation between buyer and seller and so they are not published prices to compare too¹⁶. For the Tin ores commodity, during 2005 and 2006 there is a huge increase between 15% and 30% of earning, in 2007 and 2008 due to the financial crisis the drastically

¹⁴ <http://www.infomine.com/investment/metal-prices/tin/all/>

¹⁵ <http://www.incontext.indiana.edu/2002/nov-dec02/spotlight.asp>

¹⁶ Donald I. Bleiwas, John F. Papp, and Thomas R. Yager 'USGS', 2004.

decreased the volume exported declined but its price remained stable relative to the other top commodities and so its exports share remain high.

Table 3.2 Shares of total value of imports commodities

Year	Sugars and sugar confectionery	Salt, sulphur, earth, stone, plaster, lime and cement	Pharmaceutical products	Articles of iron or steel	Industrial, machinery, etc	Electrical, electronic equipment
1996	1.5%	1.9%	2.9%	1.4%	7.0%	4.1%
1997	3.2%	1.7%	3.6%	2.1%	5.0%	5.1%
1998	3.4%	2.4%	3.6%	1.8%	4.4%	3.3%
1999	3.4%	2.4%	2.7%	1.7%	4.7%	4.9%
2001	3.1%	2.3%	3.2%	1.5%	4.2%	10.4%
2002	2.4%	1.8%	5.4%	1.4%	8.6%	6.5%
2003	1.9%	2.6%	4.9%	2.4%	7.7%	8.4%
2004	1.5%	2.6%	6.8%	1.5%	7.9%	8.5%
2005	1.7%	3.4%	7.7%	2.9%	9.9%	10.1%
2006	2.2%	3.1%	6.1%	2.3%	7.8%	7.7%
2007	2.8%	4.6%	5.8%	3.1%	9.7%	9.4%
2008	1.8%	5.2%	4.5%	4.0%	10.5%	15.5%
2009	2.1%	4.1%	7.1%	4.0%	8.2%	16.0%
2010	3.2%	4.4%	4.7%	3.3%	9.4%	10.0%
2011	3.2%	5.1%	5.6%	3.5%	7.4%	9.9%
2012	3.6%	5.4%	4.2%	3.8%	10.2%	9.7%
2013	2.9%	5.1%	5.1%	3.4%	10.3%	9.5%
2014	3.2%	5.1%	5.0%	3.8%	9.2%	11.9%
2015	3.5%	5.6%	4.5%	3.9%	11.2%	12.2%

Source: UNcomtrade and own computation

The **table 3.2** reveals the country's dependency on imported capital goods because in some period imports of industrial machinery ranks first. The country's imports span a wide variety of products, especially manufactures, reflecting the paucity of manufacturing activity in Rwanda. Importing capital goods is important for increasing investment which in turn speeds up economic growth. By exporting primary commodities and importing capital goods, there is no expectation of positive trade balance since their prices have a significant difference. Rwanda imports a lot of electrical equipment knowing the government long term agenda is to move from an agriculture based economy to a knowledge based economy by 2020 (Visions 2020).

B. Price and Volume of major export commodities

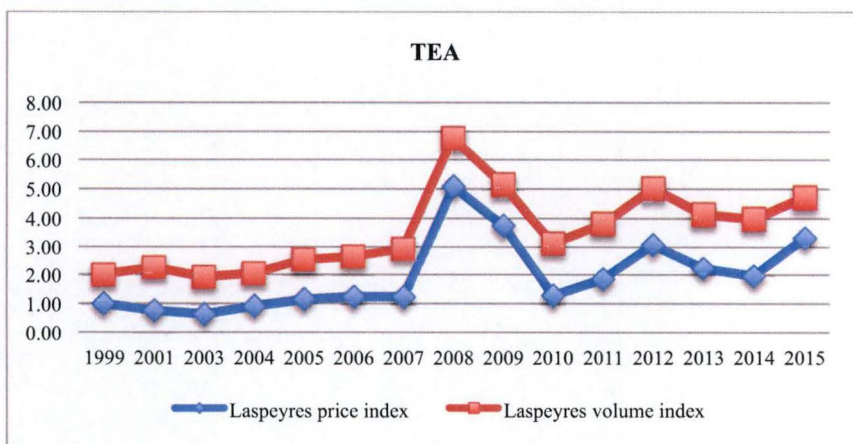
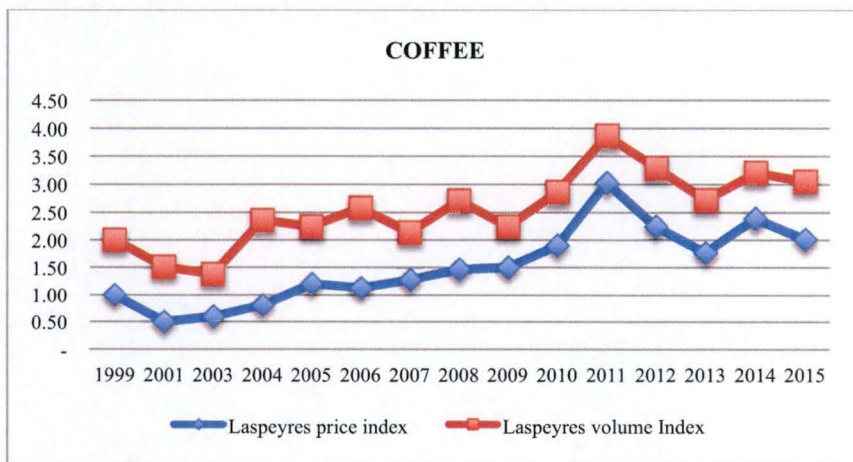
It is necessary to identify whether the incremental change of the export was due to the increase in price or volume of export commodities. Because, the increase in volume of export more than its price is a sign of increase in productivity and vice versa. To analyze the price in the study, we will derive the price per kg by dividing the value of the major commodities which are coffee, tea and tin ores with their respective volume. The method used to measure the indexes are Laspeyres price and volume indexes:

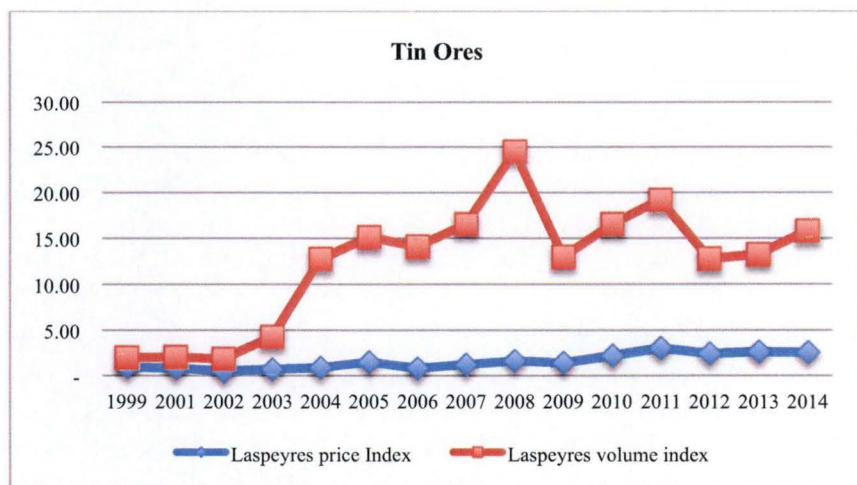
Equation 1:

$$\text{Laspeyres price Index} = \frac{\sum P_i Q_o}{\sum P_o Q_o} \quad \text{and volume index} = \frac{\sum P_o Q_i}{\sum P_o Q_o}$$

Where P_i and Q_i are price and volume of commodities respectively in each year; P_o and Q_o are price and volume of commodities in the base year, in this is 1999.

Figures 3.3 the price and volume of major export commodities





Source: UN comtradeSTAT and own computation

Based on this method, the results in *Figure 3.3* show that the price of coffee and tea products were increasing in the same trends with the volume. For the tin ores, it is increasing but with large volatility and the Laspeyres price index increases very slowly. We can say that there is productivity for coffee and tea which follow the trend of the price offered in the international market because of competitiveness. There is greater productivity because of the government effort's to improve the agriculture sector through their mid-term government goals.

C. Revealed Comparative advantage

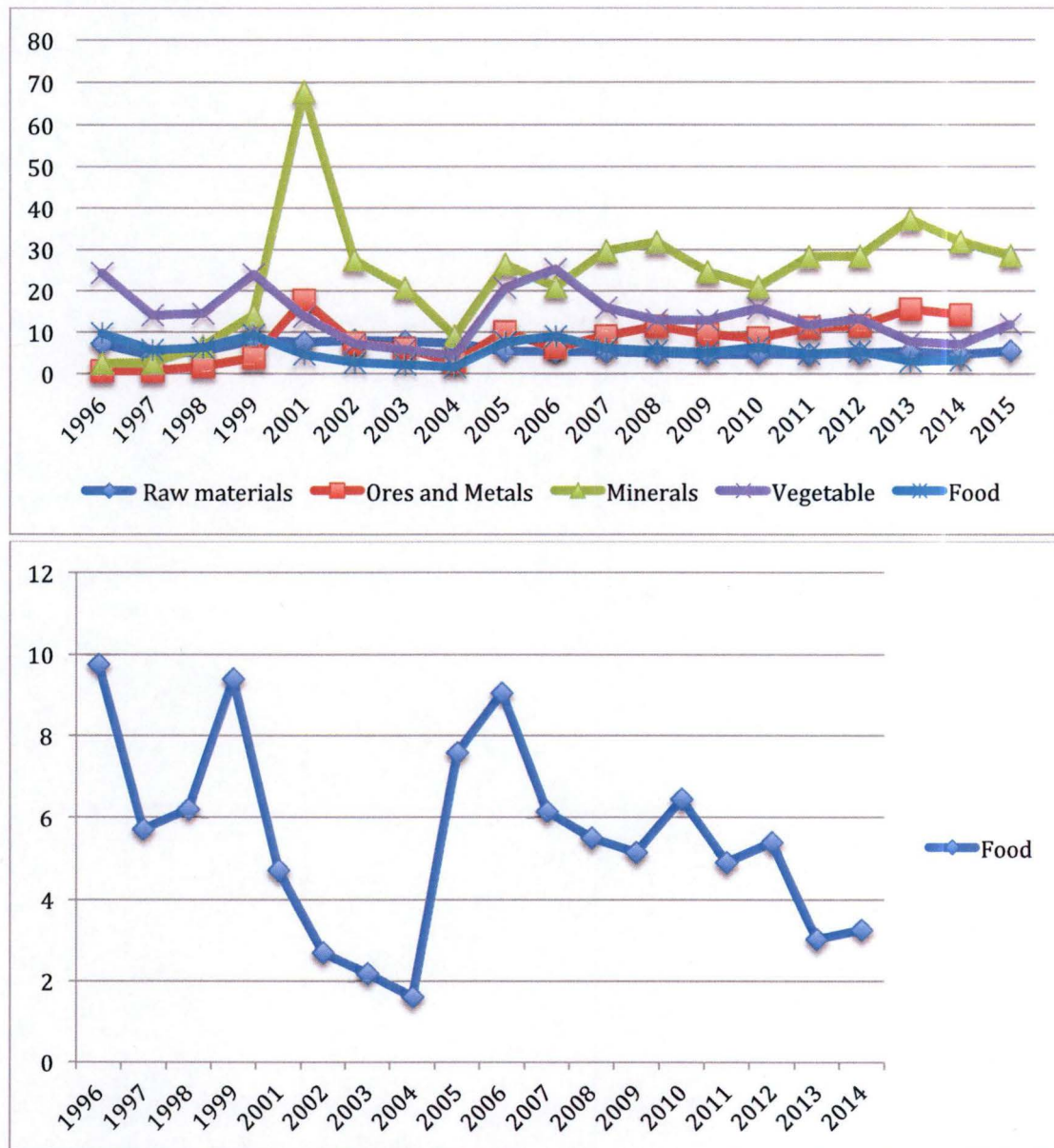
Seeing that Rwanda's top exported goods are mineral fuels, Niobium tantalum vanadium zirconium ores, concentrates milling products coffee, tea and tin ores, it would be interesting to know if they have comparative advantage in producing these products or not. But for this research, the focus would be on coffee, tea and tin ores sector because these are the goods primarily exported by Rwanda. Measuring comparative advantage from observed data is called revealed comparative advantage (RCA). The method used in the study to measure comparative advantage is Balassa's RCA who suggest that comparative advantage is "revealed" by observed trade patterns instead of looking on pre-trade relative prices which are not observable. The equation is:

$$\text{Equation 3.2: } RCAB_j^i = \frac{\frac{x_{ij}}{X}}{\frac{x_{ij}}{X}}$$

Where X stands for export; i and j stands for a country and commodity respectively. The index is the ratio of the share of exports of commodity j of a country I total exports to the share of the same commodity exports to world exports. If $RCAB_j^i > 1$ country I has a revealed comparative advantage

in the production of commodity j ; the greater the index the higher the advantage. Where, $RCAB_j^I < 1$ indicates that country I has a revealed comparative disadvantage in production of commodity j ; the smaller the index, the greater the disadvantage.

Figure 3.4 Revealed Comparative advantage by sector



Source: World Integrated Trade Solution, 2017

The data derived from WITS are aggregated and not specific based on the HS codes. The categories they chose were not clearly defined in the website. As a consequence, we had to figure out here coffee, tea and tin would belong in each of the wide categories. Coffee could be included in raw materials or in food index and tea is in vegetable index. Minerals sector has the highest comparative

advantage than other sector as seen on the graph. It has grown since 1996 from 2.47 to 28.51 in 2015. Mining sector has a comparative advantage because in 1989 REDEMI (Régie d'Exploitation et de Développement des Mines), a public company, was established to continue the work of mining and exploration and its presence increase the competition in industry. In 2001, there was an increase of the government support and focus on mining sector, through EDPRS¹⁷. The vegetable RCA is volatile overtime and they are losing comparative advantage because in 1996 they have around 24.34 and by 2015 it drop to 12.06. Implying that tea also had declining comparative advantage. For ores the comparative advantage decreased over time but not as large as other sector. For raw materials there is a slight reduction since 1996 from 7.19 to 5.53 in 2015 which shows a small and declining comparative advantage. As for the food sector, there is also a decrease from 9.75 in 1996 to 3.25 in 2014 which means they lost comparative advantage. The reduction in food sector comparative advantage could be a sign of the movement from agricultural commodities to non-agricultural commodities such as minerals, fuels, services and more. As of recent data, Rwanda has more comparative advantage in the minerals sector in which tin ores is a part of.

D. Trends in Export concentration

Export concentration reflects the degree to which a country's exports are concentrated on a small number of products or a small number of exporting partners. A country that exports one product to only one trading partner has a perfectly concentrated export portfolio. Conversely, a country whose exports are comprised of a larger number of products and that trades with a larger number of trading partners has a lower export concentration ratio (ECR), i.e., has more diversified exports¹⁸. The study used Herfindahl index to measure the degree of concentration of export commodities in the country. Herfindahl is computed using the following equation:

Equation 3.3:

$$\text{Herfindahl index} = \sum_{i=1}^N \left(\frac{Xi}{x} \right)^2$$

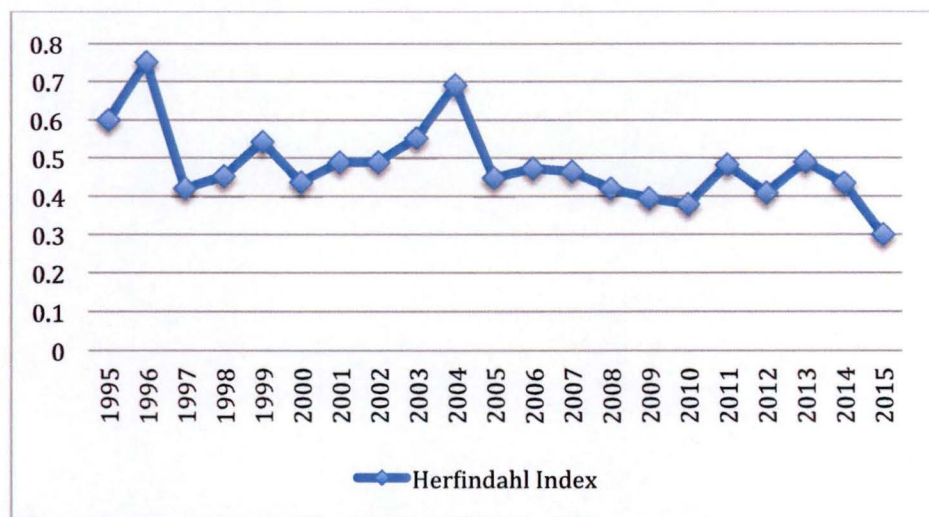
¹⁷ IMF, Rwanda: Poverty Reduction Strategy Paper, 2008

¹⁸ United Nations Conference on Trade and Development, 2009, *Handbook of Statistics*, United Nations Conference on Trade and Development, Geneva

Where x_i , the value of export of commodity i ; X , total value of exports; and N (SITC Revision 3 at 3-digit group level), number of commodities. The value of both indexes ranged between zero and one, the higher the index the more concentration in export or index approaches to zero the country become more diversified in export.

The **Figure 3.5** shows us that export concentration declined over time, which reveal interesting results. The highest concentration observed is in 1996 with 0.7 and there is a continuous decline since 1997. The lower value of the Herfindhal index means that the country has more diversification of exported commodities. Export diversification has contributed significantly to export growth, although the shift from primary toward more manufactured exports, coveted by governments for greater economic development, has been weak. Before 2004 the index was not stable, however, in 2005 it shows a sustained decline in the concentration and went to more diversification. On average, Herfindhal index shows decreasing trend by more than half within two decades. Rwanda moved away from just exporting agriculture products to also exporting refined petroleum and certain minerals diversifying their export portfolio. The crux of the diversification challenge is a larger number of products, higher-value non-traditional products, and more manufactured and processed products, as opposed to the raw coffee and minerals that presently dominate Rwanda's export basket. The country will benefit more from diversification because it reduces and spread the risk and their vulnerability to fluctuations in the world price.

Figure 3.5 Export concentration in Rwanda

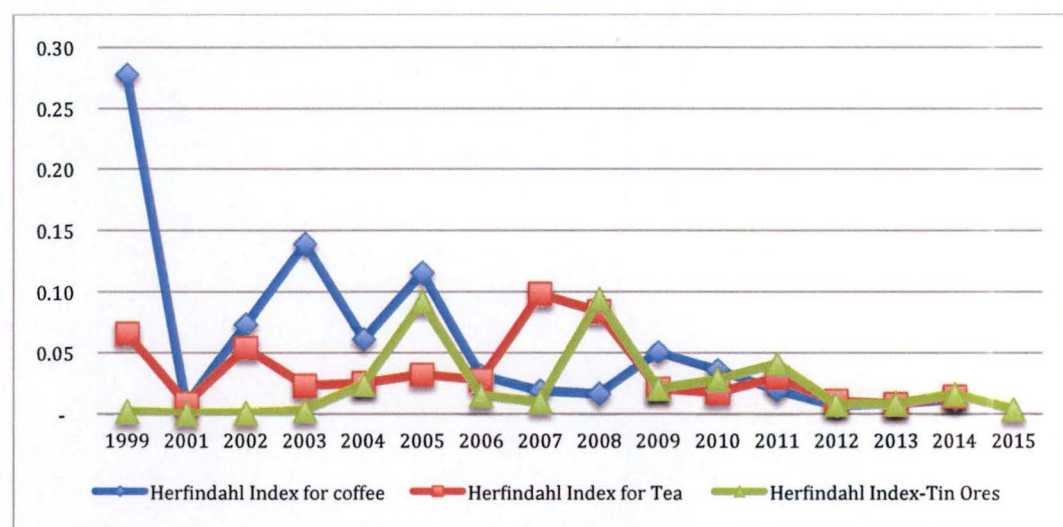


Source: Source: UNCTADstat, 2017
<http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx>

In **Figure 3.6**, the Herfindahl index show less concentration in the coffee sector more than tea and tin ores products. Interestingly, all indices are declining which means there is more diversification in all 3 products. First, it is lower in the coffee sector because of more varieties of coffee produced or more famers producing coffee. Second, the tea sector, in which there are government efforts to increase diversification, shows that its diversification is as large as coffee sector. Third, generally tin ores sector has always had lowest concentration and was able to diversify further by 2015. Overall coffee, tea and tin ores are more competitive now than they were in 1995. The increasing competitiveness could be the result of the inclusion in the EAC regional trade agreement. It forced the country to expand their production to better compete with the products coming in through the partner and to gain more export revenues.

As shown earlier, Rwanda has RCA in the minerals sector and what we see here shows that this sector is more competitive and diversified than the other sectors.

Figure 3.6 Export concentration of major product



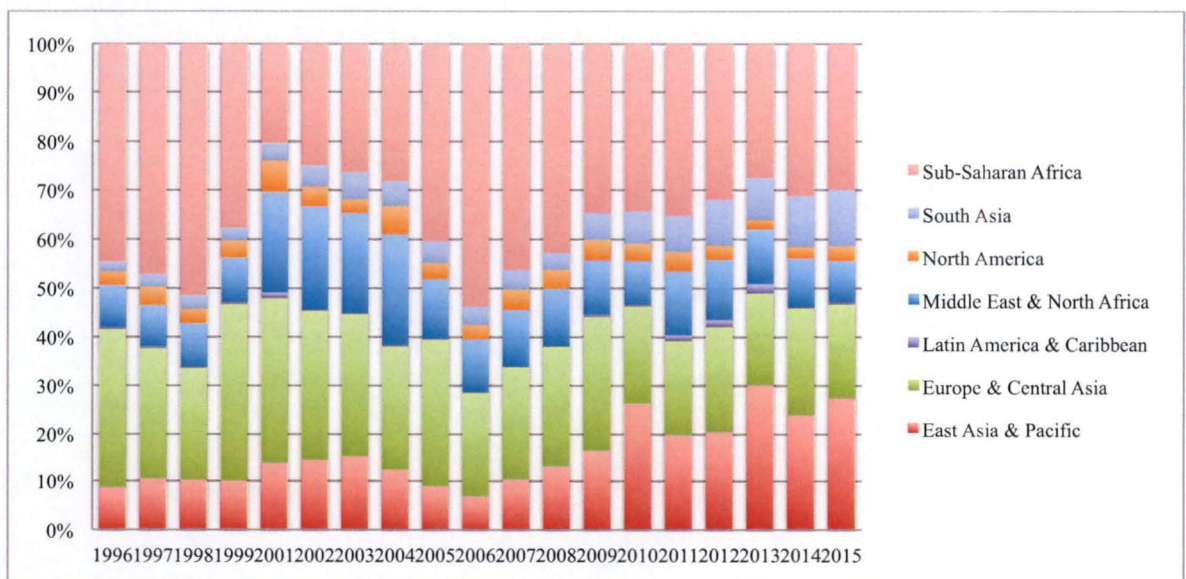
Source: UN comtrade and own computation, 2017

E. Trade linkages

The next figures will show Rwanda’s trade linkages with the rest of the world (ROW). Studying trade linkages aims to see the shifts in trade, if there are any, brought about by the inclusion in trade agreements the country has. It will also allow us to discuss about how these trade relationships changed the concentration of trade for the coffee, tea and tin ores sectors.

The East African Community (EAC) is one of the oldest Regional Economic Arrangements in Africa comprising the Republics of Kenya, Uganda, Tanzania, Rwanda and Burundi, with its headquarters located in Arusha, Tanzania. Rwanda and Burundi joined EAC in 2007, EAC Partner States share a common history, language, culture and infrastructure. These advantages provide them with a unique framework for regional cooperation and integration. Within this situation, the EAC offers many benefits to its Partner States including: increased trade, expanded markets, attraction of Foreign Direct Investment (FDI), increased bargaining power, strengthened security and conflict resolution in the region, and free movement of people across the region. Furthermore, EAC Member Countries undertake several projects together including; transport and communication projects, collective employment and poverty reduction, joint environmental conservation especially on Lake Victoria, and joint tourism promotion.

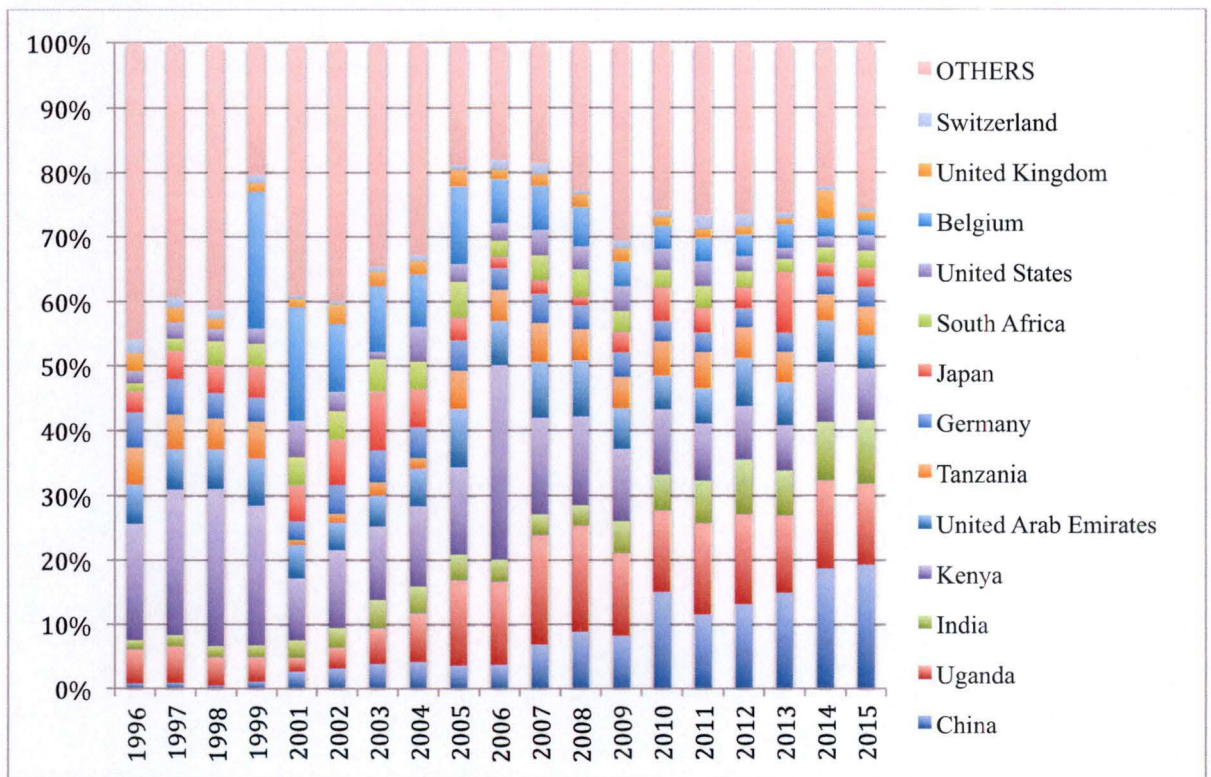
Figure 3.7 Origin of Import Commodities by Region



Source: World Integrated Trade Solution, 2017

Figure 3.7 shows the distribution of Rwanda’s imports by region. It shows that most of the commodities are traded with sub-Saharan countries due to many regional trade agreement that Rwanda is a part of. Asia is the second largest import partner of Rwanda. Europe has the third largest components of imports mostly due to the development initiatives, trade and economic exchanges and cooperation of more political nature

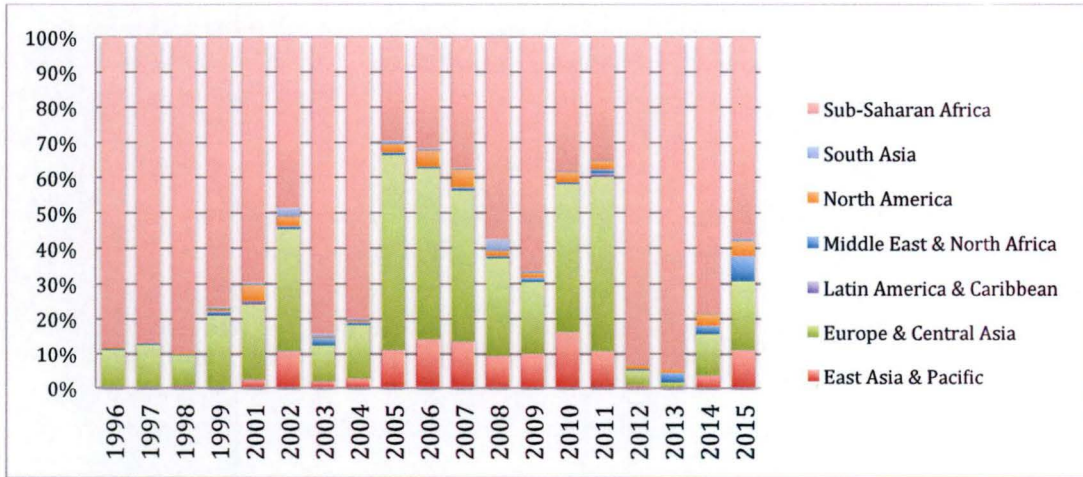
Figure 3.8 Origin of Import commodities by country



Source: World Integrated Trade Solution, 2017

Figure 3.8 shows specifically the top thirteen import sources of Rwanda. As of 2015, China, Uganda and India were the top exporters of commodities to Rwanda. the top 3's shares of import commodities were increasing, whereas, former top trading partners 'share, Belgium and USA, are declining over time. Currently, China is the top import partner of Rwanda and their imports include construction, public transport, etc. because the country is moving to a service-based economy. India is the second top import partner country, they send pharmaceutical products as major part of imports. Uganda is the third top import partner, they send mostly cement for building infrastructure and road networks. Rwanda shifted from USA to China, intuitively it might be that the price of commodities in USA are more expensive than the price given by China. Rwanda Imports with the rest of the world is decreasing over time from roughly 40% to 20% by 2015.

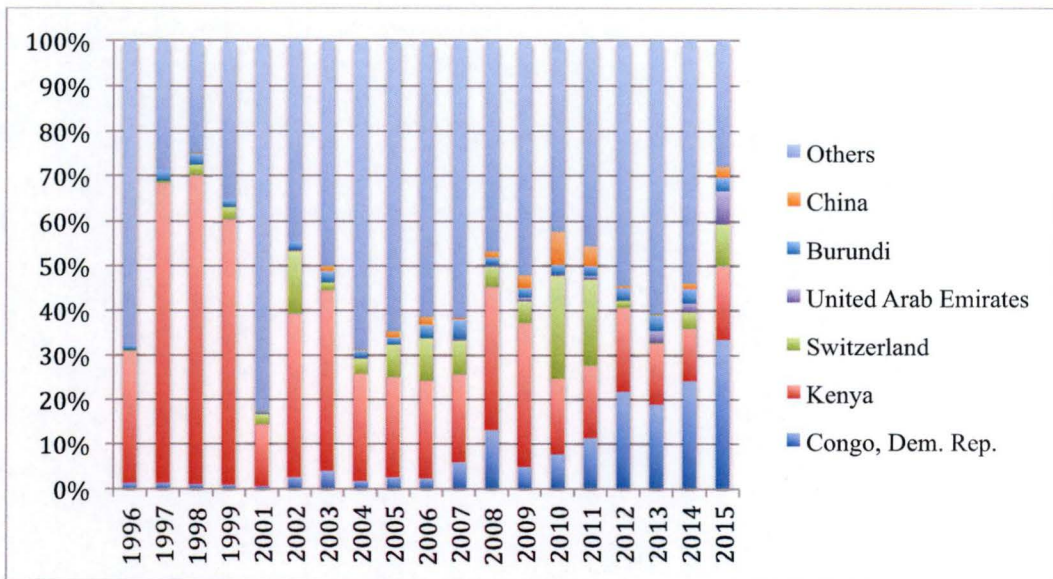
Figure 3.9 Destination of Export commodities by Region



Source: World Integrated Trade Solution

The **figure 3.9** shows the distribution of Rwanda's exports by region. It shows that Rwanda exports primarily to the Sub-Saharan region as the largest exports and second to that is Europe and third is Asia. In 2012, exports to Europe dropped drastically due to aid suspension (Human right allegation) which means Europe did not want to trade with the country and so Rwanda redirected trade to Sub-Saharan region.

Figure 3.10 Destination of Export commodities by country



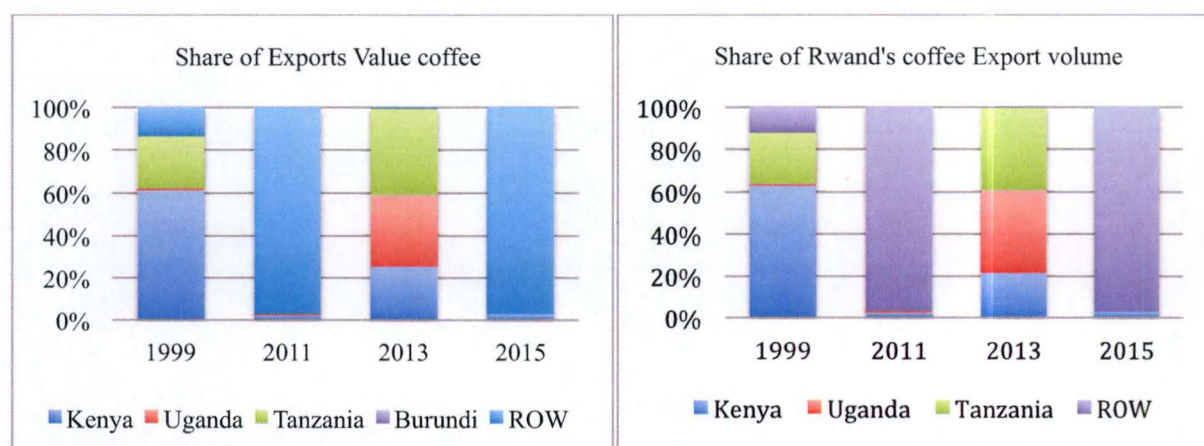
Source: World Integrated Trade Solution, 2017

The **figure 3.10** shows the top export destination of Rwanda. Kenya is a top recipient of exports of Rwanda since 1996, the observation shows that it declined over time and made them the second largest recipient of exports in 2015. The second largest exports partner is the Dem. Rep. of Congo

considered as the stepping stone for Rwanda where the major exports are partly attributed to processed food and manufactured products (excluding mining, coffee and tea)¹⁹. Rwanda reduced their exports to Kenya because Rwanda focusing on its trade with Congo, Dem. Rep or it is also possible that Kenya has the less demand product from Rwanda. In 2010-2011, the Rwanda suddenly export a lot of coffee to Switzerland²⁰. Exports of Rwanda to the rest of the world were mostly larger than the top countries combined.

To summarize the earlier figures it can be seen that Rwanda exports more with Sub-Saharan region and Asia than Europe. For imports, China and India are the top partner and for exports, Congo, Dem. Rep. and Kenya are the top partners. The next section looks at trade with EAC partners in coffee, tea and tin ores sectors.

Figure 3.11 Share of coffee export Value and volume in EAC partners



Source: UN Comtrade and own computation

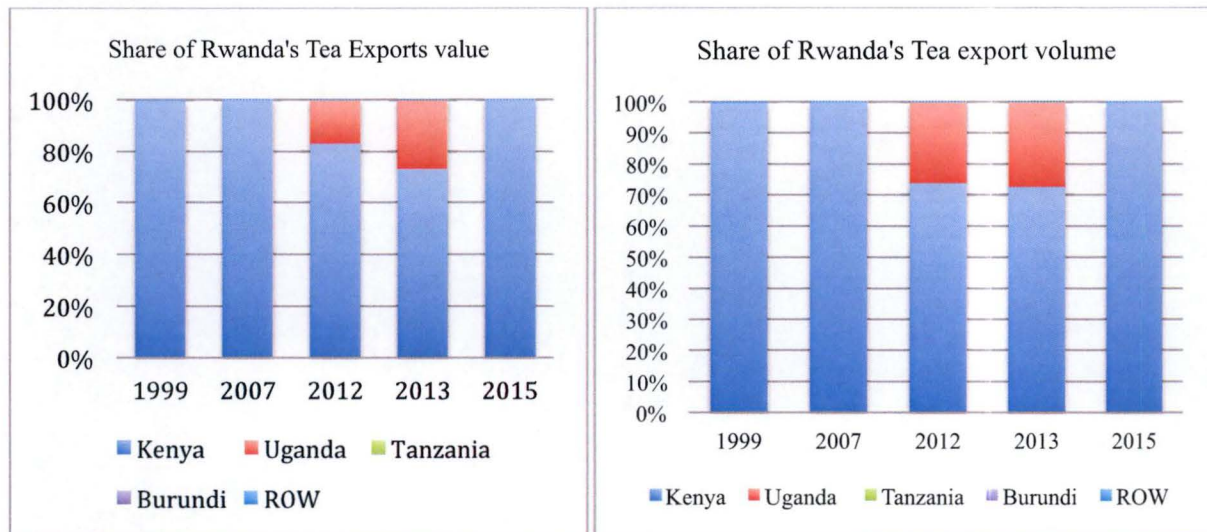
The periods shown here are the only ones with available common data to all EAC member countries. Unfortunately, Burundi does not have any data available in most periods and so the ROW share might have been overestimated as it was computed by deducting the EAC exports from the total exports. In 1999, the export share of coffee to Kenya in term of value and volume were highest to all other countries the trade between the ROW and EAC members are very volatile and shows that price has negligible effects on export value and volume. Surprisingly in 2015, the coffee export of Rwanda was concentrated to the ROW more than EAC members as evidence of trade diversion. It

¹⁹ <http://www.theeastafrican.co.ke/Rwanda/Business/Rwanda-looks-to-DR-Congo-Burundi-for-new-export-markets-/1433224-1459300-h45a8q/index.html>

²⁰ NAEB, National Agriculture export development board, Report 2011-2012

is caused by the more favorable price of the international market than EAC partners. These partners are also known exporters of coffee and so exporting coffee to them does not seem profitable.

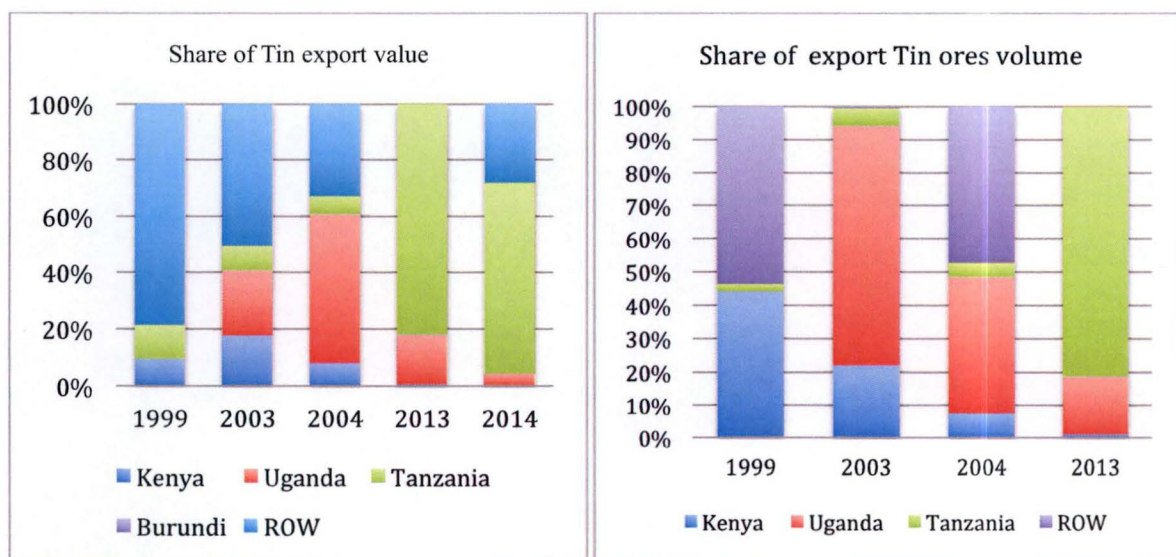
Figure 3.12 Share of Tea export value and volume in EAC partners



Source: UN comtrade, 2017

We observe that the share of export tea in term of value and volume is more concentrated in Kenya that other EAC members since 1999. Data is limited for other trading partners and so it is possible that it is overestimated but overall all tea export in value and volume are traded in Kenya . This could be explained by the fact that Rwanda as a land-locked country , sells the tea in Kenya’s auction tea at Mombasa to make it outside of the African community and the rest of the world.

Figure 3.13 Share of Tin Ores export value in EAC partners

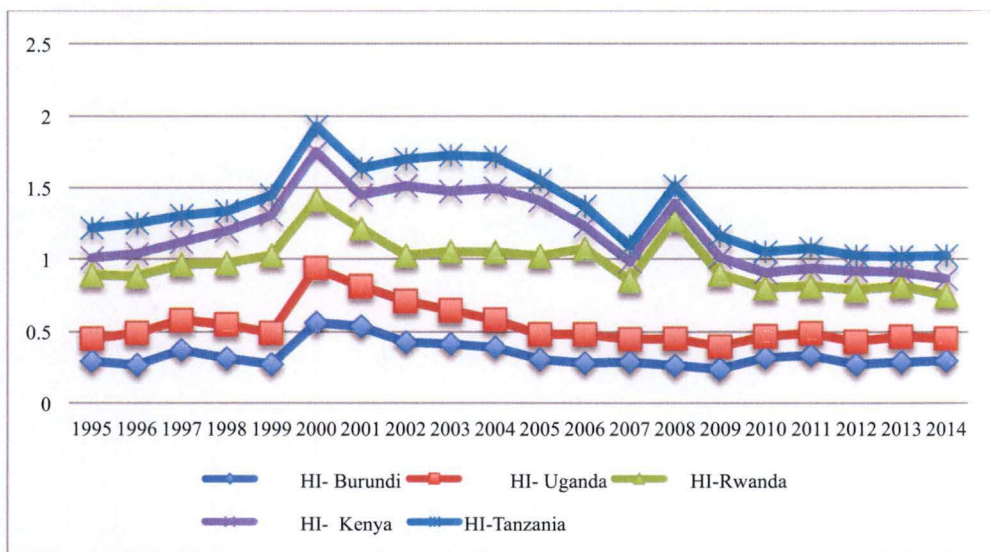


Source: UNcomtrade, 2017

The **figure 3.9** shows a difference between share value and share volume because of the volatility of tin prices on the international market as we observed also in the earlier **table**. The country exports more Tin ores to the ROW in 1999 but by 2013-2014 Tin ores exports value became more concentrated in Tanzania. Tin ores sector export is largest to Tanzania because of the Dar es Salaam port²¹ where the international market is located.

To summarize all these figures show above, the majority of the share of coffee goes to the ROW, tea exports share goes to Kenya due to the Mombasa auction and tin ores exports are largely traded in Tanzania due to the Dar es Salaam port. Rwanda's tea trade after joining EAC did not change that much. The coffee is extremely volatile; their coffee trade, therefore, could be driven by the price of the market. Regardless of the EAC agreements, Rwanda will trade based on coffee's market prices. Tin ores major partner was Tanzania before joining the EAC and after Uganda became the top partner.

Figure 3.14 Export concentration of all products by EAC partners



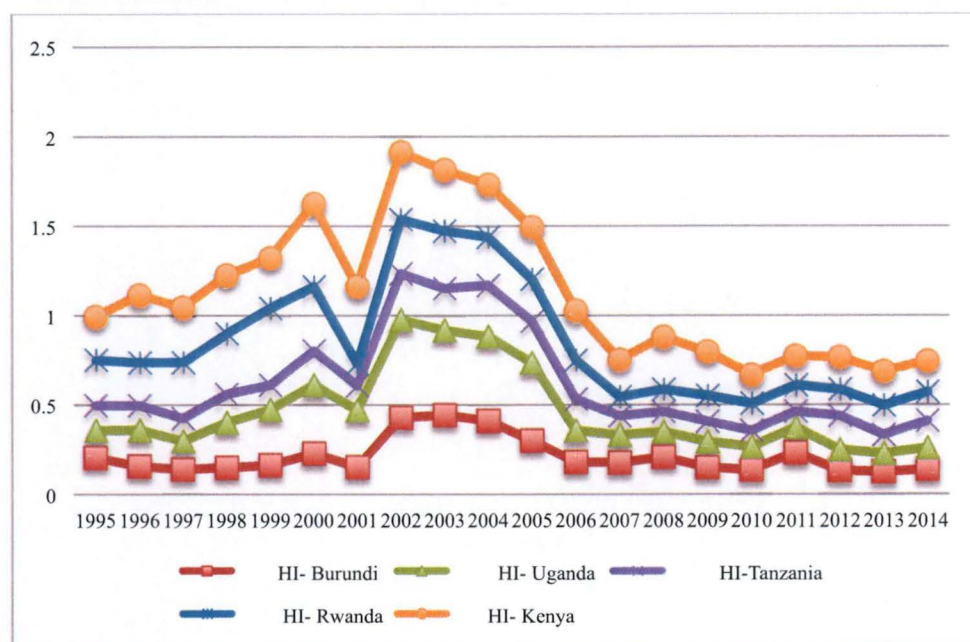
Source: UNCTADStat, 2017

After the revival of EAC on July 2000, the concentration started to decline implying more competitiveness among EAC partners. In 2007, the inclusion of Burundi and Rwanda resulted in more competition as shown by the index. By 2008, the Herfindhal indexes of Tanzania, Kenya, Rwanda show more concentration of products in fewer firms. Intuitively, some exporting firms exited the market or temporarily shut down because of the lower prospective revenue due to the

²¹ <http://www.theeastafrican.co.ke/news/Export-firms-stuck-with-Rwanda-minerals/2558-1709370-dhiouc/index.html>

fall of global prices. The EAC increased the volume of goods being produced by each country and the number of firms in their respective markets.

Figure 3.15 Import concentration by EAC partners



source: UNCTADstat, 2017

The *figure 3.15* shows us that, if there is high concentration it means fewer sector importing in the country. On the contrary if there is lower concentration, it means more sectors importing in the country. Generally, we could say that more sectors are importing products in all EAC member countries on different level. Since the revival of EAC, all member countries had more firms importing commodities as seen in the drop of the Herfindhal index from 2000 to 2001. In 2007 when Rwanda and Burundi joined the EAC, the trends stabilized. However we see that the financial crisis had a little impact on import concentration. This means the firms were not hurt badly by the recession due to policies implemented to protect the financial sector and all economy (IMF 2009)²², so they continue to import from EAC members and the rest of the world.

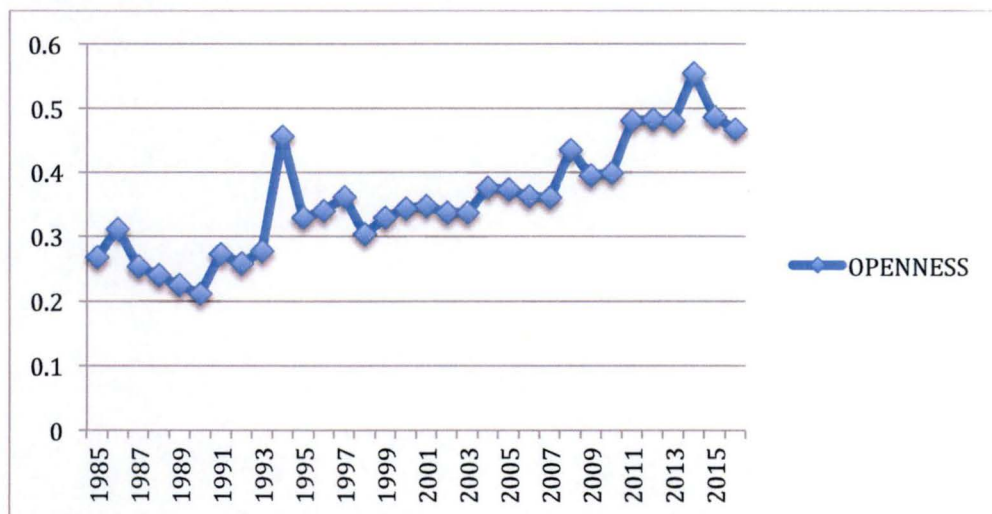
To conclude from trade partners and and their evolution, land locked countries will generally have more difficult time exporting or doing trade due to the high cost of transport to and from the coast. Its performance is far below the average for sub-Saharan Africa, yet somewhat better than Burundi etc

²² IMF, *Impact of the Global Financial Crisis on Sub-Saharan Africa*, 2009

but the trade is overall moving in the right direction and should look into finding better buyers other than partners the EAC, especially developed country which could increase export earnings. Rwanda should also look into building their own transportation infrastructures to increase the mobility of goods and services which reduces their dependency in Kenya and Tanzania as ports. The evolution of trade in Rwanda move where they have more favorable prices. For example the country trade coffee with the ROW because it earning more revenue and benefit from the foreign exchange revenue and it is illogical for EAC parters to buy same raw product they can produce. Rwanda choose that because determine where the price is good but it requierd the efficient institution to monitor the commodity price on regular basis. Lack of hard infrastructure limit trade option.

F. Openness

Figure 3.16 trends of Openness



Source: Africa Development Bank and own computation

Openness can be measured by the sum of total exports and imports of goods and services divided by the GDP. In **Figure 3.16** we could observe the increase of openness since 1990. The spike in 1994 is due to the large reduction in GDP caused by the political instability which make openness variable increase. The effect of joining the EAC in 2007 (East African community) made openness increase further. The aid suspension in 2012 did not negatively affect the openness. Overall there is an increase of Rwanda openness over time as shown above. Similar to what was mentioned by Pigka-Balanika, there is a positive impact to economic growth if countries are more open to trade. Rwanda will have better welfare, larger exports and more employment opportunities (Derosa and Roningen, 2003). Unfortunately, even though Rwanda is very open, it has dependence on exporting primary commodities (coffee, tea, and minerals) and so it cannot fully capitalize on the trade it has

with the ROW. Also, the primary sectors and rural areas are not fully developed and so the farmers there have difficulties to sell their production on the market (Diop et al, 2005). Rwanda has potential for growth through their trade but the sectors do not have the infrastructure and the capacity to optimize production and gain more from trade. In Rwanda's case, the openness is not a good strategy because it made imports increase faster than exports. Exports are not increasing fast enough because of the lack of infrastructure leading to low level of raw material production, limited production of intermediate goods and also limited production of final goods. Because of this, the country does not seem ready to be an open economy. The country could put up some non tariff barriers to the coffee and tea sector until there is enough infrastructure to produce high value added goods for more export earnings.

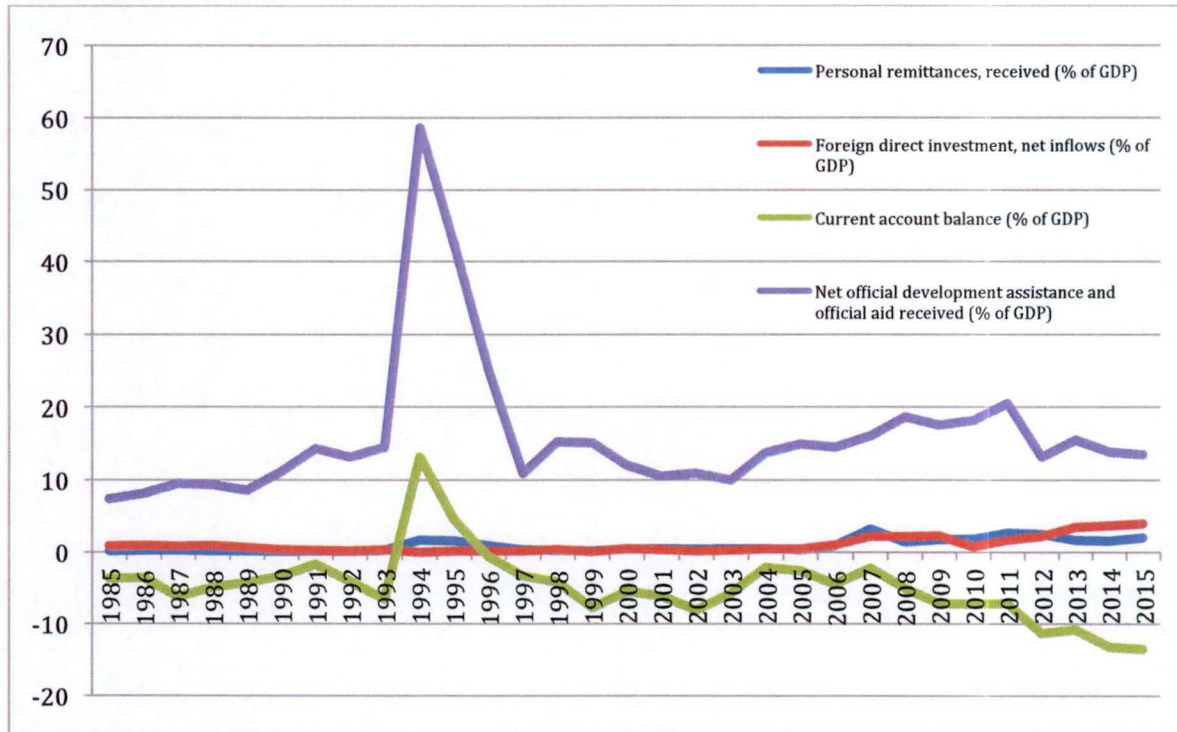
G. The channel through which Rwanda finances his long term deficit

In the *figure 3.17* the current account is volatile in the negatives values because of the excessive imports. The foreign direct investment is low but slowly increasing over time and increased faster after the debt relief through the HIPC initiative in 2007.

Personal remittances are very low but are increasing in 2007 due to the financial crisis, where people sent more money to their home countries. The current account balance has a long-term deficit where it was reduced to a positive value 58.64 in 1994 during the genocide because GDP got so low. After 1994 the current account balance followed more or less the same trend. Later in 2011, there was a huge increase in negative value, where the country experienced high growth and the demand increase.

Normally when countries experience current account deficits they can use foreign direct investment or remittances to finance the shortfall. In our case, they have unsustainable current deficits that were deemed unbeneficial to the economy in the long-run. Foreign direct investment were not large enough to cover for the deficit, it only comprised 3.86% of CAD in 2004(UNECA, 2007). Thus they have to look to other possible sources like remittances. But as seen in the *figure 3.17* remittances were very low and were almost the same level as FDI. Rwanda cannot rely on FDI and remittances, thus, they use aid to finance their long term deficit. Aid is the largest among the three indicators and it is 10 to 20 times larger than foreign direct investment and remittance showing that the country is highly dependent on aid. Nearly half of the development aid they received goes to economic, production, and multi- sector spending (OECD, 2016). These three are supply side policies that help the competitiveness of the economy and help make exports more attractive. This can improve current account position but it may take time to have an effect (Pettinger 2017).

Figure 3.17 Source of financing



Source: World development indicators, Worldbank

Section 4 CONCLUSION

Trade liberalization is a country opening its borders to trading goods and services to other countries where they could benefit from each other. Although trade liberalization is perceived as beneficial, others argue that it is unlikely that the situation of developing world will improve. The developing countries might still not have the comparative advantage to face the competitiveness in the market and to achieve a sufficient revenue from the trade liberalization. It is possible that countries will lose from trade liberalization if they don't have a strong industry yet which forces some firms to leave the industry, although having comparative advantage. Rwanda has a comparative advantage in few sector especially in mining sector , coffee and tea sector but is not enough to drive the economy to fast growth, to develop faster etc.

On a lighter note, trade liberalization could increase the economies of scale because of larger production, it increases competitiveness which imply high productivity from industries and improvement in labor division. In addition, the price of commodities become cheaper as more goods are traded and more varieties will be available that increases consumer welfare.

Rwanda, a developing country, benefitted from trade liberalization in general. The benefits acquired are cheaper imported commodities, larger market for exports and increased market competitiveness in the top export commodities. Openness of Rwanda has been increasing as seen in the ratio of total trade with respect to GDP. The prices of export commodities such as coffee and tea increase following the same trends with the exports volume but for tin ores price was more or less constant. The country earned more foreign revenues for all commodities. Firms grew like mushrooms and they diversify their products which promote the export sector.

Rwanda joined EAC in 2007 and the data shows that there is improvement in trade with the EAC members exports and imports have increased. The trade agreement allowed them the free movement of goods and services to the international ports in Kenya and Tanzania. Because of the larger market, Rwanda exports more of goods and services and imports some commodities used for infrastructure. The country's import partners changed because of the commitment of the agreement with EAC.

While trade diversion is defined as trade moving from one country to another, the data showed what happened in the coffee sector when Rwanda diverted trade from Kenya to the ROW due to the

favorable price on the international market. However, in tea and tin ores sector there is diversion, exports remain strong with EAC partner than the ROW.

Unfortunately, the overall improvement in exports was not sufficient enough to remove the current account deficit as imports were largely increasing at the same time. Since 1985, the long term trade balance deficit is mostly financed by the aid (official development assistance, grants, etc.) because the foreign direct investment and the remittances are very low and are not enough to cover the trade deficit.

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