
Competitive Status of Africa's Cocoa Products in the World Market

Sadiq M S^{1&2*}, Singh I P¹, Lawal M³, Danjuma B⁴

1 Department of Agricultural Economics, SKRAU, Bikaner, India

2 Department of Agricultural Economics, FUT, Minna, Nigeria

3 Department of Agricultural Education, Federal College of Education Katsina, Nigeria

4 Department of Economics, UNIJOS, Jos, Nigeria

Email: *sadiqsanusi30@gmail.com

Abstract: *To formulate efficient and articulated future cocoa policy prescriptions, and ensure the continuous contribution of the subsector to poverty reduction, income generation and growth of Africa's agricultural sector, the present research empirically examined the global competitiveness of Africa's cocoa export during the spanning period of 2000-2013. The used dated data were sourced from FAO and UNCTAD databases. Export trends and indices of the revealed comparative advantage, as well as Trade Mapping (TM), were examined for cocoa beans, cocoa butter, cocoa paste and cocoa powder/cake. Empirical findings showed that Africa has only revealed comparative and competitive advantages in the exportation of cocoa primary product and disadvantage in the comparative and competitive status in the exportation of its secondary cocoa products. Furthermore, Africa is among the winner group with it controlling a large chunk of the market despite the decline in the export market of cocoa during the studied period. Hence, in order to enhance Africa's relative comparative and competitive advantages in the exportation of cocoa products and its continuing presence in the world markets, Africa should improve on the quality of its cocoa products keeping in-view the best marketing grade and standardization for cocoa products in the global market. Also, Africa should invest more in post-harvest technologies to have a breakthrough in the secondary sub-sectors of cocoa via value addition, thus increasing its global share in the market which in turn would enhance its foreign exchange earnings from the exportation of cocoa.*

Key Words: *Competitiveness; Comparative; Cocoa products; Export; Africa*

Introduction

The export sector is considered as a medium for accelerating the economic development as it supports the flow of resources from low productive sectors to high productive sectors, leading to an overall increase in output (Dhiman and Sharma, 2017). According to Feder (1983), as reported by Dhiman and Sharma (2017), exports growth can affect total productivity growth through dynamic spillover effects on the rest of the economy. Some countries were able to witness high economic growth due to the significant pace in the global trade.

Holding firmly to development and sustainability of subsectors on which nation's agriculture strongly depends have been the actions reflected by various regimes in most of the developing countries worldwide. Such actions are reflected in their pursuit of enhancing food security, foreign exchange earnings and poverty minimization through exports as against income draining through imports.

With the global increase in cocoa exports in recent years from 3.133 million MT in the year 2007 to 3.768 million MT in 2011, the role of Africa in global exports of cocoa cannot be overstated. Africa cocoa exports accounted for approximately 77% of world cocoa exports between the aforementioned periods, with Asia-Oceania and America's shares being 16.3 percent and 6.3 percent respectively.

Africa's trade policy should be based on comparative advantage according to the World Trade Organization (WTO)'s Agreement on Agriculture (AoA), under which member countries are required to utilize the benefits of comparative and competitive advantage in the international economy, increasing competition and forcing resources to be allocated more efficiently. From the trade theory point of view, competitive advantage is a more useful concept than comparative advantage. Competitiveness includes market distortions while comparative advantage assumes undistorted markets (Vollrath 1985, Vollrath and Huu 1988). With the gradual reduction in trade barriers led by the process of globalization, more emphasis is now being placed on promoting export competitiveness (Prasad 2004). As a founding member of GATT and signatory to WTO, Africa has accepted both the opportunity for and challenge of trade liberalization. Sequel to this, this paper attempts to measure Africa's cocoa products export competitiveness

in the global markets. Therefore, the objectives of this research were to determine Africa's cocoa export growth and competitiveness in the global markets; compared Africa's cocoa export growth to global demand; and, determine the market structure and extent of diversification of the cocoa sector.

Research Methodology

The study used annual dated time series data sourced from the FAO and UNCTAD databases, spanning from 2000 to 2013. The data covered export value of Africa's cocoa products viz. cocoa beans, cocoa butter, cocoa paste and cocoa powder/cake. The first objective was achieved using revealed comparative advantage (RCA) index, revealed symmetric comparative advantage (RSCA), revealed export advantage (RXA) and revealed trade advantage (RTA). The second objective was achieved using Trade mapping analysis (TMA): and, the last objective was achieved using Herfindahl-Hirschman Index (HHI) and Berry's index of diversification (BID). The empirical models are given below:

Empirical Model

Indexes of Export's Revealed Comparative Advantage

Following Balassa (1965) as cited by Navghan *et al.* (2017); Gupta and Khan (2017); Astaneh *et al.*(2014) the revealed comparative advantage (RCA) is given below:

$$RCA_{ij} = \frac{X_{ij} / \sum X_{ij}}{X_{iw} / \sum X_{iw}} \dots\dots\dots (1)$$

Where;

RCA_{ij} = revealed comparative advantage of i^{th} commodity by country j

X_{ij} = Export of i^{th} commodity by country j

$\sum X_{ij}$ = Total export of i^{th} commodity class by country j

X_{iw} = Export of i^{th} commodity by the world

$\sum X_{iw}$ = Total export of i^{th} commodity class by the world

The numerator represents the commodity structure of the exports from i^{th} country and the denominator represents the product structure of the global market. The range of RCA is between 0 to ∞ . $RCA > 1$ shows sectors in which a country is relatively more specialized and vice versa (the more the value of the index, the greater reliability and the better the given position). In other words, if $RCA > 1$, then the state has a revealed comparative advantage in the commodity; if $RCA < 1$, then the state has a revealed comparative disadvantage in the commodity; and, $RCA = 1$, implies comparative neutrality.

The benefit of comparative advantage index is that it takes into consideration the intrinsic advantage of a particular export commodity as well as the consistency with changes (Batra and Khan, 2009). However, one of the main disadvantages of RCA index is its wide range such that it is too wide to determine the degree of comparative advantage properly (Astaneh *et al.*, 2014). To solve the above problem, Laursen (1998) introduced another form of RCA index using a symmetric or normalized index by a homogeneous transformation called revealed symmetric comparative advantage (RSCA):

$$RSCA_{ij} = (RCA_{ij} - 1) / (RCA_{ij} + 1) \dots\dots\dots (2)$$

These changes range between -1 and +1 so that negative values indicate no advantage and positive values indicate that there is an advantage.

Vollrath (1989; 1991) criticized additional counting of export and, instead introduced an improved constructed version called relative export advantage (RXA) index. This index has been used by many researchers in their studies on export comparative status such as Bentler and Li (2002); Akhtar *et al.*(2009) and Astaneh *et al.*(2014).

$$RXA_{ij} = \frac{X_{ij} / \sum_{1,1 \neq j} X_{i1j}}{X_{iw} / \sum_{1,1 \neq w} X_{i1w}} \dots\dots\dots (3)$$

Where;

RXA_{ij} = revealed export advantage of i^{th} commodity of country j

X_{ij} = Export of i^{th} commodity of country j

$\sum_{1,1 \neq j} X_{i1j}$ = Total export of i^{th} commodity class of country j minus the product considered

X_{iw} = Export of i^{th} commodity of the world

$\sum_{1,1 \neq w} X_{i1w}$ = Total export of i^{th} commodity class of the world minus the product considered.

$$RCA_{ij} \# = \ln RXA_{ij} \dots\dots\dots (4)$$

$RCA_{ij} \#$ is simply the logarithm of the relative export advantage index. A positive value indicates a comparative/competitive advantage, whereas a negative value indicates a comparative/competitive disadvantage.

The mentioned indexes are static. New indexes are expanded which have more consistency with the new conception of competitive advantages. One of them is Trade Map (TM) introduced by International Trade Centre (ITC) and United Nations Conference on Trade and Development (UNCAD) and compares export growth to global demand growth. The groups of export commodities are classified into winners and losers based on *TM* and defined in Table 1. Based on the information in Table 1, if the global growth rate of import of commodity i (r_i) is bigger (less) than the growth rate of aggregated imports, the market of this commodity is identified as emerging (declining) market. If the export growth rate of country j for commodity i^{th} (d_{ij}) is bigger (less) than the import growth rate of this commodity (r_i), the country is a winner (loser) on that commodity.

Table 1: Trade Mapping Coordinates

Coordinate	Property	Decision Rule
First Quarter	$d_{ij} > r_i > r$	Winners in emerging markets
Second Quarter	$d_{ij} < r_i > r$	Losers in emerging markets
Third Quarter	$d_{ij} > r_i < r$	Winners in declining markets
Fourth Quarter	$d_{ij} < r_i < r$	Losers in declining markets

Relative Trade Advantage (RTA): Besides using the exports as a factor, as in Balassa index, this index has also taken into consideration imports. Following Navghan *et al.* (2017) the RTA index is given below:

$$RTA = RXA - RMA \dots\dots\dots (5)$$

$$RTA = \frac{X_{ij} / \sum X_{ij}}{X_{iw} / \sum X_{iw}} - \frac{M_{ij} / \sum M_{ij}}{M_{iw} / \sum M_{iw}} \dots\dots\dots (6)$$

Where; RTA is relative trade advantage; RXA is RCA or Balassa index; and RMA is the relative import advantage.

- M_{ij} = Import of i^{th} commodity by country j
- $\sum M_{ij}$ = Total Import of i^{th} commodity class by country j
- = Import of i^{th} commodity by the world
- M_{iw} = Total Import of i^{th} commodity class by the world

Herfindahl–Hirschman Index (HHI)

Herfindahl-Hirschman index is the sum of the squares of market shares of all active firms in the industry. This index is very similar to Hirschman index except for the square root (Hirschman, 1964), and it is shown below:

$$HHI = \sum_{i=1}^n S_i^2 \dots\dots\dots (7)$$

Where; S_i is the market share of i^{th} subsector in the sector; n is the number of sub-sectors. Types of market structure and characteristics as reported by Williams and Rosen (1999) are presented in Table 2.

Table 2: Market Structure

Market type	HHI	Feature
Perfect Competition	HHI → 0	None of the subsectors have considerable share in the sector
Monopolistic Competition	HHI → 10)	None of the sub-sectors had more than 10% share in the sector
Opened Oligopoly	$6 < (1/HHI) \leq 10$	Few subsectors account for maximally 40% share in the sector
Closed Oligopoly	$1 < (1/HHI) \leq 6$	Few subsectors account for maximally 60% share in the sector
Monopoly	HHI → 10	One subsector account for whole share of a sector

Source: Williams and Rosen (1999)

Diversification Index

However, literature has shown various methods used to measure level and degree of diversification but for the present empirical examination, Berry's index and Theil's Entropy index were used.

$$\text{Berry's Index of Diversification (BID)} = 1 - \sum_{i=1}^n P_{it}^2 \dots\dots\dots (8)$$

$$P_{it} = \frac{A_{it}}{\sum_{i=1}^n A_{it}} \dots\dots\dots (9)$$

Where;

P_{it} = Share contribution of i^{th} sub-sector to the main sector at time 't'

A_{it} = i^{th} Export value of i^{th} sub-sector at time 't'

$\sum_{i=1}^n A_{it}$ = Export value of cotton sector at time 't'

The value of Berry's index varies between zero and one. It is one (1) in case of perfect diversification and zero in case of perfect specialization.

$$\text{Entropy Index of Diversification (EID)} = \sum_{i=1}^n P_{it} \log\left(\frac{1}{P_{it}}\right) \dots\dots\dots (10)$$

The value of Entropy index (E) varies from zero to $\log n$. 'EID' takes the value of zero in case of perfect specialization and $\log n$ when there is perfect diversification.

The actual degree of diversification to maximum diversification for a given sector can be measured through Berry's index as given below:

$$\text{Degree of diversification by Berry's Index} = \text{Berry's Index} / \left(1 - \frac{1}{n}\right) \dots (11)$$

$$\begin{aligned} &\text{Degree of diversification by Entropy Measure} \\ &= \text{Entropy Index} / \log n \dots\dots\dots (12) \end{aligned}$$

Where;

n = number of sub-sectors in the agriculture sector

Rule of Thumb:

0	=	specialization
0.01-0.19	=	Very low diversification
0.20- 0.39	=	Low diversification
0.40-0.59	=	Moderate diversification
0.60-0.79	=	High diversification
0.80-0.99	=	Very high diversification
1.00	=	Perfect diversification

Results and Discussion

Africa's Cocoa Export Status during the Period of 2000-2013

A perusal of Table 3 showed that of the total value of Africa's cocoa products, cocoa beans accounted for 81.95%, distantly followed by cocoa paste which contributed 8.68%, then cocoa butter with share contribution of 7.15% and cocoa powder/cake with marginal share contribution of 2.23% during the studied period. Therefore, it can be inferred that the main share of Africa's cocoa export has been accounted by cocoa bean which is not surprising as the continent's export concentration on cocoa products is beamed towards cocoa beans. Also, the continent is faced with challenges of post-harvest technologies needed for value addition of cocoa raw material, thus, the reason for exporting most of its cocoa as a primary product i.e. in its raw form rather than as secondary products i.e. the processed form which will yield varieties of cocoa products.

The total export value of Africa's cocoa beans during the studied period was \$51.9 billion with the export growth been marked by fluctuation. Furthermore, the average annual growth rate of cocoa beans was observed to be 10.34% and showed positive growth over the time. The export value of cocoa paste, cocoa butter and cake were \$5.4 billion, \$4.5 billion and \$1.4 billion respectively, and all had positive average annual growth over the studied period. In total, Africa's cocoa export value stood at \$63.3 billion with an annual average growth value of 10.76% during the studied period. Furthermore, the cocoa product with the highest average annual export growth is cocoa powder, followed by cocoa butter, then cocoa paste and lastly cocoa beans. The high annual average growth rate for cocoa powder

Table 3: Growth and Export Value ('000 dollars) of Africa's Cocoa Export

Years	Beans		Butter		Paste		Powder/Cake		Total cocoa		World share %
	Value	Growth	Value	Growth	Value	Growth	Value	Growth	Value	Growth	
2000	1568765	-	100386	-	129767	-	25848	-	1824766	-	42.43
2001	1761084	12.26	117483	17.03	198533	52.99	27007	4.483	2104107	15.31	45.37
2002	2721446	54.53	205242	74.69	311694	56.99	71559	164.97	3309941	57.31	46.63
2003	3070139	12.81	264964	29.09	327185	4.96	111694	56.09	3773982	14.02	44.68
2004	3080101	0.32	260470	-1.69	287969	-11.99	88472	-20.79	3717012	-1.51	40.69
2005	3002683	-2.51	292779	12.40	297558	3.33	58956	-33.36	3651976	-1.75	39.37
2006	3184218	6.05	302285	3.25	344868	15.89	62996	6.85	3894367	6.64	41.36
2007	3073924	-3.46	349641	15.67	396070	14.85	77491	23.01	3897126	0.07	36.96
2008	3768998	22.61	403958	15.54	456631	15.29	81864	5.64	4711451	20.89	36.07
2009	5223464	38.59	461636	14.28	503314	10.22	124488	52.07	6312902	33.99	41.62
2010	4917432	-5.86	479713	3.92	622816	23.74	188618	51.52	6208579	-1.65	35.56
2011	6832623	38.95	487685	1.66	584756	-6.11	183174	-2.89	8088238	30.28	41.24
2012	5366600	-21.45	340004	-30.28	469397	-19.73	145983	-20.30	6321984	-21.4	39.32
2013	4375316	-18.47	462536	36.04	569391	21.30	164335	12.57	5571578	-11.87	36.45
Mean		10.34		14.72		13.98		23.07		10.76	40.41

is attributed to wide fluctuation in the export volume of this product due to intensive post-harvest technologies requirement which is highly limited in Africa, thus reflecting its effect in the export value of cocoa powder. The marginally higher annual average growth rate than the cocoa beans observed for cocoa butter and paste is attributed to stability in the export volume which is reflected in the export value as post-harvest technologies required for their value addition is not highly intensive, while the stable average annual growth rate for cocoa bean is attributed to stability in the export volume of the product given that exportation of the commodity is done in its raw form. Furthermore, the average share of Africa in the world export of cocoa products is 40.41%, indicating the moderate share of Africa in the global market due to low quality in the international market and moderate domestic consumption.

Comparative Advantage of Africa's Cocoa Products

Presented in Table 4 are the export's revealed comparative advantage of Africa's cocoa products calculated by RCA, RSCA, RXA and RTA during the studied period. The results showed that Africa has revealed comparative

Table 4a: Comparative Advantage Indices of Africa's Cocoa Export During 2000-2013

Product	Index	2000	2001	2002	2003	2004	2005	2006	2007
Beans	RCA	1.667449	1.570805	1.474658	1.573768	1.715637	1.728238	1.632292	1.675653
	RSCA	0.25022	0.222033	0.191807	0.222929	0.263525	0.266926	0.240206	0.252519
	RCA#	1.750513	1.504371	1.300102	1.405245	1.644121	1.628457	1.496809	1.434754
	RTA	1.457226	1.205358	0.839965	0.831528	1.190401	1.304924	1.175431	1.227995
Butter	RCA	0.20925	0.240974	0.306374	0.336551	0.288617	0.26286	0.261729	0.288242
	RSCA	-0.65392	-0.61164	-0.53095	-0.49639	-0.55205	-0.58371	-0.58513	-0.5525
	RCA#	-1.81268	-1.62919	-1.34507	-1.25018	-1.44813	-1.6164	-1.61144	-1.52284
	RTA	-3.00616	-2.9618	-1.99238	-1.8981	-2.37269	-2.99734	-2.80898	-3.2581
Paste	RCA	0.784707	0.892092	0.916333	0.829983	0.810683	0.893229	0.887795	0.939391
	RSCA	-0.12063	-0.05703	-0.04366	-0.09291	-0.10456	-0.0564	-0.05944	-0.03125
	RCA#	-0.26367	-0.12687	-0.09691	-0.20599	-0.22968	-0.12357	-0.13137	-0.06985
	RTA	-1.37613	-1.59011	-1.3709	-1.08072	-1.30119	-1.28309	-1.46312	-1.61914
Product	Index	2008	2009	2010	2011	2012	2013	Mean	
Beans	RCA	1.742265	1.573929	1.695765	1.722181	1.767098	1.751727	1.663676	
	RSCA	0.270676	0.222978	0.258096	0.265295	0.277221	0.273184	0.248401	
	RCA#	1.549833	1.464577	1.469173	1.732017	1.804356	1.504335	1.54919	
	RTA	1.221789	1.240868	1.316241	1.574858	1.634825	1.295815		
Butter	RCA	0.261528	0.283259	0.331883	0.328752	0.323512	0.369938	0.292391	
	RSCA	-0.58538	-0.55853	-0.50163	-0.50517	-0.51113	-0.45992	-0.54915	
	RCA#	-1.64884	-1.48408	-1.28758	-1.25288	-1.25505	-1.16188	-1.45187	
	RTA	-2.5358	-2.47077	-2.36279	-2.0623	-2.04733	-1.79465		
Paste	RCA	0.90156	0.747863	0.829926	0.619913	0.626746	0.761185	0.817243	
	RSCA	-0.05177	-0.14425	-0.09294	-0.23463	-0.22945	-0.1356	-0.10389	
	RCA#	-0.11542	-0.32018	-0.20953	-0.52714	-0.51616	-0.30924	-0.23183	
	RTA	-1.71137	-2.13636	-1.40944	-1.78746	-1.45126	-1.26759		

Table 4b: Comparative Advantage Indices of Africa's Cocoa Export During 2000-2013

Product	Index	2000	2001	2002	2003	2004	2005	2006	2007
Powder/Cake	RCA	0.108225	0.098966	0.157479	0.17407	0.133239	0.126081	0.157415	0.181042
	RSCA	-0.80469	-0.81989	-0.72789	-0.70348	-0.76485	-0.77607	-0.72799	-0.69342
	RCA#	-2.34956	-2.43897	-1.97428	-1.90461	-2.18831	-2.19157	-1.941	-1.80529
	RTA	-6.23842	-5.44351	-5.37864	-4.88724	-5.06186	-5.21012	-5.56014	-4.9184
Total Cocoa	RCA	12.91713	14.00559	14.14667	12.97224	12.0484	12.12989	12.87444	12.70168
	RSCA	0.856292	0.866716	0.867958	0.856859	0.846725	0.847676	0.85585	0.854033
	RCA#	2.693232	2.798694	2.890539	2.780523	2.673708	2.67031	2.726081	2.696092
	RTA	2.497604	2.597559	2.698269	2.582458	2.471259	2.488774	2.564367	2.535509
Product	Index	2008	2009	2010	2011	2012	2013	Mean	
Powder/Cake	RCA	0.164691	0.180045	0.169488	0.108126	0.098298	0.152795	0.143569	
	RSCA	-0.71719	-0.69485	-0.71015	-0.80485	-0.821	-0.73491	-0.75009	
	RCA#	-1.89765	-1.81063	-1.94166	-2.43658	-2.56415	-2.0632	-2.10768	
	RTA	-6.48564	-6.69106	-7.00562	-7.64636	-7.82025	-7.59205		
Total Cocoa	RCA	12.43042	11.64385	10.79432	12.09694	12.16716	10.24945	12.36987	
	RSCA	0.851084	0.84182	0.830427	0.847293	0.848107	0.822213	0.849504	
	RCA#	2.672834	2.644143	2.553658	2.676099	2.644774	2.435223	2.682565	
	RTA	2.513945	2.480257	2.366236	2.501355	2.428323	2.233866		

and positive competitive advantage in the exportation of cocoa beans and revealed comparative and competitive disadvantage in the exportation of the rest of the cocoa products which are in secondary form during the studied period as indicated by RCA greater than unity, positive RSCA and RXA values for the former and vice versa for the latter. These results are not surprising as the continent specialized more in the exportation of the raw product or primary product (cocoa beans) due to inadequacy of post-harvest technologies in most of the exporting countries in the country due to capital paucity. Furthermore, the results of the overall cocoa sector for the continent showed that Africa had revealed comparative and competitive advantage in the exportation of cocoa during the studied periods as indicated by the positive values for RSCA and RXA. However, the reason for the comparative and competitive advantages of the sector may be attributed to specialization in the exportation of the primary product which triggered Africa's share in the world export volume to be almost 50%. ICCO (2012) reported that out of the five major cocoa export countries in the world, four (Ivory Coast, Ghana, Nigeria and Cameroon) are from Africa with an approximate net export of cocoa beans plus net exports of cocoa products converted to bean equivalent to be 72.3%.

The cursory review of Africa's share of global cocoa exports showed changes in the export values of cocoa products to be related to changes in RCA, RSCA and RXA's. Consequently, Africa's share of global exports is such that whenever its share of global exports increases (or decreases), the mentioned indices increase (decrease) as well. Thus, Africa can increase its revealed comparative advantage by enhancing its share export in the global market. Investigating comparative advantage index in the export of Africa's cocoa products showed that Africa has the potential to achieve higher comparative and competitive advantages in the exportation of cocoa, as evidenced by its advantage in cocoa beans export over the studied periods. Perhaps, the moderate comparative and competitive advantages are due to low-quality standard of its cocoa and some specific trade policies.

The result of the relative trade advantage (RTA) showed that Africa had relative trade advantage in the exportation of cocoa beans subsector and the cocoa sector as a whole as indicated by the RTA index which showed a positive balance of trade for the cocoa beans subsector and the overall cocoa sector during the studied period. However, the trade balances for the other sub-sectors of the cocoa sector were not favourable as evidenced by the negative values of the RTA index during the studied period. Therefore, the reason for favourable trade balance for cocoa beans is due to specialization

of the continent in the exportation of cocoa as a raw material or in its primary form while the unfavourable balance of trade for the other sub-sectors is due inadequate post-harvest technologies which will add value to these products, thus, the reason for Africa to resort to importation of these products to bridge the wide gap between the domestic demand and supply for processed or secondary cocoa products. In addition, Africa's GDP has been affected as the importation of secondary cocoa products is a drain on its foreign exchange earnings.

Competitive Situation of Africa's Cocoa Products in the Global Markets

Presented in Table 5 are the Trade Mapping and competitive situation of Africa's cocoa products in the global markets. The external factors that may cause the reduction in the comparative advantage of Africa's cocoa exports include the increase in the production of other countries, trade agreements of other countries with the applicant countries for reducing trade barriers thereby increasing the export share, and the problems due to the entry of these goods in the importing countries.

The results of the trade mapping analysis for Africa's total cocoa products' export markets revealed that despite that the export market for these products have declined during the studied period, Africa had taken greater share of the market and is among the winner group. Product-wise analysis showed that the export market for cocoa beans has emerged during the studied period with Africa taken a greater share of the market and is among the winner group. For the cocoa butter, inspite of the fact that Africa controlled a greater share in the market and has been among the winner group, the export market for cocoa butter has declined during the studied period. Unfortunately, results showed Africa to have poor share in the cocoa paste and powder markets which declined during the studied period and is among the loser groups in the export markets of these products. The good trade situations for cocoa beans and cocoa butter in the global markets are not surprising as specialization in the exportation of the primary product or raw material of cocoa triggered the performance of the former and requirement of less intensive technologies enhanced the export performance of the latter. The poor trade situation of Africa in the global markets for cocoa paste and powder/cake is not surprising as the continent paid low attention to secondary products of cocoa due to capital paucity to procure intensive technologies required for value addition for these products.

Table 5a: Trade Mapping Index (TMI) for Africa's Cocoa Export

Product	Growth %	2000	2001	2002	2003	2004	2005	2006	2007
Beans	WIG	-	4.257045	42.91366	40.32286	-2.56036	5.623671	2.238169	19.50024
	WCIG	-	6.771803	41.5827	41.43135	-7.6101	4.397586	4.79461	19.34734
	ACEG	-	12.25926	54.53244	12.81278	0.32448	-2.51349	6.04576	-3.46377
	Assessment	-	LDM	WDM	LEM	WDM	WEM	WEM	LDM
Butter	WIG	-	4.257045	42.91366	40.32286	-2.56036	5.623671	2.238169	19.50024
	WCIG	-	-8.25199	28.21195	32.00514	14.52415	29.79489	0.777786	17.45317
	ACEG	-	17.03126	74.69932	29.09833	-1.69608	12.40412	3.246818	15.66601
	Assessment	-	WDM	WDM	WEM	LEM	LEM	LEM	WDM
Paste	WIG	-	4.257045	42.91366	40.32286	-2.56036	5.623671	2.238169	19.50024
	WCIG	-	18.88054	62.20167	26.5309	-3.29305	1.069652	9.668105	28.25162
	ACEG	-	52.9919	56.99858	4.969938	-11.9859	3.329872	15.89942	14.84684
	Assessment	-	LDM	LEM	WEM	WEM	WEM	WDM	LDM
Product	Growth %	2008	2009	2010	2011	2012	2013	Mean	
Beans	WIG	26.02151	4.809182	18.50053	11.98267	-19.5698	-3.03472	10.78605	
	WCIG	25.8908	10.44511	11.15253	12.94809	-22.436	-9.2834	9.959458	
	ACEG	22.61194	38.59026	-5.85879	38.94697	-21.4562	-18.4714	9.597161	
	Assessment	WEM	LDM	WEM	LDM	WEM	WEM	WDM	
Butter	WIG	26.02151	4.809182	18.50053	11.98267	-19.5698	-3.03472	10.78605	
	WCIG	31.46222	-9.96614	-0.66434	-11.7651	-28.6454	35.12481	9.290082	
	ACEG	15.53508	14.27822	3.915856	1.661827	-30.282	36.0384	13.68551	
	Assessment	LEM	WDM	WDM	WDM	WEM	LEM	WDM	
Paste	WIG	26.02151	4.809182	18.50053	11.98267	-19.5698	-3.03472	10.78605	
	WCIG	24.29229	3.912545	35.11701	13.35683	-17.5703	9.77351	15.15652	
	ACEG	15.29048	10.22335	23.74303	-6.11095	-19.7277	21.30265	12.98368	
	Assessment	WEM	WDM	LEM	LEM	LEM	LDM	LEM	

Table 5b: Trade Mapping Index (TMI) for Africa's Cocoa Export

Product	Growth %	2000	2001	2002	2003	2004	2005	2006	2007
Powder/Cake	WIG	-	4.257045	42.91366	40.32286	-2.56036	5.623671	2.238169	19.50024
	WCIG	-	10.71979	60.17555	58.2627	-6.45637	-22.6688	-10.75	17.34841
	ACEG	-	4.483906	164.9646	56.08659	-20.7907	-33.362	6.852568	23.0094
	Assessment	-	LEM	LDM	LEM	WEM	WEM	WDM	WDM
Total Cocoa	WIG	-	2.0052	5.316572	18.56897	15.71268	6.493625	10.89519	21.12736
	WCIG	-	4.257045	42.91366	40.32286	-2.56036	5.623671	2.238169	19.50024
	ACEG	-	15.30832	57.30859	14.01962	-1.50955	-1.74968	6.637256	0.070846
	Assessment	-	LDM	LDM	LEM	WDM	WDM	WDM	WEM
Product	Growth %	2008	2009	2010	2011	2012	2013	Mean	
Powder/Cake	WIG	26.02151	4.809182	18.50053	11.98267	-19.5698	-3.03472	10.78605	
	WCIG	13.63459	21.49646	83.75427	38.13547	-6.31789	-20.4723	16.9187	
	ACEG	5.643236	52.06684	51.51501	-2.88626	-20.3036	12.57133	21.41792	
	Assessment	WEM	LDM	LEM	LEM	LEM	WDM	LDM	
Total Cocoa	WIG	22.48036	-11.6676	12.07585	22.54284	0.947175	4.342763	9.345781	
	WCIG	26.02151	4.809182	18.50053	11.98267	-19.5698	-3.03472	10.78605	
	ACEG	20.89553	33.99061	-1.65254	30.27519	-21.8373	-11.8698	9.991934	
	Assessment	LEM	LDM	LEM	WDM	WEM	WDM	LEM	

Note: WIG (World import growth %); WCIG (World cocoa import growth %); and, ACEG (Africa's cocoa export growth %)

Market Structure of Africa's Cocoa Products

A perusal of the Table showed the export market structure of Africa's cocoa to be monopolistic over the studied period (Table 6). This outcome is not surprising as Africa adopts different marketing strategies ranging from grading to standardization for their cocoa products especially cocoa beans so that they can have a good cut in the global market of cocoa. The results showed that the cocoa sector of Africa has low diversification owing largely to concentration on the exportation of the product in its primary form due to inadequate post-harvest technologies required for enhanced value addition. Therefore, the study suggested the need for more investment in post-harvest technologies in order to have comparative and competitive advantages in the exportation of the secondary cocoa products thereby increasing its global share in the cotton markets and maximization of foreign exchange earnings from the exportation of its cocoa products.

Table 6: Export Trade Structure of Africa's Cocoa

Year	Market structure	1/HHI	BID	EID	DBID	DEID
2000	Monopolistic Competition	1.338005	0.252619	0.336825	0.23356	0.168478
2001	Monopolistic Competition	1.403092	0.287288	0.383051	0.25567	0.184427
2002	Monopolistic Competition	1.450959	0.310801	0.414401	0.277408	0.200107
2003	Monopolistic Competition	1.48125	0.324895	0.433193	0.291232	0.21008
2004	Monopolistic Competition	1.432378	0.30186	0.402481	0.27324	0.197101
2005	Monopolistic Competition	1.450637	0.310648	0.414197	0.275424	0.198677
2006	Monopolistic Competition	1.464825	0.317324	0.423099	0.279855	0.201872
2007	Monopolistic Competition	1.560241	0.359073	0.478764	0.309979	0.223602
2008	Monopolistic Competition	1.52209	0.343009	0.457345	0.297827	0.214837
2009	Monopolistic competition	1.435281	0.303272	0.404363	0.272335	0.196448
2010	Monopolistic Competition	1.552118	0.355719	0.474292	0.312395	0.225345
2011	Monopolistic Competition	1.383135	0.277005	0.369339	0.255172	0.184068
2012	Monopolistic Competition	1.370738	0.270466	0.360621	0.250309	0.18056
2013	Monopolistic Competition	1.575078	0.365111	0.486814	0.318525	0.229768

Conclusion and Recommendations

Empirical evidence showed that Africa has revealed comparative and competitive advantages in the exportation of cocoa if considered from the sector point of view with the primary product has been the principal sub-sector that gave the continent trade edge advantage in the global cocoa markets. However, from the sub-sector point of view, it was observed that Africa had only revealed comparative and competitive advantage in the exportation of cocoa beans due to specialization owing to less use of intensive technology as the product is virtually in its raw or primary form. While for the secondary products which required intensive technologies for conversion, evidence showed Africa to be comparative and competitive disadvantaged in the exportation of these products due to capital paucity which is a barrier to the availability of adequate post-harvest technologies required for value addition to the primary cocoa product.

Furthermore, it can be inferred that the competitive situation of Africa's cocoa in the global market is good as it controlled a large share of the market and is among the winner group despite a decline in the export market for cocoa products during the studied period. Therefore, the following recommendations were made:

1. There is a need for special attention on productivity enhancement and cost minimization through the adoption of improved varieties, proper mechanization, enhanced quality and production methods as the appropriate solutions to improve the position of Africa's exporting cocoa products amongst commercial competitors.
2. Africa should adopt regulating guarantee prices and tariffs in such a way that their effect on relative prices is taken into account, in order to guarantee efficient production.
3. The commercial production status and behavior of competing countries should be properly monitored by Africa's manufacturers, exporters, and domestic decision-makers to deal with the effects of externalities. Furthermore, timely and appropriate responses should be done to improve the competitive position of these products in the potential target markets.
4. Africa cocoa exporting countries should observe and adhere to the health standards of the targeting importing countries especially European countries

in order to enhance its global share in the world market. This can be achieved by promotional plans and educating farmers according to the international markets, food hygiene legislation for agricultural products, increased investment in the health control laboratories and use of appropriate product packaging materials and product trademarks for the foreign markets.

5. Africa should adopt accurate systematic plan coupled with increased competition and competitiveness, in order to penetrate potential cocoa importing target markets. For this purpose, Africa cocoa exporters should target potential markets and infiltrate them with the awareness of the competitors, rules and regulations of marketing and coherent marketing plan.

References

- Akhtar, W., Sharif, M. and Shah, H. (2009). Competitiveness of Pakistani Fruits in the World Market. *The Lahore Journal of Economics*, 14(2): 125-133
- Astaneh, H.K., Yaghoubi, M. and Kalateharabi, V.(2014). Determining Revealed Comparative Advantage and Target Markets for Iran's Stone Fruits. *Journal of Agricultural Science Technology*, 16: 253-264
- Balassa, B. (1965). Trade Liberalisation and Revealed Comparative Advantage. *The Manchester School of Economic and Social Studies*, 33(2): 99-123.
- Batra, A. and Khan, Z. (2009). Revealed Comparative Advantage: An Analysis for India and China. Indian Council for Research on International Economic Relations (ICRIER), New Delhi, *Working Paper No.* 168.
- Bender, S. and Li, K. W. (2002). The Changing Trade and Revealed Comparative Advantages of Asian and Latin American Manufacture Exports. *Center Discussion Paper No.* 843, Yale University, Economic Growth Center.
- Dhiman, R. and Sharma, M. (2017). Export Competitiveness of Indian Textile Industry: Revealed Comparative Advantage Analysis. *International Journal of Applied Business and Economic Research*, 5(7):295-305
- Feder, G. (1983). On Exports and Economic Growth. *Journal of Development Economics*, 12:59-73.

- Gupta, G. K. and Khan, M. A. (2017). Exports Competitiveness of the Indian Textile Industry During and After ATC. *Journal of Textile Science and Engineering*, 7(5):1-6
- Hirschman, A. O. (1964). The Paternity of an Index. *The American Economic Review*, 54(5): 761- 762.
- International Cocoa Organization (ICCO) (2012).The World Cocoa Economy: Past and Present. EX/146/7
- Laursen, K. (1998). Revealed Comparative Advantage and the Alternatives as Measures of International Speculation. Danish Research Unit for Industrial Dynamic (DRUID), *Working Paper*, No. 98-30.
- Navghan, M., Kumar, N.R., Prakash, S. and Sharma, R.(2017). An Empirical Assessment of Seafood Export Performance and Competitiveness in Gujarat, India. *Asian Journal of Agricultural Extension, Economics and Sociology*, 21(3): 1-11
- Prasad, R. N. (2004). Fiji's Export Competitiveness: A Comparison with Selected Small Island Developing States. *Working Paper 2004/06*, Economics Department Reserve Bank of Fiji.
- Vollrath, T. L. and Huu, V. (1988). Investigating the Nature of World Agricultural Competitiveness, Washington D.C. USDA, ERS.
- Vollrath, T. L. (1985). Dynamics of Comparative Advantage and the Resistance to Free Trade, Washington D. C. USDA, ERS, *Foreign Agricultural Economics Report*, Number 214.
- Vollrath, T. L. (1989). Competitiveness and Protection in World Agriculture. In: *Agriculture Information Bulletin*, Department of Agriculture, Economic Research Service, USA.
- Vollrath, T. L. (1991). A Theoretical Evaluation of Alternative Trade Intensity Measures of Revealed Comparative Advantage. *Weltwirtschaftliches Archive*, 127(2):265-280.
- Williams, E. and Rosen, R. A. (1999). A Better Approach to Market Power Analysis. *Technical Report*, Tellus Institute, USA.