

The global competitiveness of West African cashew exporters

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Abstract

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This research applies the comparative advantage principles by using Balassa indices for West African cashew trade (based on the top 10 largest producers) data for the period 2008 to 2017. The analyses examined the competitiveness of cashew in global trade, paying special attention to its duration and stability by analyzing the changes in the RSCA indices between 2008 and 2017. The findings reveal that Benin, Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Nigeria, and Senegal accounted for a remarkable trade surplus, as well as improve export competitiveness. In addition; all of the top 10 West African cashew exporters in the authors' sample [with the exception of Senegal] had a competitive advantage in the world market. Furthermore, as shown by the distribution of comparative advantage indices, the stability tests of lagged indices and the Kaplan-Meier survival estimate, these advantages have been strengthened, showing stable comparative advantages over time. The validity of the paper is that it applies the comparative advantage theory to the top cashew exporters in West Africa. The paper also provides important contributions to cashew literature by examining the duration and stability of the comparative advantages in global cashew trade, which could be of interest to the cashew industry.

Keywords: Balassa indices; cashew industry; West Africa; comparative advantage

Introduction

Cashew (*Anacardium occidentale* L.) is a tropical nut tree probably native to South America, with Central Brazil as the center of origin (Johnson; 1973; Nair, 2010). After the introduction of cashew crops in Asia and Africa during the exploration of European conquerors, mainly Portuguese, cashew has become a major export commodity crop in a number of countries. Growing interest in the cashew kernel, the main product for which the cashew is produced, is a high-value luxury commodity with steady increasing volumes of production and sales over the last 20 years (Azam-Ali & Judge, 2001). There are also expectations that the market will remain strong for some time due to its considerable potentials

to cashew market for high-value by-products such as cashew nut shell liquid, broken nuts, and cashew shell cake (Boillereau & Adam, 2007).

Moreover, cashew has been produced mainly in emerging countries where it is both an agricultural commodity that makes a significant contribution to gross domestic product and export exchanges at country level and a key source of livelihood for smaller farmers, who make up the majority of the producers and processors worldwide (Azam-Ali & Judge, 2001; Fitzparick, 2019). The cashew industry plays an important role in the economic development of countries in West Africa and should therefore be seen as a key contributor to the achievement of Sustainable development goals. Indeed, in this sense, the cashew industry could positively

empower smallholder farmers with particular focus on women, to create income and employment opportunities, and to promote small-to-medium size industrialization process, particularly in rural areas.

Cashews were introduced to West Africa in the 1960s to fight erosion and desertification. Over the past decade, increased demand, expansion of orchards, and increased government prioritization has caused raw cashew nut production to become a critical commercial activity for smallholder farmers, and a major revenue stream for governments. West African production is also growing faster than that of any other region – 10 percent over the past decade, generating US\$1.5 billion in export sales for over 2 million farmers. Côte d'Ivoire is the world leader in cashew production, followed by Ghana, Guinea-Bissau, Nigeria and Benin (CNFA, 2020).

Cashew sustain the livelihoods of millions of people in West Africa, provide a promising pathway out of poverty, and contribute significantly to national economies (Monteiro et al., 2017). Cashew is well suited to seasonally wet and dry tropical climates and has the capacity to grow and yield on well-drained, lightly textured soils with minimal inputs, suggesting that cashew has a very good adaptability to large ecological differences (Hammed et al., 2008). Cashew plantations in West Africa have a unique role to play in mitigating climate change, contributing at the same time to mitigation and adaptation agendas: helping to create sustainable and resilient ecosystems while removing atmospheric carbon (Singh et al., 2013). Concerted action is needed if society is to make long-lasting use of cashew resources for poverty eradication and sustainable economic development, and protect the global forest estate for future generations.

Cashew nuts produced by West African producers face several serious challenges: reduced yields due to aging cashew tree stocks, farmers' limited technical and financial capacity to rehabilitate and renovate aging orchards, and an undeveloped nursery sector unable to provide timely and consistent high-performance seedlings to offset declines in productivity. This is complicated by trade policies that have boosted exports also pit countries against their neighbors, producing uncoordinated, regional policies that weaken public and private-sector support for cashew grower/seller advocacy efforts (CNFA, 2020).

The paper analyses revealed comparative advantages in West Africa cashew nuts trade – at least to the authors' knowledge; this application is actually missing from the literature. Accordingly, this paper adds to the current literature in at least three important ways. First, it contributes to a better understanding of the level, composition, and evolution of export competitiveness in West Africa cashew industry. Sec-

ond, it analyzes cashew trade from the perspective of economic development as cashew nuts are largely produced and exported by West African countries. Third, it makes valuable contribution to cashew literature by analyzing the duration and stability of comparative advantages in the West African cashew trade. Finally, it aims to critically analyze and identify factors lying behind recent comparative advantages of West African cashew producers.

The article is organized as follow: in Section 2, the paper's theoretical basis is described, overview of empirical literature in global agri-food export competitiveness. Section 3, presents the set of countries and time period on which the analyses focus, demonstration of the methodology, the data and variables. Section 4, summarizes the descriptive statistics of global cashew trade, identifying major players and products, while section 5 describes the findings and the stability of the revealed comparative advantage. The final section concludes.

Literature Review

Through the use of Balassa indices, there is a growing body of literature investigating the competitiveness of goods and industries using revealed comparative advantages in agri-food sectors. Aung (2006) examines the commodities with comparative advantages on the Chinese market for three separate periods and revealed that wood-related goods, specifically raw and simply worked wood, showed the highest comparative advantages while vegetables and tubers showed an improved competitiveness in exports between 2000 and 2006. Thunt & Kim (2017) examine the competitiveness of exports of goods or industries in Myanmar from the point of view of revealed comparative advantages using trade data from 2010 to 2015. Findings showed that the country had a significant share of main export product and has revealed advantage in primary sectors. In addition, RCA's findings recognized that, even in the primary sector, most commodities like, forestry, fisheries and livestock showed downtrends overtime for RCA values. Jámbor & Gibba (2017) analyzed the competitiveness of global peanut trade, with a particular focus on its stability and durability. The results indicated the highest comparative advantage for Senegal, Nicaragua, and Argentina as the world's most important peanut exporters.

Thamien et al. (2011) evaluated the Sri Lankan agroforestry crop sector's competitiveness in trade. Relative trade advantages, revealed comparative export advantage and relative comparative advantage indices were measured using HS level 6 trade data for 580 agroforestry products. The results showed that 58 products had both showed comparative advantages and relative export advantages on average, and

124 goods had relative trade advantages from 2001 to 2008 period. Non-traditional exports include avocado, papaya, ginger, pineapple, cashew, lemon and lime, guava, banana, steen and durian. According to the relative trade advantage index, manioc and arrowroot as root crops, ginger and turmeric as medicinal plants, cardamom, coffee, mushrooms, bamboo, vanilla, cocoa and beans have relative trade advantage in the global market. Burange & Chaddha (2008) assessed the competitive advantage of India in the retail trade between 1996 and 2005. The findings suggested that in textiles and labor intensive products such as chemicals, iron and steel, India enjoys a comparative advantage.

Bojnec & Fertő (2015) used the panel unit root tests, mobility index and the Kaplan- Meier survival rates of the B-index (revealed comparative advantage). Their study reveals that most of the agri-food products in the EU-27 states have comparative disadvantage in the global markets. However, majority of the old EU-15 member states had a bigger number of agri-food items with a longer revealed comparative advantages than the new EU-12 member states. The Netherlands, France, and Spain are among the most successful member states in terms of agri-food export competitiveness globally.

Bojnec & Fertő (2014) examined the export competitiveness of 27 EU countries' dairy products on extra and intra EU and world market, using index of revealed comparative advantages over the periods 2000-2011. The results showed that in a certain dairy product category about half of the EU-27 countries have had comparative advantage in export trade. The findings varied by degree of milk product and the markets within EU and outside EU, and they did so over the years under the study. Denmark, France, Belgium, Ireland and Netherlands are old EU 15 countries with strong dairy export. Some of the new EU 12 countries encountered difficulties in sustaining their competitiveness level on export, at least for some dairy products and market segments. Only Poland, Estonia, Latvia and Lithuania were successful. The period of the competitiveness of exports varied throughout dairy products groups giving a degree of processing milk, showing the value of differentiating the dairy industry for export specialization and competition.

Bojnec & Fertő (2012) assessed the effects of EU enlargement on agro-food export performance in 12 new EU member countries and 5 newly independent countries in the EU markets for a nine-year period. Their study revealed that agro-food exports from the new EU member states have a longer duration. The findings demonstrate that EU enlargement to the east has resulted in more exports and longer durations for higher-value added specialized consumer-ready food and more competitive niche agro-food goods.

Fertő & Hubbard (2003) also explored the comparative advantages of the agri-food sector in Hungary for the period 1992 to 1998. The results suggested that the comparative advantage pattern remained relatively stable despite significant changes in Hungarian agriculture in the 1990s. With regard to comparative advantages in the trade of cashew nuts, Alidou et al. (2017) evaluated the competitiveness of the two major agricultural export commodities of Benin which are cotton and cashew. The findings have shown that Benin has a comparative advantage in cashew over its West African neighbors. Fauziyah et al. (2017) analyzed Indonesia's competitiveness of the cashew nuts. The results showed that Indonesia's trade in cashew nuts has comparative disadvantages.

Balogh & Jámor (2017) applied the theory of comparative advantages using B-index, stability and duration analysis to assess the European wine trade for the period 2000-2013. According to their findings, Bulgaria, France, Greece, Italy, Portugal, and Spain were the top European wine producers globally. Nonetheless, the duration and stability tests showed that most of these countries' trade advantages have weakened.

On the whole, literature on the competitiveness, trends and stability of comparative advantage in the cashew industry is limited, at least to the authors' knowledge. This paper aims to contribute to the existing gap in the literature. This article focuses on the macro-country level competitiveness of the West African cashew industry.

Methodology

The aim of this study is to examine the competitiveness of cashew exporters in West African region. For this purpose, a number of indices are used in the literature to assess the degree of competitiveness of a country's trade. The most common index is the comparative trade advantage (B) proposed by Balassa (1965, 1977). In his article 'Trade Liberalization and Comparative Advantage,' he developed a measure of the comparative advantage of trade by calculating the relative advantage or disadvantage of a given country in a certain class of goods, as evidenced by trade flows based on the Ricardian trade theory:

$$B_{ij} = \text{RCA}_{ij} = \left(\frac{X_{ij}}{X_{it}} \right) \bigg/ \left(\frac{X_{nj}}{X_{nt}} \right) \quad (1)$$

where X represents exports, j is the commodity, i is the country, t is a commodity, and n is a set of countries. The B index is based on the observed pattern of trade. It measures the export of a commodity by a country relative to its total exports

and the corresponding export performance of a number of countries. If $B > 1$, then there is a comparative export advantage, i.e. a sector in which the country is relatively more specialized in terms of export. A comparative export disadvantage arises when $B < 1$.

The Balassa index is criticized for neglecting the effects of agricultural policy and it exhibits asymmetric values (Jambor & Gibba, 2017). Trade structure is distorted by various state interventions and trade limitations. The asymmetric value of the B-index reveals that it extends from one to infinity; this is not a problem, except in the case of comparative disadvantage, in which it varies between zero and one, which overestimates a sector's relative weight (Jambor & Gibba, 2017). To overcome the disadvantages of the Balassa index, Vollrath (1991) suggested three specifications of comparative advantage; these are presented in detailed in Vollrath (1991). Also attempting to resolve the asymmetric value problem of the Balassa index, Dalum et al. (1998) transformed the B-index to create the Symmetric Comparative Advantage (RSCA) index:

$$RSCA = (B - 1) / (B + 1) \quad (2)$$

The RSCA index ranges between -1 and 1. Values between 0 and 1 show a comparative export advantage and values between -1 and 0 shows a comparative disadvantage. Since the RSCA distribution is symmetrical and centered on zero, potential bias is avoided (Dalum et al., 1998). Aside calculating comparative advantage, it can also measure stability and duration. In analyzing stability of RSCA index, regression analysis was conducted on the dependent variable, the RSCA index at time t_2 (for sector i and country j), which is tested against the independent variable, RSCA index at time t_1 (equation 2):

$$RSCA_{ij}^{t_2} = \alpha_i + \beta_i RSCA_{ij}^{t_1} + \varepsilon_{ij}, \quad (3)$$

where α and β are linear regression parameters and ε is the residual term. If $\beta = 1$ then there is an unchanged pattern of RSCA between period t_1 and t_2 , which means that there is no change in the overall level of specialization of cashew trade in West African region. If $\beta > 1$, the existing specialization is reinforced, which means that low level of specialization in the initial period leads less specialization in the future, which is called β divergence (Bojnec & Ferto, 2008)? However, if $0 < \beta < 1$, commodity groups with initial B indices will grow over time, which is called β convergence (Bojnec & Ferto, 2008). Finally if $\beta < 0$ this indicates change in the index sign.

However, it is worth nothing, as Dalum et al. (1998) points out, that $\beta > 1$ is not a necessary condition for the growth of the overall specialization pattern. They argue that

there is a need for further analysis of sufficient conditions for specialization or de-specialization. If R is the correlation coefficient, the pattern of distribution will remain unchanged when $\beta = R$. If $\beta > R$, the degree of specialization has increased (leading to divergence). However, if $\beta < R$, then specialization has decreased (meaning convergence)

Apart from the above estimate, Bojnec & Ferto (2008) recommend survival function, $S(t)$. $S(t)$ uses non-parametric Kaplan-Meier product limit estimator for the product level distribution analysis of the RSCA index. According Bojnec & Ferto (2008), the sample contains n independent observation denoted as t_i, c_i , where $i = 1, 2, \dots, n$; t_i is the survival time while c_i is the censoring variable C of observation I ($C=1$ if a failure occurred, and 0 otherwise). In addition, it is presume that the failure times recorded are $m < n$. Then we indicate the orderly times of survival as $t(1) < t(2) < \dots < t(m)$. Let d_j denote the number of failure observed, n_j the number of subjects at risk of $t(j)$ failure. The estimator of The Kaplan-Meier survival function is then with the convention that $\hat{S}(t) = 1$ if $t < t(1)$:

$$\hat{S}(t) = \prod_{t(i) < t} \frac{n_j - d_j}{n_j} \quad (4)$$

In addition, two non-parametric tests, log-rank testing and Wilcoxon testing monitor the equality of survival functions. The first thing is the Log-rank test as $E_{ij} = n_{ij}d_j/n_j$, the anticipated number of group i failures at time t_j is based on null hypothesis that there is no difference in survival between r groups. The X^2 -test statistics is measured as a quadratic of $\hat{u}V^{-1}$ using a row vector:

$$\hat{u} = \sum_{j=1}^k W(t_j)(d_{ij} - E_{ij}, \dots, d_{ij} - E_{ij}) \quad (5)$$

This study is based on export data as per HS-classification, the global cashew nut trade data is sourced from World Bank (2018) World Integrated Trade Solution database at HS-6 levels and covers 10-year period from 2008 to 2017 with the following product codes involved: 080131 and 080132 (cashew nuts, in shell and cashew nuts, shelled) across West African countries. The selected cashew producers include Benin, Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Nigeria and Senegal. These countries are the most important market players in West Africa cashew trade; therefore, utilizing duration analysis and Kaplan-Meier survivor rates, the authors have investigated how their competitive performance has change overtime. The study focuses on the export side of revealed comparative advantage index (B or RCA index) to exclude imports which are more likely to be influence by agricultural policy intervention.

Analysis and Discussion

Descriptive Statistics

Cashew production has reached nearly 790 000 metric tons (kernel basis) in the 2017/2018 season, 32 per cent higher than previous decade average (INC, 2017), West Africa led the production, representing 43 per cent of the world's share: nearly 48 per cent of this crop was produced in Cote d'Ivoire, followed by Guinea-Bissau and Nigeria, which produced 16 percent and 13 per cent respectively of the region's share. Tanzania accounted for 75 per cent of the East Africa region's cashew crop. As for production in the individual countries, India and Vietnam were the first and third producing counties, while Cote d'Ivoire ranked second, as well as being the top processor countries of raw cashew nuts (INC, 2017).

As for world cashew exports, Vietnam and India accounted for 73 per cent of the world's share. They are also major importers of raw cashew nuts (RCN), mainly from Eastern and Western African regions, due to their processing capacity. In 2016, 75 per cent and 24 per cent of India's RCN imports came from Western and Easter Africa, respectively. Alike, Vietnam imported 55 per cent of its share from Western Africa and 27 per cent from Eastern Africa., while Brazil also a processor country imported 100 per cent of its RCN from West Africa.

In the period analyzed, West African 10 top cashew exporters accounted for about 26% all the products exported. Furthermore, the top 10 counties showed 77% of concentration of raw cashew exported (RCN) and about 2% of shelled cashew nuts (Table 1). Cote d'Ivoire, Ghana, Guinea-Bissau and Nigeria, are considered the market leaders, in the West African market and Cote d'Ivoire in the global market as well (Table 2). The export share of the top ten cashew

Table 1. Top 10 exporters of cashew nuts in West Africa, 2008-2017, by country (in 1000US\$)

Country	080131	080132	Total
Benin	717 414.00	22 133.00	739 547
Burkina Faso	498 870.00	55 077.00	553 947
Cote d'Ivoire	4 888 028.00	251 096.00	5 139 124
Gambia	30 195.00	186.00	30 381
Ghana	2 131 884.00	98 381.00	2 230 265
Guinea	278 902.00	7703.00	286 605
Guinea-Bissau	1 546 324.00	4756.00	1 551 080
Mali	19 380.00	407.00	19 787
Nigeria	998 664.00	19 877.00	1 018 541
Senegal	15,559.00	505.00	16 064
Concentration	77%	2%	26%

Source: Own calculation based on FAOSTAT (2018) data

Table 2. The export share of West African top ten cashew exporters, 2008-2017 (in 1000US\$)

Country	Cashew export	Cashew export share in proportion of world cashew export, %	Cashew export share in proportion of W/A cashew export, %	Rank
Cote d'Ivoire	5 139 124	11.38	44.38	1
Ghana	2 230 265	4.94	19.26	2
Guinea-Bissau	1 546 324	3.42	13.35	3
Nigeria	1 018 541	2.26	8.80	4
Benin	739 547	1.64	6.39	5
Burkina Faso	553 947	1.23	4.78	6
Guinea	286 605	0.63	2.47	7
Gambia	30 381	0.07	0.26	8
Mali	19 787	0.04	0.17	9
Senegal	16 064	0.04	0.14	10
Top 10 total	11 585 341	26.00	99.8	10

Source: Own composition based on FAOSTAT (2018) database

nuts exporters accounted for 99.8% of West African export and 26% of world export during that period 2008 to 2017. Furthermore, Figure 3 shows that the export amount of top 10 West African exports has increased six fold in the past ten years. In addition, Figure 4 illustrates increased export share of West African cashew has more than double in the world market from 13.98% to 29.76% during the period. Moreover, the authors' results have highlight that West African countries despite tremendous increase in production are still exporting raw cashew nuts thus losing substantial wealth and employment opportunities.

Analyzing the changes of RCA indices indicates that Benin, Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, and Nigeria were able to increase or maintain their trade competitiveness, while the advantages of Senegal has fallen (Figure 1). Thereby, indicating that at the end of this period West African countries remain globally competitive.

Comparative advantages for Benin, Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea – Bissau, Mali and Nigeria was observable ($RCA > 1$ and $RSCA > 0$) in the period analyzed. On the contrary, only Senegal accounted for negative indices, indicating comparative disadvantages (Figure 2). In conclusion, cashew producers in the West Africa have increased their competitiveness in the global cashew market.

Stability and duration of comparative advantages

In this section the authors analyzed the duration and stability of the comparative advantages of West African top

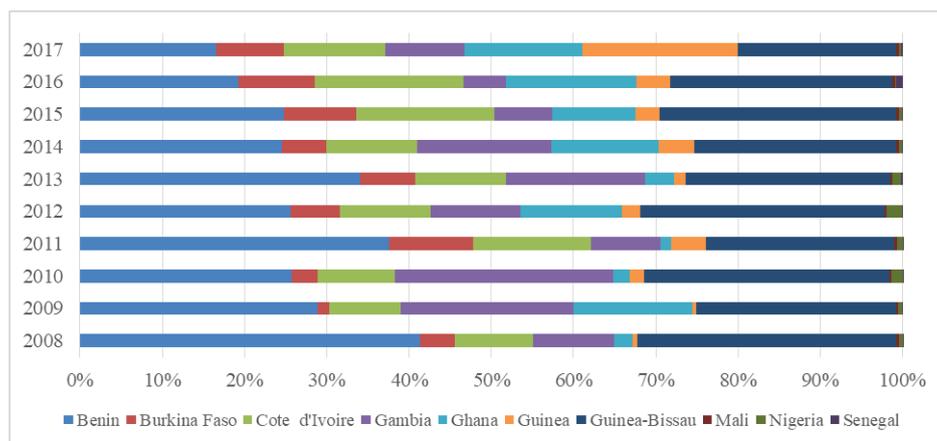


Fig. 1. Changes of RCA indices of West African top cashew exporters, by year

Source: Own calculation based on data from WITS (2018)

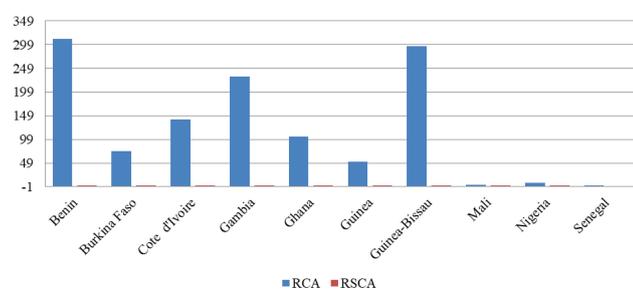


Fig. 2. Comparative advantages of West African Top 10 cashew producers, mean, 2008-2017

Source: Own calculation based on FAOSTAT (2018) data

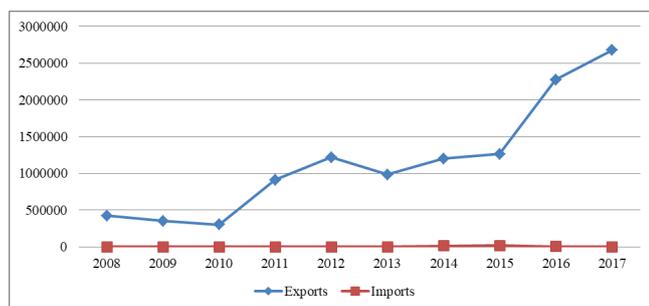


Fig. 3. Cashew trade of West African cashew exporters in the world market, 2008-2017, (in 1000US\$)

Source: Own calculation based on FAOSTAT (2018) data

10 cashew exporters by applying lagged indices and Kaplan-Meier survival functions. Equality of survival functions across countries has been analyzed using Wilcoxon and Log-rank non-parametric tests. These tests exclude the import side of and, due to its symmetrical nature. The authors selected the RSCA index (equation 2) to test stability and durability indices.

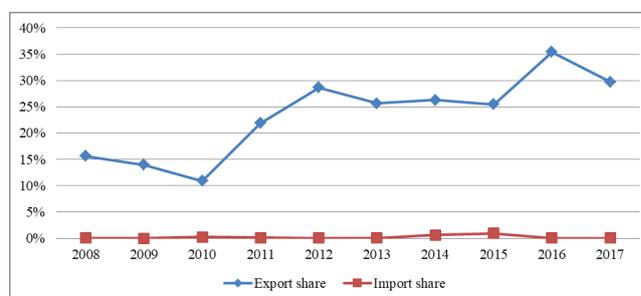


Fig. 4. Cashew export and import share of the top West African cashew exporters, 2008-2017

Note: In percentage of world cashew trade

Source: Own calculation based on FAOSTAT (2018) data

Running the regression on lagged variables of RSCA indices shows that estimated β values were generally between 0 and 1, which is referred to as β convergence, with increasing tendency over time indicating that the existing specialization is strengthened, meaning low level of specialization at the initial periods (Bojniec & Ferto, 2008). The estimated β were greater than the correlation coefficient (R) for the entire period. This confirms that the degree of specialization in West African countries has increased (leading to divergence) in the world cashew market (Table 3).

Regarding the duration of comparative advantages of West African cashew trade, duration was estimated using non-parametric Kaplan Meier product limit estimator. As described in the methodology, following the use of equation 4 on the panel data set, results confirmed that in general, comparative advantages in West African region cashew exporters did persist over the period analyzed (Table 4). Chances of survival just fell from 99.00 per cent at the beginning of the period to 89.31 per cent by the end of

Table 3. Stability of RSCA index 2008 to 2017

Lag	A	B	P-value	R ²	R	β/R	N
1	0.042	0.902	0	0.702	0.814	1.105	100
2	0.041	0.921	0	0.709	0.842	1.094	90
3	0.038	0.922	0	0.711	0.843	1.094	80
4	0.034	0.931	0	0.747	0.864	1.077	70
5	0.548	0.907	0	0.725	0.852	1.065	60
6	-0.010	0.968	0	0.751	0.867	1.117	50
7	0.033	0.924	0	0.772	0.879	1.052	40
8	0.108	0.835	0	0.722	0.850	0.983	30
9	0.196	0.718	0	0.537	0.733	0.979	20
10	-0.808	1.887	0	0.917	0.957	1.971	10

Source: Own calculation based on data from WITS (2018)

Table 4. Kaplan –Meier survival rate of RSCA indices and test for quality of survival functions, by West Africa top ten exporters, 2008-2017

Year	Survival function	Benin	Burkina Faso	Cote d'Ivoire	Gambia	Ghana	Guinea	Guinea-Bissau	Mali	Nigeria	Senegal
2008	0.9900	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.900
2009	0.9900	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.900
2010	0.9776	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.7875
2011	0.9637	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.6750
2012	0.9476	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.5625
2013	0.9476	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.5625
2014	0.9239	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.4219
2015	0.8931	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.2813
2016	0.8931	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.2813
2017	0.8931	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.2813
Log-rank test	0.000										
Wilcoxon test	0.000										

Source: Own calculation based on data from WITS (2018)

the period analyzed, suggesting weak competition in West African cashew trade. Furthermore, it is worth noting that the top 10 West African cashew exporters were able to preserve their comparative advantages. Benin, Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, and Nigeria remained stable while the competitiveness of Senegal declined significantly from 90.00 per cent at the beginning of the period to 28.13 per cent by the end of the period analyzed.

Equality of the survival functions across the top 10 West Africa countries were checked using Wilcoxon and

Log-rank tests. Results of the tests show that the hypothesis of equality across the survivor functions can be rejected at the 1 per cent level of significant, meaning that similarities in the duration of comparative advantage across the top 10 West African cashew exporters are absent (Table 4).

Conclusions

Undoubtedly, cashew nut in West Africa has slowly become the crop of the moment. West Africa is now the larg-

est producer of raw cashew nuts accounting for more than half of the world's production, while processing is still a challenge. West African 10 top cashew exporters accounted for about 26% all the products exported. Furthermore, the top 10 counties showed 77% of concentration of raw cashew exported (RCN) and about 2% of shelled cashew nuts. However, despite the growing competition from Asia and East Africa, the West Africa remains a market leader of global export. For this reason, it is important to evaluate how the export competitiveness of the top West African producers have change over time, and how could they preserve their global competitiveness.

The study analyzed the competitiveness of cashew in global trade, giving special attention to its duration and stability by observing changes in the RSCA indices between 2008 and 2017. The paper has reached a number of conclusions. The results show that Benin, Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Nigeria and Senegal accounted for a remarkable surplus of trade, likewise their trade competitiveness strengthened during the period analyzed. In addition, all of the 10 top West African cashew exporters in the study had comparative advantage in the world market with the exception of Senegal. Furthermore, as the evidenced by the distribution of comparative advantage indices, by the stability tests of lagged indices, and by the Kaplan-Meier survival estimate, these advantages have strengthened for all of the countries, demonstrating steady comparative advantages over time.

While the results are encouraging for cashew export in West Africa especially export of raw cashew nuts in spite of challenges of reduced yields due to aging cashew tree stocks, farmers' limited technical and financial capacity to rehabilitate and renovate aging orchards, and an undeveloped nursery sector unable to provide timely and consistent high-performance seedlings to offset declines in productivity. However, West Africa should devote more effort to increasing their technical efficiency to transform raw cashew nuts into value added products to gain from international trade and maintain their competitiveness. Also, there is the need for West African countries to develop more coherent regional trade and investment policies to solicit public and private-sector support for cashew grower/seller advocacy efforts.

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