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Regional Trade and Competitiveness of Rwandan Agriculture: Empirical Analysis of Selected Priority Foodstuffs

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Abstract

This study aims at investigating the impact of regional integration on the agricultural trade development by focusing on wheat flour, maize grain, maize flour, potato, rice and soybean, fresh bean and dried beans sectors selected among priority foodstuffs in Rwanda. This is motivated by the lack of the studies comparing the competitive performance of all priority staple foods sub-sectors in Rwanda in the context of regional trade. The analysis used secondary data obtained through documentary reviews and those collected from the National Bank of Rwanda and FAOSTAT on imports and exports of Rwanda from 2007 to 2017. Apart from the literature review, the analysis was conducted using the Net Export Index (NEI) and the Grubel-Lloyd (GL) measure. The literature review and empirical results reveal that Rwanda benefited from its accession to regional and global trade blocks, especially in terms of the ease of access to external markets through the establishment of the Common Market, the Customs Union and the alleviation of some of trade barriers for basic foodstuffs and consumer goods. The analysis of the Net Export Index and the Grubel-Lloyd measures revealed that Rwanda can have a comparative advantage for wheat flour, fresh beans and dried beans at regional and global markets if measures aiming at developing a dynamic commercial network and improving agricultural value chains productivity are put forward.

Key words: Regional trade, competitiveness, Rwanda, Agriculture, Potato, Wheat and Bean

Theme: The African Continental Free Trade Area: Challenges and Opportunities

Sub-theme: Regional integration

1. Introduction

Agriculture is the backbone of Rwandan economy. This sector needs to be globally competitive to enable the country to have sustainable economic growth and development through the economic independence from the rest of the world. Most of the population is employed in agriculture with more than 85% of all active population in 2012 (Alinda and Abbott, 2012), and around 72% in 2017 (FAO, 2018). This sector also serves as a livelihood source for around 53% independent farmers (NISR, 2018). More than 90% of food consumed in Rwanda is produced by domestic economic operators (RDB, 2012) and considered the cornerstone of food security (RDB, 2012). It contributed 30 per cent to the GDP in 2016 (NISR, 2017) and 33% in 2017 (FAO, 2018). To strengthen its economic development, the Government of Rwanda adopted diverse development initiatives and elaborated different anti-poverty policies and many schemes were initiated. All these policies and schemes were initiated consistent with Rwanda long-term development (Alinda and Abbott, 2012) that also recognized the regional economic integration as one of the significant drivers contributing to the sustainable economic development of the country (MINECOFIN, 2000).

Rwanda got official membership of the East African Community (EAC) in 2007 as the 5th member state after Kenya, Tanzania, Uganda and Burundi, with the purpose of enhancing economic growth and development through the rise of the market share of both agricultural and manufactured products on the EAC market. This has led the country to revise the trade policy, the agriculture development schemes and strategies to account for this important aspect of regional integration, basically its benefits (Musabanganji et al., 2016). The supporters of the regional integration focus on the effects and the costs of Regional Trade Agreements (RTAs) on net trade creation. The RTAs' effects pass through trade liberalization, putting emphasis on the removal of trade barriers that caused waste of resources, as well as the minimization of the costs of market disintegration. They also focused on the investment inflows that are expected to generate increasing net trade gains (Matthew, 2003).

This follows the benefits of regional economic integration such as the expanded market, increased foreign direct investment through the setting up of the best business environment, increased negotiation capacity, development of exchange system, free movement of people, increased efficient use of resources, improved infrastructure, motivation and involvement of the private sector, promote peace and security among others (see Ombeni, 2008; Mwashu, 2011; Nene, 2012), which result from the reduction or removal of trade barriers (technical and non-technical barriers) only between the states joining together (Krugman & Obstfeld, 2003). To take delight of these benefits,

country members of a community should commit to increase the value of its products, to achieve high diversified economy, and avoid any form of political instability that destroy the industrial sector and thus undermine the agricultural production (Nene, 2012). The free trade, more specifically the international food trade, significantly affect food security of households in member states of a free trade area through the increase supply of foodstuffs and the reduction of seasonal shocks of food supply. The intraregional trade transactions boost the economic growth through increased job creation and the enhancement of income-earning capacities for the poor (Matthews, 2003).

Even though a big number of past regional trade agreements significantly neglected the agricultural trade, agricultural products and specifically food products were classified as sensitive and thus subject to tax exemptions and longer transition periods, among other free trade stimuli (Matthews, 2003).

Besides the very known factors of national competitiveness, namely, economic performance, government efficiency, business efficiency, and infrastructure (Schwab, 2010; Croes, 2011), innovation is also stated as another driver of global competitiveness of a country (Dijkstra et al., 2011; Schwab, 2017). It is enhanced by the skilled people and the access to new inputs (Lopez, 2017). Nowadays, Rwanda is ranked the 58th in competitiveness with GDP per capita of USD 729 out of 135 countries assessed (Schwab, 2017). The more a country is able to efficiently and productively produce a good, the more likely the country will have an absolute and a comparative advantage in the international market (Afzal et al., 2018). This will show the superiority of a country in producing a good or a service (Latruffe, 2017).

For countries to benefit from regional integration and globalization, they must embrace completely changes in production, processing and distribution settings of food products to achieve competitiveness of foodstuffs sector in terms of quantity, quality and price through specialization (Bečvářová, 2008). This is facilitated by the increase in trade openness and the removal of restrictions to local producers on the quantity of goods to be produced and traded, which is coupled with the reduction of tariffs. This will lead to improved home markets, increasing foreign direct investment, and the adoption of high technologies that stimulate the exports given the reduction of the cost (Timoshenko, 2013). It is also important to note that preferential trade arrangements produced both trade creation and trade diversion effects in developing countries. The RTAs led to cost maximization of trade diversion and encouraged the transfer of incomes from the poor to the rich (Matthew, 2003).

Since the new agricultural policy adopted in 2004 (MINAGRI, 2004) that came to complement and support the implementation of regional initiatives to improve staple foods intra-regional trade (MINECOFIN, 2000; Musabanganji et al., 2016), even though numerous transactions on food products were operated within EAC area, the documentation on the benefits of intra-regional trade benefits on agricultural trade

development and food security is still scarce. This paper seeks to establish the relationship between the regional trade development and the level of agricultural trade performance of Rwanda. It will analyze agricultural trade flows between Rwanda and regional trade partner countries, and assess the competitiveness of the Rwandan staple foods sectors. The study findings will provide more information to the national planners, agricultural development partners and policy makers to elaborate policy and strategic frameworks. Such policy and strategic frameworks will also be used to (re)define the responsibilities, works and operations of all stakeholders to improve the foods supply chains by strengthening all staple foods sub-sectors so that they become more competitive and able to generate income for producers.

This research on regional trade and competitiveness of Rwandan agriculture with special focus on selected priority foodstuffs is strongly linked to the central theme of the 5th EPRN Conference, the African Continental Free Trade Area: Challenges and Opportunities. It falls directly in the area of economic integration that aims at promoting free movements of goods, labor and capital within the region encompassing a trade bloc whose member countries have signed a free trade agreement (FTA). Even though the African Continental Free Trade Area is currently the priority economic goal of all African political leaders, there are a number of trade blocs that include East African Community (EAC) composed of Rwanda, Burundi, Tanzania, Uganda, Kenya, and South Soudan. This implies that EAC is part of the whole African Continental Free Trade Area. This shows that an analysis of competitiveness within EAC is strongly related to African Continental Free Trade Area (AfCTA).

The study findings will help gain a deeper understanding of trade related aspects, and contribute to the already existing literature, as well as opening door to a range of studies in agricultural economics. The study will also help scaling-up the mode of operation of the staple foods value chains, and upgrading the agribusiness and trade policy framework in Rwanda¹. At the successful completion of this research, it is expected that (1) the level of competitiveness of the Rwandan staple foods sub-sectors on regional and neighboring countries' markets is evaluated, and (2) policy recommendations to guide national planners, agricultural development partners and policy makers are formulated, based on the major findings.

2. Literature Review

2.1 The concept and analysis of competitiveness

The Regional Trade Agreements (RTAs) among competitive and/or complementary countries provide positive short run and long run benefits for member states (McIntyre, 2005). However, Rose (2002) proved that the World Trade Organisation (WTO) member countries behave in the same way as the non-members in terms of trade

¹ This research is directly related to AfCTA because countries that perform best as members of regional free trade area may perform better in a continental trade agreement.

liberalization. The year 2008 marked the renewal of the role of agriculture as a powerful instrument to raise incomes of extremely poor people, which is boosted by the increase in global food prices (WDR, 2008; Byerlee et al., 2012). It was thus decided to find a new orientation of Rwandan agriculture sector and thus move from subsistence agriculture to market oriented agriculture (MINAGRI, 2008; WDR, 2008; Byerlee et al., 2012). This requires adding value to agricultural products, enhancing exports of both traditional and export crops and products through strengthening regional cooperation and integration, as well as economic diplomacy (Republic of Rwanda, 2017).

Rwanda is a growing country in different economic sectors including Agriculture. This sector is considered as a backbone of the economy due to the prominent role it plays in its development. Agriculture production is drastically growing in Rwanda relative to industrial output two decade ago. Although impressive change in agriculture has been registered, Musabanganji et al. (2016) point out that agricultural production is insufficient for the domestic and regional demand. Rwanda mainly export tea and coffee; particularly Rwanda exports of dry beans, potatoes, maize, rice, cassava flour, maize flour, poultry and live animals within Eastern Africa (FAO, 2018). Musabanganji *et al* (2016) view the benefits of sufficient production as advantage to the competitiveness in the neighboring countries' markets whose access is facilitated by its accession to the EAC. Kerimova, Rakhimzhanova, Beibit and Gulnur (2015) argue that, providing access to markets gives possibility to exploit the full potential of agriculture sector through competitiveness.

Rwanda adopted different mechanism and strategy to promote agriculture by encouraging private sector to increase agriculture production with purpose to promote investment opportunity, national economy performance and potential evidence of competitiveness at regional market. Competitiveness concept is the most common used tool in different economic studies regardless of complexity of definition of “competitiveness” which is not correctly precise according to literature (Siudek and Zawojaska, 2014). However, all ambiguous about the definition of competitiveness, Kerimova, *at al.* (2015) underlined the importance of competitiveness of agriculture products in providing the significant additional source of production growth, which result in improving the country's food security. Dlamini, Kirsten and Masuku (2014) assessed the fundamental nature and the dterminants of competitiveness for the firm to survive in diverse economic situations.

A number of studies used the concept of competitiveness as a reference while analyzing the factors that influence economy at national, regional and globally. For instance, Wigier (2014) adopts competitiveness and efficiency approach to show that farms are primary sources of Polish economic strength. Dlamini, Kirsten and Masuku (2014) identified the factors affecting the competitiveness of the agribusiness sector of Swaziland. Siudek and Zawojaska (2014) mirrored the complexity of the aspects of competitiveness using composite indicators to measure competitiveness. Vavřina and Basovnicková (2015) identified suitable financial and nonfinancial instruments to increase the competitiveness of domestic family farms in the context of EU Common

Agricultural Policy (CAP) for years 2014–2020. Nivievskiy and Von Cramon Taubadel (2009) proposed computation of competitiveness indicators based on micro-level data to overcome the significant intra-sectoral heterogeneity.

However, despite the empirical studies that highlight the necessity of competitiveness to identify factors that influence different aspect of economy performance, some limitations were pointed out by some findings of researchers. Siudek and Zawojka (2014) findings highlighted the limitation of the empirical research on competitiveness that is the imperfect comparability of results across studies using different variables (features) that describe competitiveness. Nivievskiy and Von Cramon Taubadel (2009) point out that the measurement of competitiveness in agriculture based on data for average or ‘typical’ farms are highly heterogeneous; consequently the inferences based on this measurement can be very misleading.

2.2 Regional integration and agricultural competitiveness

Since long, the effects of regional integration and trade liberalization on agricultural development have been discussed. Diao et al. (2001a, b) pointed out that the level of intra-regional agricultural trade is influenced by not only adjacency and trade, but also by transportation cost and/or changes in technology. They showed the importance of regional integration saying that the trade behaviour of a country affects the trade behaviour of its neighbours, then the adoption of the same trade goals and regimes has greater trade effects on neighbouring countries than more distant ones. The common interest is a primary motivation of neighbouring countries to adhere to a regional trade agreement among them.

For countries to make benefits from regional integration and regional trade agreements, they should specialize their production to a certain range of goods and services with respect to available resources (Krugman et al., 2014). While explaining specialization, different researchers have considered different factors related to inter-country differences. These factors include demand and consumer preferences (Davis & Weinstein, 1996; Lundback & Torstensson, 1998), product differentiation and international technology differences (Trefler, 1995), and country-size differences (also known as market-size effect), and factor-endowment differences (e.g., Torstensson 1998). Based on economies of scale and trade costs, it is more likely for a small country to specialize in standardized products in scale-intensive industries, while a large country is likely to be a net exporter (Helpman & Krugman 1985). In countries with low speed of urbanization process, the increase in agricultural exports influences the economic growth than the countries with expanded market demand (Aksoy & Beghin, 2004).

Alongside the Doha Round on trade liberalization, the majority of WTO members prioritized free agricultural trade strategies (Potter & Burney, 2002; Grant & Lambert,

2008). Member states of East African Community (EAC) decided to subsidize the exports of agricultural products to make the sector competitive and thus protect it from industrial countries (McIntyre, 2005), and this decision was in line with their policy on "sensitive items" (see World Bank, 2003) that include agricultural products (milk, palm oil, sugar, rice, wheat, wheat flour) and others (cigarettes, dry cells, garments, used clothes, tires, vehicles, vehicle chassis, etc.). Moschini et al. (2008) proposed three strategies to the member countries to increase their benefits from regional trade agreements: first, competitive provision of quality in agricultural markets through certification; second, subsidize the certification of the high-quality goods; finally, set entry appropriate entry requirements and elaborate trade policies in consideration of the global framework of competition². The trade policies among EAC members resulted in the improvement of intra-regional agricultural trade since agricultural products are among the most traded products within the area, besides manufactured goods and electricity (Castro, 2005).

2.3 Competitiveness of agricultural products versus manufactured products

In some regional trade blocs, the integration has contributed significantly to agricultural development. The exemplary trade area for this concern is the European Union where most attention was given to agriculture in the "Common Agriculture Policy, CAP" (Brouwer & Lowe, 2000). Gorton et al. (2000) revealed that farmers in EU member countries were price-competitive both at world and EU markets, with special reference to cereal producers in Czech Republic and Bulgaria. The continuous support to farmers through the CAP-post 2013 (see European Commission, 2013) continues to boost the agricultural competitiveness in the area. Vavřina and Basovníková (2015) reported that this policy encouraged both small and big farmers to increase their competitiveness thanks to financial and non-financial supports. Cankurt et al. (2013) also pointed to the agricultural competitiveness among the EU member countries through the increase in total factor productivity as a technical change.

As for the manufactured goods, the research reported that the regional integration mostly affected the industrial development in Europe. Baldwin (1989) noted that the market expansion led to higher economic growth rate in the European Union since it influenced the savings and investment in the short run and production scale, consumption size, innovation and profitability in the long run. Sapir (1992) mentioned that the integration process is beneficial not only to the European community but also to

² Moschini et al.'s (2008) suggestion followed the debate on different issues: the WTO negotiations, their implementation and intense disagreements among countries (see Fink & Maskus, 2006); division among countries on agricultural trade and other trade policies (see Josling, 2006); protection of intellectual property (Moschini, 2004); and the necessity to safeguard the culture and preserve traditional methods of production (see Broude, 2005).

her trade partners. He stressed the cases of natural integration where regional partners form a bloc (that is trade liberalization) that is beneficial to the whole world, and the strategic integration that lead some countries to make gains while others make loss. Brühlhart and Torstensson (1996) observed that there was increase in industrial specialization within European countries on the period 1960-1990 as a result of regional integration. As for Smith (2003), he witnessed that the European integration drastically transformed the cloth industry both among the bloc members and in Slovakia. Following the increase in the price of cloths in Western Europe, the traders and households decided to get cloths from the post-communist Eastern Europe where the price was relatively low. You will find more other research that have discussed the effect of integration on the competitiveness of manufactured goods and concluded that the integration process resulted in industrial development in particular and in economic growth in general.

In Central America³, agricultural sector has been benefited from protection as part of the intra-regional agricultural trade. The liberalization of regional trade in this area resulted in a net gain for farmers in net exporters and consumers in net importers of the four selected crops, namely rice, sorghum, yellow maize and white maize (Rueda-Junquera, 1998). In North America⁴, the trade exchanges between Canada, Mexico and the United States affected mostly the automobile industry specifically in the 1980s and 1990s through the vital innovations, new markets, new institutional settings and corporate organisations and labour market relations (Carrillo, 2004).

In Eastern and Southern Africa, the research on the effects of COMESA⁵ by Karim and Ismail (2007) indicated an increasing potential for intra-regional agricultural trade for country members and concluded that COMESA members states should set trade policies the encourage regional integration for them to gain the trade benefits and other advantages from this scheme. However, Kenya is said to be not competitive in the wheat sub-sector, the reason why it has requested and applied some protection measures as per the COMESA treaty provisions (Gitau et al., 2010). For the manufactured goods, Tumwebaze and Ijjo (2015) realized that COMESA has no significant effect on economic development of the member countries. They inferred that the economic growth in these countries is rooted from the increase in capital stock, population and trade openness to the rest of the world.

³ The Central America Free Trade Agreement (CAFTA) is created on May 28th 2004 by five countries namely Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua (Jansen, 2008).

⁴ For this region, NAFTA (North American Free Trade Agreement) is created on January 1st 1994, between Canada, Mexico and USA.

⁵ COMESA stands for the Common Market for Eastern and Southern Africa. It was formed in 1994 to replace the Preferential Trade Area created in 1981. The current members of COMESA are Egypt, Libya, Sudan, Tunisia, Djibuti, Eritrea, Ethiopia, Somalia, Comoros, Madagascar, Mauritius, Seychelles, Burundi, Kenya, Malawi, Rwanda, Uganda, Eswatini (Swaziland), Zambia, Zimbabwe, and Democratic Republic of Congo.

The competitiveness of agricultural products were analysed in ECOWAS⁶ area. Olayiwola et al. (2011, 2015) affirmed that intra-exchange promoted the exports of agricultural products within the sub-region and suggested the strengthening of the trade liberalization and economic facilitation to help the member countries to achieve higher performance of agricultural exports. Odularu (2011) asserted that farmers within ECOWAS area have increased the productivity, improved their level of competitiveness and consequently benefitted the trade gains from accessing European markets through the economic partnership agreements established between ECOWAS and European Union. In this line, Olayiwola and Ola-David (2013) stressed the effect of the growth of agricultural production on the exports and concluded that ECOWAS trade area should integrate agricultural priorities and be implemented through special free trade strategy, known as ECOWAP and ETLs respectively. As for the analysis of the competitiveness of the manufactured goods, Osabuohien (2007) showed positive and significant effect of free trade agreement on economic growth and development of ECOWAS members, taking Ghana and Nigeria as case-studies, while Esso (2010), after re-examining the relationship between the finance and the growth, pointed out to the long run relationship between financial development and economic growth.

Different studies have analysed the effects of regional trade agreements on the competitiveness of manufactured goods. The examples include Frank (1978) who identified learning by doing, the level of technology, intra-sectorial specialization, and competition as the driving factors of high efficient use of resources and improved quality of products in developing countries. There is also Krueger (1978) who explained two processes whereby the economic growth is influenced by the trade openness, namely through (1) dynamic advantages that include best use of available resources, capacity and efficient management of investment opportunities, and (2) indirect effects that concern more liberalized trade aiming at boosting exports and gross domestic product. Riviera-Batiz and Romer (1991) considered research and development as a source of economic growth and concluded that the access to know-how technology and high incentives for industrial production are enhanced by accelerated process of trade. Asheim and Isaksen (2002) advised firms to exploit both locally and externally available resources and world-class to enhance their competitiveness, coupled with appropriate innovation systems and technology transfer. In different Southeast Asia, Yoshimatsu (2002) proposed that countries need to gain the economies of scale to use efficiently available resources and achieve high value-added products. Given the

⁶ ECOWAS is the Economic Community of West African States, created on May 28th 1975. The current members are Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

smallness of ASEAN⁷ domestic market, individual firms decided to sell their manufactured goods in the region from firm to firm, from consumer to consumer.

3. Materials and Methods

This paper has used secondary data on imports and exports retrieved from FAOSTAT website, Rwanda Revenue Authority and National Bank of Rwanda to analyse the level of trade performance for soybean, bean, maize, potato, rice and wheat⁸ sectors from 2007 to 2017. The analysis of trade performance at the sector level can be carried out by assessing trade indices of competitiveness. Latruffe (2010) presents a list of indicators based on the neoclassical economics which focuses on trade success and which measures competitiveness with the real exchange rate, comparative advantage indices, and export or import indices.

We use the Net Export Index (Bantele & Carraresi, 2007) and the Grubel-Lloyd (GL) index (Grubel & Lloyd, 1975) for data analysis. These indices are preferred to traditional accounting methods because the latter do not account for the distribution and marketing expenditures (Frohbert & Hartmann, 1997).

The export market shares (EMS) are a simple measure of competitiveness. EMS can be measured in terms of quantity or in terms of value. The net export index (NEI) is the country's or sector's exports less its imports divided by the total value of trade (Banterle & Carraresi, 2007). In our analysis, we used the net export index (NEI) and the Grubel-Lloyd (GL) measure (Grubel & Lloyd, 1975) for each of the three sectors. The NEI is the difference between a sector's exports and imports divided by the total value of trade (Banterle and Carraresi, 2007).

$$(1) NEI_{ij} = \frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}},$$

where X are exports; M are imports; j denotes a sector or product; i denotes the country considered. The NEI index lies between -1 (when a country imports only) and 1 (when a country exports only), with a value of 0 in the case of equality of imports and exports.

The export-to-import price ratio allows the difference in quality between exported and imported products to be assessed. It is defined as the ratio of the unit value per ton exported divided by the unit per ton imported (Bojnec, 2003). A ratio greater than 1

⁷ ASEAN means Association of Southeast Asian Nations, created on August 6th 1967 as an intergovernmental cooperation to facilitate economic, political, security, military, educational, and sociocultural integration. The current members are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, The Philippines, Singapore, Thailand, and Vietnam.

⁸ The selected products are mainly the CIP priority crops. They are also the non-traditional exporting crops in Rwanda.

would indicate that exports are more expensive, and thus of higher quality, than imports. The opposite is true for a ratio less than 1.

The measure of Intra-Industry Trade used in this research is referred to as Grubel-Lloyd (G-L) index (see Grubel & Lloyd, 1975; Fontagné & Freudenberg, 1997; Banterle & Carraresi, 2007; Latruffe, 2010).

The GL indicator assesses the health of exports by accounting for the fact that a product is often exported and imported at the same time (Latruffe, 2010). It measures intra and inter-industry trade for a given product. The formula of G-L index is as follows:

$$(2) GL_{ij} = 1 - \frac{|X_{ij} - M_{ij}|}{X_{ij} + M_{ij}},$$

where X are exports; M are imports; j denotes a sector or product, i denotes the country considered.

The GL index has a range between 0 and 1, with the value 0 indicating that all trade taking place inside the j -th product group is inter-industry (e.g. only exports, or only imports), while the value 1 indicates an intra-industry trade only (exports equal imports).

4. Results and Discussion

The analysis of external trade performance for the Rwandan priority foodstuffs can be performed by evaluating the trade indices of competitiveness (Latruffe, 2010). According to Frohberg and Hartmann (1997), the use of these neoclassical economics-based indices has the advantages of taking into account the marketing costs for exporting or importing targeted agricultural products, and considering simultaneously the demand and supply responses.

The results reported in Table 1 show that the Net Export Index (NEI) is mostly negative for maize grain, maize flour, and potato revealing that the imports are greater than exports. The same results disclose the information that the country is a net importer of rice and soybean. For fresh beans, dried beans, the NEI results indicate that the country has registered an increase of exports in value comparatively to imports for most of the years under study. The same is observed for the wheat flour whose corresponding net export indices reveal quite a similar pattern for the second half of the period under study during which Rwanda registered an exponential increase of wheat flour exports. This could be attributed to the initiative of the Government of Rwanda to transform the wheat value chain which led to an increase of local production of wheat (Murindahabi, Qiang & Ekanayake, 2018), and the presence of new large-scale wheat processors in the exports sector, with effective commercial production from 2011 (especially for

Bakhersa Grain Milling), that have positively impacted the wheat flour exports (Gathani & Stoelinga, 2012).

Table 1: External Trade Performance: Empirical Results for Priority Foodstuffs

| Year | Net Export Index | | | | | | | | Grubel-Lloyd Index | | | | | | | |
|------|------------------|-------------|-------------|-------------|-------------|-------|---------|--------|--------------------|-------------|-------------|-------------|-------------|------|---------|--------|
| | Fresh Beans | Dried Beans | Maize Grain | Maize Flour | Wheat Flour | Rice | Soybean | Potato | Fresh Beans | Dried Beans | Maize Grain | Maize Flour | Wheat Flour | Rice | Soybean | Potato |
| 2007 | -0.25 | -0.18 | -0.72 | -0.99 | -0.94 | — | — | 1,00 | 0.75 | 0.82 | 0.28 | 0.01 | 0.06 | — | — | 0.00 |
| 2008 | 0.97 | 0.91 | -0.99 | 0.06 | -0.83 | -1.00 | -0.96 | -0,68 | 0.03 | 0.09 | 0.01 | 0.94 | 0.17 | 0.00 | 0.04 | 0.32 |
| 2009 | -0.26 | 0.39 | -1.00 | -0.95 | -1.00 | -1.00 | — | 0,60 | 0.74 | 0.61 | 0.00 | 0.05 | 0.00 | 0.00 | — | 0.40 |
| 2010 | -0.60 | -0.02 | -0.97 | -0.84 | -0.96 | -0.99 | — | -0,20 | 0.40 | 0.98 | 0.03 | 0.16 | 0.04 | 0.01 | — | 0.80 |
| 2011 | 0.04 | -0.67 | -0.94 | -0.92 | 0.35 | -1.00 | -0.97 | 0,60 | 0.96 | 0.33 | 0.06 | 0.08 | 0.65 | 0.00 | 0.03 | 0.40 |
| 2012 | 0.99 | 0.79 | 0.22 | -0.12 | 0.41 | — | — | -0,09 | 0.00 | 0.21 | 0.78 | 0.88 | 0.59 | — | — | 0.91 |
| 2013 | -0.04 | 0.50 | -0.65 | 0.74 | 0.50 | -1.00 | -0.97 | -0,35 | 0.96 | 0.50 | 0.35 | 0.26 | 0.50 | 0.00 | 0.03 | 0.65 |
| 2014 | -0.36 | 0.33 | -0.97 | 0.79 | 0.48 | -1.00 | -0.99 | -0,59 | 0.64 | 0.67 | 0.03 | 0.21 | 0.52 | 0.00 | 0.01 | 0.41 |
| 2015 | 0.70 | 0.38 | -0.82 | 0.74 | 0.52 | -1.00 | -0.94 | -0,23 | 0.30 | 0.62 | 0.18 | 0.26 | 0.48 | 0.00 | 0.06 | 0.77 |
| 2016 | 0.03 | 0.44 | -0.90 | 0.22 | 0.67 | -1.00 | -1.00 | — | 0.97 | 0.56 | 0.10 | 0.78 | 0.33 | 0.00 | 0.00 | — |
| 2017 | 0.93 | 0.68 | -0.97 | -0.07 | 0.76 | -1.00 | -0.98 | — | 0.07 | 0.32 | 0.03 | 0.93 | 0.24 | 0.00 | 0.02 | — |

Source: Own calculations based on data from National Bank of Rwanda and FAOSTAT

The Grubel-Lloyd (GL) Index values show a quite similar pattern for all these foodstuffs, and based on a threshold of a GL measure of 0.5 (Banterle & Carraresi, 2007), the results attest that, for fresh beans and dried beans, Rwanda is exhibiting a strong intra-industry trade for many years out of 11 considered for the study period. For other food products, the GL values are close to 0 attesting that the country has experienced a strong inter-industry trade which is pronounced more for rice, soybean and maize grain and less for maize flour and wheat flour.

Other authors and technical reports from government agencies and development partners working in the agricultural sector and international trade corroborate the empirical results of this study. For instance, regarding the increase of priority foodstuffs imports from neighbor countries, Musabanganji (2007) stresses that despite the increase of production of priority food products resulting from the implementation of sectoral transformation initiatives among which the Crop Intensification Programme (CIP), local maize grain production remains insufficient compared to domestic demand. This is also supported by the assertion by MINICOM (2014) and RDB (2014) that local maize processing companies are operating under their installed capacities, leading then to the increase of maize grain and maize flour imports. The same applies to rice and soybean for which Rwanda is qualified as a net importer. This comes to support the findings by Nkurunziza (2015) and Ghins & Pauw (2018) whose studies attest that, for rice, the country has increasingly become dependent on external markets to substantially satisfy the domestic demand. As for the soybean, a study commissioned by Rwanda Agriculture Board (RAB, 2016) revealed that there is need to increase the investment in soybean value chain as its current productivity is still low, and the import bill to feed local soybean processing companies with raw materials is high. This rise in imports is on one hand grounded in low productivity of many agricultural sub-sectors due to low technology adoption, and lack of efficient and demand-driven extension services. On the other hand, the other reason that would be behind such a fact would be the relatively high production costs for many agricultural products in the East African community region (see for instance, Tukamuhabwa, 2015; Musabanganji, 2017; Nkurunziza, 2018).

The study results also attest that, in addition to being an importer of the above mentioned foodstuffs, Rwanda is an exporter of wheat flour, fresh beans and dried beans. Rwanda exports foodstuffs not only to EAC member countries, but also to other African countries and beyond. As Musabanganji et al. (2016) point out, Rwanda is the main source of agro-food products formally or informally imported by the eastern region of the Democratic Republic of Congo inhabited by more than 2 million inhabitants (including 1.8 million for Bukavu and Goma). Some European and Middle East countries are importing fresh beans from Rwanda, and the Akagera region in Tanzania, Burundi and Uganda are also the importing regions of Rwanda's agricultural products and are the main markets for its agricultural production. These trade flows result from its access to global and regional markets made possible by prioritizing trade-

related global and regional initiatives. Moreover, it should be noted that following its accession to global and regional communities, Rwanda can develop its export potential, especially for wheat flour, fresh beans and dried beans but success will depend more on the increased accompanying measures to develop a dynamic commercial network and improve agricultural value chains productivity.

4 Conclusion and Policy Implications

This paper has shown the contribution of the regional integration in the development of agriculture sector. The literature review showed that, where agreements are effective, regional integration is a powerful tool to enhance the development of agricultural value chains. The development of Rwandan exports industry has increased the quantity of exports to neighbor countries. Through the analysis of NEI and GL indices, the study showed that, for wheat flour, dried beans and fresh bean, the increase of value chains productivity can contribute significantly to the comparative advantage of the country on regional market whose access has been facilitated by its membership to regional communities (for instance, COMESA and EAC). The regional trade agreements are producing learning effects to their member countries as they make them accustomed with the transactions with the partners. From this experience, countries that perform best in trade transactions within an RTA may perform well in the continental free trade agreement. In this regards, it is recommended to work for removing or alleviating the bottlenecks that prevent farmers from producing enough for export. This means that measures should be taken to increase the crop productivity of crops in Rwanda and to enhance the liberalization of trade to sustain the flows of agricultural productions in the region and beyond.

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