

# ‘PRODUCTS MAPPING’ AND AGRI-FOOD TRADE BETWEEN NIGERIA AND ECOWAS MEMBER COUNTRIES

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## Abstract

Intra-ECOWAS trade and food exports have been debated and given attention in recent years. The paper uses an analytical tool, called ‘products mapping’ following some methods, such as trade balance index, Balassa index and Lafay index to analyse comparative advantages in all 46 food items (SITC 0 + 1 + 22 + 4) in trade between Nigeria and ECOWAS as well as the world. The findings suggest that Nigeria has performed better in trading with other ECOWAS countries than in trading with the overall world market. For Nigeria and the world, the findings reveal that the country’s comparative advantages reduced from 12 out of 46 (12/46) in 1995 to 8/46 food products in 2017. The notable products that reveal comparative advantages and positive TBI are cocoa (SITC 072), crustaceans (SITC 036), fruits and nuts (SITC 057); and oil seeds and oleaginous fruits (SITC 222).

Contrary to Nigeria’s trade with the world, the results suggest that the country’s comparative advantages in trading with ECOWAS countries rose from 19/46 in 1995 to 26/46 food products in 2017. The notable products that show comparative advantages and positive TBI are tobacco, edible products, maize and wheat. Inversely, food products with comparative disadvantage and adverse TBI, slightly reduced from 18/46 in 1995 to 17/46 in 2017. The findings further suggest that the structure of Nigeria’s food trade with ECOWAS has started involving and improving, albeit at a slow pace. There is an urgent need to stimulate domestic food production and food processing industries for domestic consumption and exports. Regional and national agricultural policies should be dramatically implemented for self-sufficiency and more comparative advantages and the number of positive TBI to be ensured and sustained.

Keywords: agri-food, comparative advantage, food products, intra-ECOWAS, Lafay index

## INTRODUCTION

Regional integration and trade liberalisation in African countries have been a long-standing agenda on the continent (Okolo, 1989; Foroutan and Pritchett, 1993; Mou, 2014; UNCTAD, 2018). The targets have been considered to offer a mutual

distribution of trade benefits and boost economic growth and development within the region, which has been lagged behind in the community of nations (Hollinger and Staatz, 2015; Verter, 2017). Notwithstanding, regional integration is tedious tasks that need the cooperation of interesting blocs or countries.

The west African countries are highly diverse in terms of natural resource endowments, market size, population densities, agroclimatic conditions, and economic policies. Also, the number of non-tariff measures (NTMs), such as sanitary and phytosanitary measures (SPS) in food products varies across the ECOWAS countries, especially in Ghana, Cabo Verde and Nigeria, which may have distorted market signals in the region (UNCTAD, 2018). Despite these differences, wide drivers and trends have shaped consumer demand for food in the region. Market opportunities for the ECOWAS food producers are increasingly dynamic occasioned by income and population growth, urbanisation, dietary diversification and higher output prices (Hollinger and Staatz, 2015; Staatz and Hollinger, 2016).

To foster regional economic integration, stimulate industrialisation and economic growth, especially in the agricultural sector in West Africa, the Economic Community of West African States (ECOWAS)<sup>1</sup> was established in 1975. In line with the regional economic community (REC), which was launched more than four decades ago, the community aimed at abolishing tariffs and reducing NTMs that either distort trade signals or hinder competition within the region (Okolo, 1989; Shuaibu, 2015; Staatz and Hollinger, 2016). Some of these NTMs are implemented for essential reasons, such as ensuring sanitary conditions and health safety, preventing custom tax evasion and protecting the environment. Nevertheless, the NTMs are perceived as the main obstacles for regional integration and intra-ECOWAS trade (Shuaibu, 2015; Blizkovsky *et al.*, 2018; UNCTAD, 2018).

The ECOWAS Treaty was reformed in 1993, to fasten the integration process as well as establish an economic and a single monetary union (Shuaibu, 2015), eliminate customs duties on the intra-ECOWAS trade, and establish a Common External Tariff (CET), in consonance with the broad-based ETLs (ECOWAS Trade Liberalization Scheme), policy harmonization (Shuaibu, 2015). Presently, ECOWAS is a free-trade zone which, with the harmonised CET. However, some of the initial agreements have not been fully implemented by ECOWAS member countries.

Undoubtedly, the agricultural sector is the primary source of employment, export and economic growth in ECOWAS member countries, such as Nigeria (World Bank, 2019), food production and trade have remained minimal (FAO, 2018). Achieving food self-sufficiency and food security have remained a tedious task for many member countries (EIU, 2018).

Given that Nigeria is the ECOWAS most populous and the largest economy (World Bank, 2019), and total regional trade have been heavily impacted by the performance of Nigeria, as it produces 50% or more of the community's volume of many agricultural products (Staatz and Hollinger, 2016; UNCTAD, 2018), this study focuses on Nigeria.

Recently, agri-food production in Nigeria just as in many ECOWAS member countries has also faced severe constraints, such as unstable rainfall, climate change, terrorism, herders-farmers' crisis (causing damaged livestock, crops and infrastructure), market access, modern farm inputs (FAO, 2018), government neglect and policy somersault (Mou, 2014; Verter, 2016; MBNP, 2017). Also, agricultural value chains remain a dilemma partially occasioned by poor coordination, underdeveloped marketing and transport networks, and erratic electricity supplies. These challenges have partially nullified Nigeria and some ECOWAS member countries' capacity to achieve food self-sufficiency (Staatz and Hollinger, 2016; Torres and van Seters, 2016; FSIN, 2018; FAO, 2018) and comparative advantage (UNCTAD, 2019).

After Nigeria shifted from agricultural sector to crude oil and gas production and exports in the late 1960s (Verter, 2016; MBNP, 2017), for the past four decades, oil has accounted for an average of over more than 95% of foreign exchange earnings while agri-food exports earnings have been drastically stagnant accounted an average of 5% for period between 1995 and 2017 (ITC, 2019). Consequently, Nigeria has been a net importer of agri-food since 1975 (World Bank, 2019; UNCTAD, 2019). As postulated by dependency theories, Nigeria has heavily relied on the ECOWAS and other emerging economies for processed food products, notably wheat (Verter, 2016). Previous economic policies left Nigeria ill-prepared for the current crude oil shocks. The structure of the country's economy has primarily remained food import-dependent, driven by consumption and undiversified (MBNP, 2017).

To diversify Nigeria's economy and drastically curtail its vulnerability from the global shocks, the country launched a sound economic policy document, named 'Economic Recovery and Growth Plan (ERGP)' in 2017. Similarly, agrarian production and exports are prominently mentioned in the policy document. Specifically, the ERGP focuses on the country's self-sufficiency in major food import products, such as tomato paste, rice and wheat by 2019/2020. Thus, Nigeria plans to deepen investments in the agricultural value chain to become a net exporter of essential food products, such as rice, groundnuts, cashew nuts, cassava and

1 ECOWAS is made up of fifteen (15) member countries: Benin, Burkina-Faso, Cape Verde, Ivory Coast, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo.

vegetable oil by 2020 has been intensified since the launched of the policy document (MBNP, 2017).

It is vital to reiterate that the ERGP is based on Nigerian’s recent agrarian policies, such as the ‘Agricultural Transformation Agenda (ATA)’, which was in place for the period 2011–2015; and the ‘Agriculture Promotion Policy (APP)’, launched in 2015, and expected to run for the period 2016–2020 (FMARD, 2016). Both ATA and APA policies were launched to stimulate agricultural production and exports. Specifically, the policies have been targeted in creating millions of jobs; improving foreign earnings, and drastically reducing overdependence on food imports (FMARD, 2016). Also, the policies further aimed at attracting PPP in agriculture, minimising post-harvest losses, stimulating domestic value-added, enhancing farmers’ access to markets, finance and other inputs, and ensuring self-sufficiency in critical food products (MBNP, 2017). This study partially looks at the progress made and challenges of these policies in Nigeria from the food trade point of view.

In recent years, some scholars have used an analytical tool, called ‘products mapping’ to assess comparative (dis)advantage, trade performance and competitiveness in food products (Nwachukwu *et al.*, 2010; Ishchukova and Smutka, 2013; Jambor and Babu, 2016; Etuk and Ohen, 2017).

Nwachukwu *et al.* (2010) applied RCA, and Revealed Symmetric Comparative Advantage (RSCA) approaches to assess the competitiveness of Nigeria in cocoa products. The findings reveal that Nigeria was highly competitive in the export of cocoa products, especially between 1990 and 1995. They argue that the country experienced increases in competitive advantage mainly due to its tried to implement some export policies, such as the Structural Adjustment Programme (SAP), which was forced on Nigeria by the World Bank and IMF in the 1980s.

Ishchukova and Smutka (2013) use “products mapping” tool based on “revealed” comparative advantage (RCA) and trade balance index to analyse trade specialisation and performance in Russian agrarian sector for the period 1998–2010. The findings reveal products in group A have a comparative advantage and positive trade balance (5% of the exported products, about 50% of total agricultural exports). On the contrary (group B), all products have a comparative disadvantage and negative trade balance (80% of products accounted for about 30% of total exports but between 95 and 99% of the total imports).

Jambor and Babu (2016) investigate the competitiveness of different countries in global agriculture and food trade. Their findings reveal that Nigeria and other countries, such as Algeria, Cote d’Ivoire and Gabon have a comparative disadvantage in agricultural and food exports. Etuk and Ohen (2017) analyse trade performance and

competitiveness in palm oil product in Nigeria, Côte d’Ivoire and Ghana for the period between 1990 and 2013. Using RCA and RSCA approaches, the findings reveal that Côte d’Ivoire is highly competitive in palm oil exports, followed by Ghana and Nigeria. They argue that the RCA index in Nigeria has been low relative to Ghana and Côte d’Ivoire.

Even though a few studies have used RCA to assess trade performance and competitiveness in Nigeria, to the best of our knowledge, no study has used ‘products mapping’ tool hinged on Balassa index, Lafay index, and TBI to analyse trade in all food products between Nigeria and the ECOWAS. Thus, this study attempts to bridge the gap, as it aimed at assessing trade competitiveness between Nigeria and ECOWAS as well as Nigeria and the world in all 46 food products (as defined by the UN).

## MATERIALS AND METHODS

The statistical data for this is obtained from the databases of the United Nations Conference on Trade and Development (UNCTAD). The UNCTAD based on the UN Standard International Trade Classification (SITC) of data, supplied at the three-digit level (Rev. 3) for 46 agri-food product groups is used. This is in line with the definition of all food items (SITC 0+1+22+4) used by the World Trade Organization (WTO) as presented in Tab. I. The valuables are calculated at current prices (US\$).

An analytical tool called “products mapping” is used in this paper following Widodo (2008). Similarly, domestic trade-balance and global competitiveness are used to assess trade balance and comparative (dis)advantage in countries or regions (Widodo, 2008). The matrix for the distribution of the traded products are divided into four groups based on the two chosen valuables is presented in Tab. II. Recently, ‘products mapping’ approach has been used by Widodo (2008); Ishchukova and Smutka (2013) to analyse comparative (dis) advantage in agrarian trade.

To capture the degree of trade specialisation of a country, it is essential to assess the revealed comparative advantages of the relevant sectors included in the total agrarian trade. To achieve this Balassa (1965, 1977) suggested the following index of revealed comparative advantage (RCA). The RCA index is mathematically presented as follows:

$$BI_{ij} = \frac{\frac{X_{ij}}{X_i}}{\frac{X_{wj}}{X_w}}, \quad (1)$$

where:  $X$  indicates exports,  $i$  represents a nation,  $j$  signifies a product and  $w$  represents a set of countries.

The Balassa index varies between 0 and infinity. Values less than 1 signify that the economy does not have a comparative advantage. Also implies that

## I: Sectors and their numeric designations (SITC revision 3, 3-digit code (SITC))

SITC code	Product name	SITC code	Product name
001	Live animals	057	Fruit, nuts excl. oil nuts
011	Bovine Meat	058	Fruit, preserved, prepared
012	Other meat, other offal	059	Fruit, vegetable juices
016	Meat, ed. offl., dry, slt, smk	061	Sugars, molasses, honey
017	Meat, offl. Prdd, nes	062	Sugar, confectionery
022	Milk and cream	071	Coffee, coffee substitutes
023	Butter, other fat of milk	072	Cocoa
024	Cheese and curd	073	Chocolate, oth. cocoa prep.
025	Eggs, birds, yolks, albumin	074	Tea and mate
034	Fish, fresh, chilled, frozn	075	Spices
035	Fish, dried, salted, smoked	081	Animal feed stuff
036	Crustaceans, Molluscs	091	Margarine and shorten
037	Fish etc. prepd, prsvd. nes	098	Edible prod. prepetns, nes
041	Wheat, Meslin, Unmilled	111	Non-alcohol. beverage
042	Rice	112	Alcoholic Beverages
043	Barley, unmilled	121	Tobacco, unmanufactured
044	Maize unmilled	122	Tobacco, manufactured
045	Other cereals, unmilled	222	Oil seeds and oleaginous fruits (excl. flour)
046	Meal, Flour of wheat, msln	223	Oil seeds, oleaginous fruits (incl. flour, n.e.s.)
047	Other cereal meal, flours	411	Animal oils and fats
048	Cereal preparations	421	Fixed veg. fat, oils, soft
054	Vegetables	422	Fixed veg. fat, oils, other
056	Vegetables, prpd, prsvd, nes	431	Animal, veg. Fats, oils, nes.

Source: UNCTAD

## II: Product mapping scheme

	<b>Group B</b> Comparative Advantage No Export-Specialization (net – importer) (LFI > 0) and (TBI < 0)	<b>Group A</b> Comparative Advantage Have Export-Specialization (net – exporter) (LFI > 0) and (TBI > 0)
LFI > 0		
LFI < 0	<b>Group D</b> Comparative Disadvantage No Export-Specialization (net – importer) (LFI < 0) and (TBI < 0)	<b>Group C</b> Comparative Disadvantage Have Export-Specialization (net – exporter) (LFI < 0) and (TBI > 0)
	TBI < 0	TBI > 0
	Trade Balance Index (TBI)	

Source: Widodo, 2008

the economy does not specialised in exporting that given product; while values that exceed 1 signifies that the country has a comparative advantage in that given sector.

The theoretical foundation and empirical distribution characteristics of the Balassa Index have long been debated and criticised in the literature (Bowen, 1983; Vollrath, 1991; Hinloopen and Van Marrewijk, 2001; De Benedictis and Tambari, 2004;

Sanidas and Shin, 2010; Gnidchenko and Salnikov, 2015). Because of the shortcomings of the Balassa Index, it is also necessary to apply another index to see if there is a glaring difference. For this reason, the Lafay index (Lafay, 1992; Zaghini, 2003) is selected. The Lafay index (LFI), in contrast to Balassa, uses both export and import values. The LFI, by taking imports into account, allows controlling for intra-industry trade and re-exporting



flows; thus it is superior to the traditional BI index. The Lafay index values and the values of the net trade highly correlate (Gnidchenko and Salnikov, 2015). That is important, as net trade is considered the right indicator of comparative advantages in some theoretical frameworks and empirical studies (Leamer, 1984; de Ferranti *et al.*, 2002). Another advantage of the Lafay index is its reliability when comparing its values in time series. The Lafay index (Zaghini, 2005) is defined for a given nation and product as follows:

$$LFI_j^i = 100 \left( \frac{x_j^i - m_j^i}{x_j^i + m_j^i} - \frac{\sum_{i=1}^N (x_j^i - m_j^i)}{\sum_{i=1}^N (x_j^i + m_j^i)} \right) \frac{x_j^i + m_j^i}{\sum_{i=j}^N (x_j^i + m_j^i)}, \quad (2)$$

where:  $x$  and  $m$  are the export and import values of individual product group of agrarian trade between Nigeria and ECOWAS countries. Zero represents a neutral value regarding reporting a comparative advantage. A positive value for the Lafay index indicates the existence of comparative advantage for a specific sector and a negative value of the Lafay index suggests the presence of a comparative disadvantage for a particular industry. This means that a higher index value indicates a higher degree of comparative advantage and specialisation. The values of Lafay index were calculated for 46 different product groups constituting agrarian foreign trade of Nigeria with the different regions.

The trade balance index (TBI) is employed to analyse whether a nation has specialisation in export (as net-exporter) or import (as net-importer) for a specific group of products. TBI is mathematically formulated as follows:

$$TBI_j^i = \frac{x_j^i - m_j^i}{x_j^i + m_j^i} \times 100, \quad (3)$$

where:  $TBI_j^i$  denotes trade balance index of country  $i$  for product  $j$ ;  $x_j^i$  and  $m_j^i$  represent exports and imports of product products  $j$  by nation  $i$ , respectively. The values of the index range from -100 to +100. Exceptionally, the TBI equals -100 if a nation only imports. On the other hand, the TBI equals +100 if a nation only exports. Undoubtedly, the index is not defined when a nation neither exports nor imports. Similarly, Nigeria is known as a "net-exporter" of a product if the value of TBI is positive. On the contrary, Nigeria is referred to as "net-importer" or consumer of particular product group if the value of TBI is negative.

Accordingly, the Lafay index and TBI can be combined to create an analytical tool, called product mapping, which classifies a product and a country into four categories as follows: Group A – Nigeria has a comparative advantage and is a net-exporter; Group B – Nigeria has a comparative advantage but is net-importer; Group C – Nigeria has a comparative disadvantage but is a net-exporter; Group D – Nigeria has a comparative disadvantage and is net-importer.

## RESULTS AND DISCUSSION

### Nigeria Trade in Agri-Food Products

The value of agricultural exports in Nigeria rose by 115.1% in the Q4 of 2018 compared to Q3 of 2018, and 118.5% compared to Q4 2017. The major exported products were cocoa products, sesame seeds (whether or not broken) and cashew nuts (in shell). On the other hand, imported agricultural products declined by -2.23% less than in Q3 of 2018, and -3.9% between 2017 and 2018. The major imported products were wheat (imported mainly from Russia, Canada and the USA), crude palm oil (from Malaysia, Columbia, and the USA) (NBS, 2019).

The direction of these transactions indicates that sesame seeds were exported mostly to China and Japan, cocoa products were mainly exported to the Netherlands and Germany, while cashew nuts (in shell) were exported primarily to Vietnam and India (ITC, 2019a; NBS, 2019). This shows that the country's agricultural exports have improved while imports have declined.

Although the value of food exports in the country fluctuated, it increased from \$378 million in 1995 to its peak in 2010 with \$1.86 billion, before declining to \$1.15 billion in 2016, and then slightly increased to \$1.45 billion in 2017. Sadly, Nigeria substantially recorded negative trade balance in total agri-food products throughout the period under study (Tab. III) although the country is regarded as an agrarian nation.

The findings of food trade in Nigeria, based on Balassa, Lafay and TBI approaches, in 46 agri-food product products (No. of sectors) are presented in this section of the paper. Also, as presented in Tab. III, the TBI rather than improve, it declined from -42.4% to -62.8% between 1995 and 2017. This indicates that the country's competitiveness in agri-food products has reduced while overdependence of food imports has been drastically increased over the years.

As shown in Tab. III, the Balassa index indicates that, on average, it reveals that Nigeria has a comparative advantage in 7 out of 46 (7/46) agri-food product groups. On the other hand, the country had a comparative disadvantage in 39/46 products. In the same direction, Lafay's index reveals that the number of agri-food product groups with comparative advantage declined from 18 in 1995 to 12/46 in 2017.

On the other hand, the products with comparative disadvantage increased from 27/46 to 34/46, implying that the country's performance in some product groups has been sluggish. Also, Jambor and Babu (2016) confirm that Nigeria has a comparative disadvantage in agricultural and food exports.

Also, Tab. III presents the results of 'product mapping' which is classified into product groups A–D. Products in Group A (has a comparative advantage and is a net-exporter) indicates that

## III: Changes in agri-food trade (SITC 0+1+22+4), Balassa and Lafay indices in Nigeria

Nigeria ↔ World (SITC 0+1+22+4)		1995	2000	2005	2010	2015	2016	2017	Δ17–95
No. of sectors	No.	46	46	46	46	46	46	46	-
Export	Mill. US\$	378	185	750	1,862	1,794	1,147	1,445	1,067
Import	Mill. US\$	934	1,455	3,749	5,575	6,639	4,391	6,120	5,186
Balance	Mill. US\$	-556	-1,270	-3,000	-3,713	-4,846	-3,244	-4,675	-4,119
TBI	Index	-42.4	-64.2	-66.7	-49.9	-57.5	-58.6	-61.8	19.4
Balassa index	CA	7	6	6	6	7	7	8	1
	disCA	39	40	40	40	39	39	38	-1
Lafay index	CA	18	10	14	11	12	8	12	-6
	disCA	27	36	32	35	34	38	34	7

## Lafay Index

A	No. of sectors	No.	12	7	9	8	7	7	8	-4
	Export	Mill. US\$	340	169	709	1,696	1,465	1,035	1,225	884
	Share on export	%	90.0	91.4	94.6	91.1	81.7	90.3	84.8	-5.3
	Import	Mill. US\$	14	14	53	71	196	108	172	158
	Share on import	%	1.5	1.0	1.4	1.3	3.0	2.5	2.8	1.3
	Balance	Mill. US\$	327	155	656	1,625	1,269	927	1,053	726
B	No. of sectors	No.	6	4	5	3	5	1	4	-2
	Export	Mill. US\$	8	4	12	83	165	27	78	69
	Share on export	%	2.2	2.3	1.6	4.4	9.2	2.4	5.4	3.1
	Import	Mill. US\$	13	10	48	153	443	66	168	155
	Share on import	%	1.4	0.7	1.3	2.7	6.7	1.5	2.8	1.4
	Balance	Mill. US\$	-4	-6	-36	-70	-278	-39	-91	-86
D	No. of sectors	No.	27	35	32	35	34	38	34	7
	Export	Mill. US\$	29	12	29	84	163	85	142	113
	Share on export	%	7.7	6.3	3.8	4.5	9.1	7.4	9.8	2.1
	Import	Mill. US\$	907	1,431	3,648	5,350	6,000	4,216	5,779	4,872
	Share on import	%	97.1	98.3	97.3	96.0	90.4	96.0	94.4	2.7
	Balance	Mill. US\$	-878	-1,419	-3,620	-5,267	-5,837	-4,132	-5,637	-4,759

Source: Authors' analysis based on UNCTAD. Note: CA= comparative advantage; disCA= comparative disadvantage; No. Sectors denote the total number of products in the group. A, B, D = products mapping groups

Nigeria's comparative advantage rather than increase, it decreased from 12/46 in 1995 to 7/46 in 2016, before increasing to 8/46 product groups in 2017. These product groups accounted for over 85% and 2.5% share of the total agri-food export and import respectively in Nigeria. This indicates that Nigeria has concentrated/specialised in exporting only few food product groups. Similarly, the country substantially recorded a positive trade balance (and TBI) in these product groups

(Appendix 1)<sup>2</sup>. This result is in line with the findings by Nwachuku *et al.* (2010), and Etuk and Ohen (2017) as their studies also revealed that Nigeria has a comparative advantage in cocoa (SITC 072) and oil palm products.

This slight structural shift is in line with overall tendencies in agri-food trade of African countries. The economic globalisation in commodity chains contributed to the rapid growth of agri-food exports and structural changes in the composition

2 Appendix 1 shows 4 food items in Nigeria with constant comparative advantage and positive trade balance (between 1995–2017): crustaceans, mollusks and aquatic invertebrates (SITC 036); fruits and nuts (SITC 057); cocoa (SITC 072); and oil seeds and oleaginous fruits, excluding flour (SITC 222). Also, Nigeria recorded constant comparative advantage with spices (SITC 075); and SITC122 (tobacco, manufactured) from 2013 to 2017.

of agri-food trade (Henson *et al.* 2000; Maertens and Swinnen, 2009) and many African countries moved the composition of agri-food exports from traditional (coffee, tea, sugar, cocoa) to non-traditional and high value (fruit and vegetables, poultry, fish) commodities (Santeramo and Lamonaca, 2019).

Products in Group B (has a comparative advantage but a net-importer) shows that the number of products and its share on total exports fluctuated over time. The number of sectors decreased from 6/46 in 1995 to 1/46 in 2016, before increasing to 4/46 in 2017 (Tab. III). Some of these products moved from group B to group D. This indicates that the products performed poorly in the global markets.

The products in Group D (has a comparative disadvantage and is net-importer) shows that Nigeria’s comparative disadvantage rather than decrease, it increased from 27/46 in 1995 to 38/46 in 2016, before rising to 34/46 product groups in 2017<sup>3</sup>. These product groups accounted for over 90% and 9% of the total agri-food import and export, respectively, in Nigeria (Tab. III). It is important to pinpoint that the revealed comparative disadvantage of some sectors fluctuated and moved to either direction over time, whereas some products remain relatively stable within the same period. These results are narrowly in contrast to the findings by Ishchukova and Smutka (2013), that show “products mapping” in group A and D with 51% and 98% of total food export respectively in Russia in 2010.

Arguably, the reduction of the number of product groups with comparative disadvantage reduced in 2016 can be attributed to the country’s importation ban in some selected food commodities<sup>4</sup>. Also, government efforts to stimulate production and processing of some food products, such as cassava, rice and tomatoes and substitute with some import products (i.e. cassava flour as a substitute for wheat in bread) may have started yielding results (FAO, 2018).

### Trade in Food Products between Nigeria and ECOWAS

The findings of the structural changes, comparative (dis)advantage and specialisation of trade in all food products between Nigeria and the ECOWAS is presented in Tab. IV. All food items exported from Nigeria to the ECOWAS member countries fluctuated but also grew from \$14 million in 1995 to its peak in 2015 with \$164 million, before

declining to \$106 million in 2016, and then slightly increased to \$205 million in 2017. Sadly, Nigeria substantially recorded a negative trade balance with the ECOWAS in food products throughout the period under study, from -\$25 million in 1995 to -\$76 million in 2017. Similarly, the country’s TBI also substantially shows negative outcomes. The TBI drastically declined from -46.8% in 1995 to -91.3% in 2000, before rising to -11.5% in 2016, and then declined to -15.6% in 2017.

Most food value chains in West Africa suffer from the problems of poor quality and low quantity output, attributed with high costs of production, and limited incentives. Thus, these factors coupled with other NTBs and TBTs directly or indirectly impede intra-ECOWAS trade in food and other products (Hollinger and Staatz, 2015; Staatz and Hollinger, 2018). Despite these challenges, market opportunities for Nigeria’s food exporters to ECOWAS are increasingly dynamic occasioned by income and population growth, urbanisation, dietary diversification and higher output prices (Hollinger and Staatz, 2015; Staatz and Hollinger, 2016).

The share of intra-ECOWAS trade in total food items rose from 6.2% (exports) and 7.4% (imports) in 1995 to 13.4% (exports) and 11.2% (imports) in 2017 (UNCTAD, 2019). Similarly, the share of agri-food exports (% of total food exports) from Nigeria to the ECOWAS countries increases from 3.8% in 1995 to 14.2% in 2017. The exports share was slightly above intra-ECOWAS average, but below expectations.

Similarly, Nigeria’s imports from the ECOWAS fluctuated but minimally increased by from 4.2% in 1995 to 6.4% in 2017 (Tab. IV), and below the intra-ECOWAS average. Arguably, Nigeria’s export share to ECOWAS has grown partly because of the efforts and policies made by the community and Nigeria to stimulate domestic food production and intra-ECOWAS trade. For instance, Staatz and Hollinger (2018); UNCTAD (2018) maintain that the elimination of tariffs and NTBs, as well as regulatory cooperation, have boosted food trade in the region. Nevertheless, Nigeria’s imports from the community has not been dramatically improved as the country demands for value-added products which hardly produce and trade in large quantities within ECOWAS member countries (Verter, 2017).

Also, Tab. IV presents the results of ‘product mapping’, which has been grouped from A–D, based

3 Appendix 1 shows 14 food items in Nigeria with constant comparative disadvantage and negative trade balance (between 1995–2017): SITC 023 (butter, other fat of milk); SITC 024 (cheese and curd); SITC 034 (fish, fresh, chilled, frozen); SITC 035 (fish, dried, salted, smoked); SITC 037 (fish etc. prepd, prsvd. Nes); SITC 041 (wheat, meslin, unmilled); SITC 042 (rice); SITC 059 (fruit, vegetable juices); SITC 061 (sugars, molasses, honey); SITC 074 (tea and mate); SITC 091 (margarine and shorten); SITC 098 (edible prod. prepetns, nes); SITC 411 (animal oils and fats); SITC 431 (animal, veg. Fats, oils, nes.)

4 Nigeria prohibited and restricted from food imports to the country: all bovine animal meat and edible offal (fresh, chilled, frozen), sheep, pork, goats and edible offal of horses, mules and asses (UNCTAD, 2018).

## IV: Changes in the structure of food trade (SITC 0+1+22+4) between Nigeria and ECOWAS

Nigeria ↔ ECOWAS		1995	2000	2005	2010	2015	2016	2017	Δ17–95	
Export	Mill. US\$	14	3	16	89	164	106	205	190	
Import	Mill. US\$	40	68	84	351	375	133	280	241	
Balance	Mill. US\$	-25	-65	-68	-262	-211	-28	-76	-50	
TBI	Index	-46.8	-91.3	-67.7	-59.6	-39.1	-11.5	-15.6	-31	
<b>NIG-ECOWAS agri-food trade (% of total agri-food trade)</b>										
Exports	%	3.8	1.7	2.2	4.8	9.1	9.2	14.2	10.4	
Imports	%	4.2	4.7	2.2	6.3	5.6	3.0	4.6	0.3	
<b>Results of product mapping (LFI index)</b>										
A	No. of sectors	No.	19	13	19	15	24	26	7	
	Export	Mill. US\$	8	1	13	82	155	103	202	194
	Share on export	%	58.0	31.7	79.7	92.1	94.7	97.4	98.7	40.7
	Import	Mill. US\$	0	0	2	5	57	19	51	51
	Share on import	%	0.7	0.4	2.5	1.5	15.2	14.4	18.2	17.5
	Balance	Mill. US\$	8	1	11	77	98	84	151	143
B	No. of sectors	No.	4	9	9	6	4	3	1	-3
	Exports	Mill. US\$	2	1	2	4	3	1	0	-2
	share on export	%	14.7	40.4	13.5	4.5	2.0	1.3	0.1	-14.6
	Imports	Mill. US\$	3	3	5	6	7	2	0	-2
	share on import	%	7.2	4.4	6.5	1.8	1.7	1.6	0.2	-7.1
	balance	Mill. US\$	-1	-2	-3	-2	-3	-1	0	1
D	No. of sectors	No.	18	23	17	23	18	18	17	-1
	Export	Mill. US\$	4	1	1	3	5	1	2	-2
	share on export	%	27.3	27.9	6.8	3.4	3.3	1.3	1.2	-26.1
	Imports	Mill. US\$	37	65	76	340	312	112	229	192
	Share on imports	%	92.1	95.1	91.0	96.8	83.1	84.0	81.7	-10.4
	Balance	Mill. US\$	-33	-64	-75	-337	-306	-110	-227	-194

Source: Authors' analysis based on UNCTAD

on Lafay index. Products in Group A indicates that agri-food products (No. of sectors) exported from Nigeria to the ECOWAS with comparative advantage increased by 7/46 products, rising from 19/46 in 1995 to 26/46 products in 2017. Similarly, the share of these products in the total exports and imports also increased from 58% and 0.7% to 98.7% and 18% between 1995 and 2017 respectively. This translated to an average increase of exports of about 41% within the same period. The products included in group A have a comparative advantage and significant positive trade balance, notably, tobacco (SITC 122); edible products (SITC 098); non-alcoholic beverages (SITC 111). For instance, SITC 122 and

SITC 098 jointly accounted for over 60% of total food exports to ECOWAS between 2015 and 2017. This implies that Nigeria has concentrated/specialised in exporting only few food product groups to the ECOWAS's markets.

Also, products mapping in Group A further indicates that Nigeria substantially has more comparative advantages in trading with ECOWAS that with the world between 1995 and 2017 (Tab. III, Tab. IV, Appendix 1), albeit with low dollar values. Nevertheless, with the trade performance (ITC, 2019a) and zero tariffs (import duties) within the ECOWAS<sup>5</sup> in recent years (ITC, 2019b), Nigeria has the potential to increase its trading capacity

5 Although there is market access for Nigerian agri-food products within the ECOWAS member countries, nonECOWAS countries charge from low to high import duties. For instance, import duties applied (AVE based on the World Tariff Profile (WTP)) on Nigeria product SITC 24 (tobacco and manufactured tobacco substitutes) in the EU member countries 18.79% (in 2018), India 32.26% (in 2018), Angola 60% (in 2018), Thailand 64.77% (in 2015), South Africa 98.87% (in 2019), Botswana 102.90% (in 2019), and Malaysia 135.61% (in 2014) in recent years (ITC, 2019b).



and record more products with a comparative advantage in the long run.

Products in Group B (has a comparative advantage but a net-importer) shows that the number of products, dollar values and its share on total exports fluctuated over time, and reduced from 4/46 in 1995 to 1/46 in 2017. Similarly, 3 (SITC 034, SITC 056 and SITC 057) out of 4/46 products found in this group in 1995 moved to Group D in 2017.

Products in Group D shows that Nigeria's comparative disadvantage in the food products rather than decrease, it increased from 18/46 in 1995 to 13/46 in 2010, before decreasing to 17 in 2017. Also, the share of these product groups in the total agri-food imports from the ECOWAS increased from 92% in 1995 to about 97% in 2010, before declining to 82% in 2017. On the other hand, the share of these product groups in the total food export products merely decreased from 4% in 1995 to 2% in 2017. Furthermore, Nigeria has been a net-importer in the product groups. This to some extent, contrasts with studies by Ishchukova and Smutka (2014) whose results reveal that the majority of food export products in Russia fall in group D category (products with comparative disadvantages). This implies that Nigeria has more products with a comparative advantage in trade with ECOWAS than Russia with the world (Tab. III). Notwithstanding, agri-food trade between Nigeria and the world indicates similar tendencies as in Russia and the world (Tab. IV).

Interestingly, some of the food products which Nigeria has been a net importer and has had a comparative disadvantage in the global markets, on the other hand, the country has been a net exporter and has had a comparative advantage when trade with ECOWAS (Appendix 2). Those products include SITC 111; SITC 062 (sugar confectionery),

cereals (SITC 045; SITC 047; SITC 048); and SITC 023 (butter and other fats and oil derived from milk). Importantly, after many years of adverse TBI (from 2007–2016), the country witnessed positive TBI with ECOWAS in rice (SITC 042) commodity in 2017. This may be connected with recent government efforts to increase its production and reduce over-reliance on imports.

By and large, partly because Nigeria and other ECOWAS countries highly trade with primary food products with low demand and price within the region. Some of these products, especially tropical commodities, are highly demanded in other continents, but in primary forms, as postulated by dependency and traditional trade theories (Verter, 2017). The products, such as cocoa and oilseeds are largely exported to other regions other than west Africa. Therefore, the total values of food trade between Nigeria and ECOWAS have been low (Tab. IV). Nevertheless, this study has shown that Nigeria has had more comparative advantages in many food products in trading with the ECOWAS than with the world (Appendix 1). The structure of Nigeria's food trade with ECOWAS has started involving and improving, albeit at a slow pace.

The results are in line with general observation, that product composition of regional trade can be quite different from that of global trade (Krugman, 1980; WTO, 2011). The identification of specific reasons is out of the scope of this article, but generally the (dis)similarity in taste, the level of the regional economy (Linden, 1961), the high complexity of certain markets (like EU) or currently applied trade policy measures (the tariff or non-tariff) barriers may explain food trade patterns between Nigeria and ECOWAS as well as the global market.

## CONCLUSION

The agri-food trade from developing countries (and this was just typical of countries in Africa) has progressively expanded since the mid-1990s, but suffered a setback since 2014 (Martin, 2018). Nigeria's agri-food trade underwent a similar dynamic. Although Nigeria is regarded as an agrarian nation, it substantially recorded negative trade balance in total agri-food products throughout the period under study.

The paper uses an analytical tool, called 'products mapping' to assess trade competitiveness between Nigeria and ECOWAS as well as Nigeria and the world in all 46 food products for the period 1995–2017. The 'products mapping' divided all the food items (46 products) into four groups (Group A-D). For Nigeria and the world, Group A (leading agri-food products) reveals that the country's comparative advantages in the food products declined from 12/46 (90% of total exports) in 1995 to 8/46 (or 85% of total exports) in 2017. This indicates rather a specialisation than diversification towards new products. Nevertheless, the products in group A have significant positive TBI, notably, cocoa (SITC 072), crustaceans (SITC 036), fruits and nuts (SITC 057); and oil seeds and oleaginous fruits (SITC 222). In particular, these products mostly and positively contribute to Nigeria's trade balance in agri-food products.

Besides the change in the number of leading products (Group A), the results indicate a structural shift among the leading products. The food export of Nigeria used to be substantially mono-product, but the share of cocoa export in the total agri-food export declined from over 60% to 35% between 1995 and 2017. Contrary, the share of fruits and nuts increased from 7% to 16%.

This slight structural shift is in line with overall tendencies in food trade of Sub-Saharan African (SSA) countries. The economic globalisation in commodity chains contributed to the structural changes in the composition of food trade as many SSA countries moved the composition of agri-food exports from traditional to non-traditional and high-value commodities.

On the other hand, dropping agri-food products with comparative disadvantage and negative TBI (Group D), rose from 27/46 or accounted for 97.1% of total food imports in 1995 to 34/46 or accounted for 94.4% of total food imports in 2017. Notably, it is wheat (041), fish (034), edible products and preparations (098), sugar (061) and milk and cream (022). In particular, these products mostly and negatively contribute to Nigeria's trade balance in agri-food products.

Contrary to Nigeria's trade with the world, the country's trade with ECOWAS revealed that its comparative advantages (in Group A) rose from 19/46 (58% of total food exports) in 1995 to 26/46 (or 97.8% of total food exports) in 2017. The products in group A have tremendous positive trade balance (and TBI), notably, tobacco, edible products, maize and wheat.

Despite the slide increase in the share of Nigeria's trade with ECOWAS countries, the country remains highly focused on non-ECOWAS markets. On the other hand, the product mapping revealed some of the promising product groups for expansion within the region and potential for Nigeria to diversify its agri-food export structure.

Inversely, food products with comparative disadvantage and adverse trade balance (Group D), slightly reduced from 18/46 or accounted for 92.1% of total food imports in 1995 to 17/46 or accounted for 81.7% of total food imports in 2017.

Also, products mapping in Group A further indicates that Nigeria substantially has more comparative advantages in trading with ECOWAS than with the world between 1995 and 2017, albeit with low dollar values. The findings further suggest that the structure of Nigeria's food trade with ECOWAS has started involving and improving, albeit at a slow pace. As ECOWAS has started opening its markets for regional trade, Nigeria has the potential to diversify and increase its trading capacity for more comparative advantages in the long run.

For Nigeria and other ECOWAS member countries' trade in food products within the community and elsewhere in the world to improve, there is an urgent need to boost domestic production and food processing industries for value-added. Also, the Nigerian government should dramatically implement its agricultural policies for food self-sufficiency and foreign earnings in many products.

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#### REFERENCES

- BALASSA, B. 1965. Trade liberalisation and "revealed" comparative advantage. *The Manchester School*, 33(2): 99–123.
- BALASSA, B. 1977. Revealed' comparative advantage revisited: an analysis of relative export shares of the industrial countries, 1953–1971. *The Manchester School*, 45(4): 327–344.
- BLIZKOVSKY, P., GREGA, L. and VERTER, N. 2018. Towards a common agricultural policy in Africa? *Agricultural Economics*, 64(7): 301–315.
- BOWEN, H. 1983. On the Theoretical Interpretation of Indices of Trade Intensity and Revealed Comparative Advantage. *Weltwirtschaftliches Archiv*, 119(3): 464–472.
- DE BENEDICTIS, L. and TAMBERI, M. 2004. Overall Specialization Empirics: Techniques and Applications. *Open Economies Review*, 15(4): 323–346.
- DE FERRANTI, D., PERRY, G., LEDERMAN, D. et al. 2002. *From Natural Resources to Knowledge Economy: Trade and Job Quality*. [Online]. Washington, DC: World Bank. Available at: <https://1url.cz/dMSqM> [Accessed: 2019, August 19].
- ECONOMIST INTELLIGENCE UNIT. 2018. Global food security index 2018: Building resilience in the face of rising food-security risks. *Global food Security Index*. [Online]. Available at: <https://bit.ly/2sgHSq1> [Accessed: 2019, January 22].
- ETUK, E. A. and OHEN, S. B. 2017. Revealed comparative advantage and competitiveness: the case of palm oil exports from Nigeria, Ghana and Côte d'Ivoire. *Journal of Agriculture and Veterinary Science*, 10(7): 36–40.
- FAO. 2018. *Food outlook- biannual report on global food markets – November 2018*. Rome: FAO.

- FEDERAL MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT. 2016. *The agriculture promotion policy (2016–2020): building on the successes of the ATA, closing key gaps*. Policy and Strategy Document. Abuja: FMARD
- FOOD SECURITY INFORMATION NETWORK. 2018. Global report on food crises 2018. *World food Programme*. Available at: <https://bit.ly/2CNbBhA> [Accessed 2019, January 20].
- FOROUTAN, F. and PRITCHETT, L. 1993. Intra-Sub-Saharan African trade: is it too little? *Journal of African Economies*, 2(1): 74–105.
- GNIDCHENKO, A. and SALNIKOV, V. 2015. *Net Comparative Advantage Index: Overcoming the Drawbacks of the Existing Indices*. [Online]. Higher School of Economics Research Paper No. WP BRP 119/EC/2015. Available at: <https://ssrn.com/abstract=2709009> [Accessed: 2019, August 19].
- HOLLINGER, F. and STAATZ, J. M. 2015. *Agricultural growth in West Africa: Market and policy drivers*. Rome: FAO and AfDB.
- HINLOOPEN, J. and VAN MARREWIJK, C. 2001. On the Empirical Distribution of the Balassa Index. *Weltwirtschaftliches Archiv*, 137(1): 1–35.
- ISHCHUKOVA, N. and SMUTKA, L. 2013. Comparative advantage: products mapping of the Russian agricultural exports. *AGRIS on-line Papers in Economics and Informatics*, 5(3): 13–24.
- ISHCHUKOVA, N. and SMUTKA, L. 2014. “Revealed” comparative advantage: products mapping of the Russian agricultural exports in relation to individual regions. *Acta Scientiarum Polonorum. Oeconomia*, 13(1): 45–61.
- ITC. 2019a. List of supplying markets for the product imported by Czech Republic in 2018. *Trade Map – Statistical database*. [Online]. Available at: <http://bit.ly/1EowRPT> [Accessed 2019, January 20].
- ITC. 2019b. *Market access map: improving transparency in international trade market access* [Online]. Available at: <https://bit.ly/2Mso7VP> [Accessed: 2019, January 23].
- JAMBOR, A. and BABU, S. 2016. The competitiveness of global agriculture. In: *Competitiveness of global agriculture*. Cham: Springer.
- KRUGMAN, P. 1980. Scale economies, product differentiation, and the pattern of trade. *American Economic Review*, 70(5): 950–959.
- LAFAY, G. 1992. *The measurement of revealed comparative advantages*. In: DAGENAIS, M. G. and MUET, P.-A. (Eds.). *International Trade Modelling*. London: Chapman & Hall.
- LEAMER, E. 1984. *Sources of International Comparative Advantage: Theory and Evidence*. Cambridge, MA: MIT Press.
- LINDER, S. B. 1961. *An Essay on Trade and Transformation*. New York: Wiley and Sons.
- MARTIN, W. 2018. A Research Agenda for International Agricultural Trade. *Applied Economic Perspectives and Policy*, 40(1): 155–173.
- MINISTRY OF BUDGET AND NATIONAL PLANNING. 2017. *Economic recovery & growth plan 2017–2020*. Abuja: MBNP.
- MOU, D. 2014. *State power, agrarian policies and peasant welfare: Politics of agricultural marketing and commodity boards in Nigeria*. London: Authorhouse.
- NATIONAL BUREAU OF STATISTICS. 2019. *Foreign trade in goods statistics (Q4 2018)*. Abuja: NBS.
- NWACHUKU, I. N., AGWU, N., NWARU, J. and IMONIKHE, G. 2010. Competitiveness and determinants of cocoa export from Nigeria. *Report and Opinion*, 2(7): 51–54.
- OKOLO, J. E. 1989. Obstacles to increased intra-ECOWAS trade. *International Journal*, 44(1): 171–214.
- SANIDAS, E. and SHIN, Y. 2010. *Comparison of revealed comparative advantage indices with application to trade tendencies of East Asian countries*. [Online]. Available at: [http://www.akes.or.kr/eng/papers\(2010\)/24.full.pdf](http://www.akes.or.kr/eng/papers(2010)/24.full.pdf) [Accessed: 2019, January 23].
- SANTERAMO, F. G. and LAMONACA, E. 2019. On the impact of non-tariff measures on trade performances of the African agri-food sector. *Agrekon*, DOI: 10.1080/03031853.2019.1568889.
- SHUAIBU, M. 2015. Trade liberalization and intra-regional trade: a case of selected ECOWAS countries. *African Development Review*, 27(1): 27–40.
- STAATZ, J. and HOLLINGER, F. 2016. *West African food systems and changing consumer Demands*. West African Papers, No. 04. Paris: OECD Publishing.
- TORRES, C. and VAN SETERS, J. 2016. *Overview of trade and barriers to trade in West Africa: Insights in political economy dynamics, with particular focus on agricultural and food trade*. Discussion Paper 195. Maastricht: European Centre for Development Policy Management.
- UNCTAD. 2018. *Regional integration and non-tariff measures in the Economic Community of West African States*. New York and Geneva: United Nations.
- UNCTAD STAT. 2019. *Unctad Stat Data Center*. World statistical database. [Online]. Available at: <https://bit.ly/21GbfKX> [Accessed: 2019, January 15].
- VERTER, N. 2016. Analysis of external influences on agricultural performance in Nigeria. *Acta Univ. Agric. Silv. Mendelianae Brun.*, 64(5): 1805–1821.

- VERTER, N. 2017. International trade: the position of Africa in global merchandise trade. In: *Emerging Issues in Economics and Development*. Intech Open, pp.64–89.
- VOLLRATH, T. 1991. A Theoretical Evaluation of Alternative Trade Intensity Measures of Revealed Comparative Advantage. *Weltwirtschaftliches Archiv*, 127(2): 265–280.
- WIDODO, T. 2008. “Products mapping” and dynamic shift in the patterns of comparative advantage: could India catch up China? *Journal of Chinese Economic and Foreign Trade Studies*, 1(3): 200–213.
- WORLD BANK. 2019. World development indicators. *Data Bank*. [Online]. Available at: <http://bit.ly/1Cd8EkQ> [Accessed: 10 March 2019].
- WTO. 2011. *World Trade Report: The WTO and preferential trade agreements: from co-existence to coherence*. Geneva: WTO.
- ZAGHINI, A. 2005. Evolution of trade patterns in the new EU member states. *Economics of Transition*, 13(4): 629–658.

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APPENDIXES

Appendix 1: Product mapping in agri-food trade (LFI) between Nigeria and World/ECOWAS, 1995–2017

SITC	Nigeria ↔ World					Nigeria ↔ ECOWAS				
	1995	2000	2005	2010	2017	1995	2000	2005	2010	2017
001										
011										
012										
016										
017										
022										
023										
024										
025										
034										
035										
036										
037										
041										
042										
043										
044										
045										
046										
047										
048										
054										
056										
057										
058										
059										
061										
062										
071										
072										
073										
074										
075										
081										
091										
098										
111										
112										
121										
122										
222										
223										
411										
421										
422										
431										

Source: Authors' analysis based on UNCTAD data. Note: Group A= green (Nigeria has a comparative advantage and is a net-exporter); Group B= blue (Nigeria has a comparative advantage but is net-importer); Group D= red (Nigeria has a comparative disadvantage and is net-importer); white colour= no data



Appendix 2: TBI in agri-food trade between Nigeria and ECOWAS, 1995, 2000, 2005–2017

SITC	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
001	-92	-100	-100	-100	-100	-100	-100	-100	-100	-100	-100	-99	-89	-98	90
011	-	-100	55	-100	-100	-100	-	-100	-	-100	-	-	-100	-	-
012	-	-100	-100	-70	-100	100	-100	-100	-	-	94	80	100	100	100
016	-100	-100	-100	-100	-100	-100	-100	-100	-51	60	-100	-100	37	-	-
017	-100	-100	-86	46	-	100	100	-100	-100	-99	100	93	94	-99	100
022	-82	-16	-40	-73	75	20	-24	49	84	94	99	96	94	84	52
023	-	100	11	95	-100	-	100	-100	-	100	100	100	100	100	100
024	100	-100	-11	-	100	100	100	-	-100	100	-	100	100	100	100
025	100	57	89	96	100	84	-85	-100	100	-26	100	100	29	100	100
034	-16	-82	-97	-99	91	-75	-86	-76	-82	-99	-91	-93	-97	-97	-96
035	-100	-100	-100	-100	-100	-100	-100	-100	-100	-100	-100	-99	-99	-97	-100
036	-100	-99	100	100	100	-100	-100	45	100	98	-98	100	100	100	100
037	-83	-95	-89	-98	-84	56	14	-76	8	16	90	100	85	100	-83
041	-95	100	88	-100	100	100	-100	-96	100	100	100	100	100	100	100
042	98	-98	90	43	-86	-100	-100	-100	-100	-100	-75	-86	-94	-69	100
043	-	-	-	-	-	-	-	-	-	-	-100	-100	-99	-	100
044	99	100	100	96	100	100	100	100	100	100	99	-18	42	100	100
045	97	92	96	100	100	100	100	100	100	100	37	98	84	98	100
046	-90	-72	69	79	97	82	94	90	100	-85	-84	-45	-96	-89	63
047	94	82	100	86	99	-79	100	100	-28	100	100	96	100	100	100
048	84	-62	95	24	99	61	67	29	68	83	49	24	75	20	94
054	-91	-99	-83	-76	-75	-96	-81	-79	-79	-71	-13	-65	-37	-18	-79
056	-42	38	67	-99	-84	-50	-8	8	85	78	91	53	28	-88	-95
057	-10	-12	22	10	-43	-21	15	-4	-81	-65	-93	-80	-92	-74	-99
058	100	-99	-98	100	-81	-100	-100	-99	-100	-99	-99	-99	-97	-100	-99
059	69	43	-47	-24	87	99	-62	40	56	-3	81	52	57	-24	22
061	100	30	35	51	83	54	93	28	92	92	100	94	97	-19	-69
062	98	-21	76	99	100	96	23	70	93	96	91	88	91	90	19
071	-100	-100	-98	-99	-100	-100	-100	-100	-100	-100	-100	-100	-100	-100	-100
072	-32	-100	-98	-49	93	98	-100	40	-21	-83	56	-51	-38	59	100
073	97	71	63	77	-16	-79	-3	-28	-60	-87	-91	-81	-83	-93	-99
074	14	-48	58	34	-61	51	3	-34	-90	29	97	100	96	100	-65
075	47	-85	-14	-28	-55	-30	-14	-22	78	-7	63	76	98	13	-31
081	-90	-97	51	-52	100	-91	17	95	97	40	-51	-78	-6	45	23
091	-100	-98	-98	-100	-100	-100	-100	-100	-97	-100	-96	-98	-98	-100	-100
098	-43	-92	-41	-76	-29	-23	18	-51	-4	21	64	53	16	63	71
111	64	-16	-40	-88	76	56	100	-43	12	93	94	71	76	100	100
112	75	-65	-70	0	100	-11	-31	-96	-87	-98	-63	-66	-89	-89	-80
121	100	100	76	-99	-100	-100	-98	89	100	100	100	100	100	100	100
122	-74	-90	-97	51	77	72	79	96	83	95	-72	92	36	72	45
222	-62	-96	-58	-96	1	-87	64	-15	57	-96	88	-78	-42	-82	-91
223	-	-100	-100	-100	-100	-86	-100	-100	-92	-100	-100	-100	-100	43	100
411	100	61	-98	-71	-82	100	-95	-96	5	100	-77	-100	-100	-99	100
421	99	-86	-82	-98	-100	-100	-99	-100	-100	-100	-99	-100	-100	-98	-100
422	-72	-60	-46	-86	-5	-99	-100	-100	-100	-99	-99	-100	-97	-99	-99
431	-100	100	-43	-100	-96	-97	-100	-100	-99	-86	-85	-92	-95	-100	-93
<b>Total</b>	<b>-46.8</b>	<b>-91.3</b>	<b>-67.7</b>	<b>-82.3</b>	<b>-44.5</b>	<b>-67.3</b>	<b>-69.9</b>	<b>-59.6</b>	<b>-29.7</b>	<b>-14.5</b>	<b>-50.7</b>	<b>-19.8</b>	<b>-39.1</b>	<b>-11.5</b>	<b>-15.6</b>

Source: Authors' analysis based on UNCTAD data