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# Nigeria's Export Supply versus Brazil's Import Demand: 2000-2016

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# **Abstract**

This study examined the comparative advantage of twenty major product categories exported between Nigeria and Brazil using Revealed Comparative Advantage (RCA) index, and measures the extent to which Nigeria's export supply match with Brazil's import demand using trade complementarity index (TCI) over the period 2000-2016. The result from the analysis shows that Nigeria can only competitively export mineral fuels to Brazil, while Brazil can export competitively to Nigeria products like tobacco, aluminum and articles thereof, miscellaneous edible preparations, cereals, salt, Sulphur, earth and stone, iron and steel, ores slag and ash, sugar and sugar confectionary. Neither do Nigeria nor Brazil has comparative advantage in products like plastics, paper, nuclear reactors and boilers, soap/washing preparations, fish crustacean, vehicles, railway, dairy products, articles of iron or steel, coffer, furniture, bedding, mattress, cushion etc. which implied that there is little scope for increasing their trade in these products. Evidence from the trade complementarity index reveals the existence of partial match between Nigeria's exports supply and the Brazil's imports demand, and that Brazil's exports to Nigeria are more capable of meeting Nigeria's imports demand toward Brazilian goods than that of Nigeria. The trends in Nigeria's trade complementarity index has been increasing over the study period. This an indication of compatibility of Nigeria's exports supply with Brazil's imports demand. While the trends in Brazil trade complementarity index has been fluctuating and has declined over period implying that Brazil's exports is becoming less compatible with Nigeria's imports. The study further shows that Mineral fuels has remained Nigeria's major export to Brazil and recommends that Nigerian economy should be geared toward resolving problems of low productivity in various sectors. The study also called for the need to embark on research toward identifying realistic export opportunities for Nigeria in Brazilian markets in order to boost their bilateral relations.

**Keywords:** Export supply, Import demand, Nigeria, Brazil.

# Introduction

Nigeria and Brazil has for long been in warm cultural, economic, political and

social relations. The economic and political similarities with which Nigeria and Brazil shared will yield an unprecedented trade benefit among them. By economic size and

population, Brazil is the largest in South American continent, seventh largest economy of the world, and Nigeria is the most populous country in Africa. As a result of this fact both countries were strategic players in their own regions as they remained the common future of their growth and development and economic power house of their own regions. The rise of Brazil economy will have direct bearing on Nigeria's economy through bilateral trade relations. Nigeria and Brazil share the same feature of growing exports, indicating that both countries have something to tap from each other. In the whole African continent Nigeria is the largest Brazil's trading partner as it accounts for more than half of all Brazilian import from the continent(Vincent, 2013). Similarly, Nigeria is Brazil's twelfth world largest trading partner (Garrick, 2013). In terms of crude oil import, Brazil is Nigeria's third largest importer of Nigerian crude oil after India and USA. There exist huge potentials between Nigeria and Brazil which can only be tap through strong bilateral trade relation and investment. In 2013 both countries agreed to promote strong bilateral ties that could lead to increase in trade and investment in both countries. As part of Brazil's effort to promote investment in Nigerian economy Petro bras a Brazil owned oil company have invested from 2009-2013 not less than \$2.0 billion in projects such as oil and alternative energy sectors, oil exploration, coal and natural gas (Mthuli, et al. 2011).

Nigeria has become highly attracted by not only Brazil but by emerging world economies (BRICS). The economic integration of Nigeria with the emerging world economies (BRICS) has placed Nigeria in a way that, in Africa no country is better placed to provide the necessary leadership role for the continent's trade revitalization than Nigeria, given her

enviable natural endowments and wealth of human resources (Ekesiobi, et al. 2011).

Over the last one and half decade trade between Nigeria and Brazil has recorded a tremendous increase, which is as a result of Nigeria's returned to democracy. In 2000 Nigeria's export to Brazil stood at \$667 which significantly million increased to\$7.6billion in 2016. Between 2000 and 2016, Nigeria's merchandise export to Brazil stood at \$74.5 billion. While import from Brazil in 2000 stood at \$179.1 million which hits\$731.35 million in 2016. Nigeria's import from Brazil, from the year 2000-2016 stood at \$16.31 billion. In 2016 Brazil accounts for 6.17 percent of Nigeria's total exports and 2.3 percent of Nigeria's total imports. Nigeria-Brazil bilateral trade hits \$9.50 billion in 2014 and recorded a remarkable growth of 1022.7 percent from 2000-2014 (Ibrahim & Abdulaziz unpublished data). Over the period 2000-2016, the balance of trade has been in favour of Nigeria as it exports more than it imports from Brazil.

Despite the growing importance of Nigeria-Brazil bilateral trade relations over the last one and half decade empirical studies have not been conducted in the area. Documents on Nigeria-Brazil trade were non-scholarly, non-empirical, news articles as well report Nigerian-Brazilian from Chamber Commerce and Industry (NBCCI), Nigerian-Brazilian embassies, blogs materials from the internet which are not focus to quality control and are therefore not reliable. This constitutes a huge gap in literature with which this study will start to fill. The only studies reviewed similar to the current study include (Abiodun, 2011), which focused on Nigeria and BRICS trade relations, (Idris & Chukwuka 2014; Ibrahim& Dilfraz 2014; Ibrahim 2015); that focused and analyzes the trends, composition, trade intensity and

established complementarity and similarity of Nigeria-India bilateral trade relations, Nigeria-Poland bilateral trade relations using tradeintensity index, revealed comparative advantage index and trade complementarity index. As against this background the rationale behind this study would be to:

- i. Identify commodities with comparative advantage in Nigeria-Brazil trade.
- ii. Find out areas of complementarity and similarity of Nigeria-Brazil trade given the commodities with comparative advantage.
- iii. Establish the extent of match (and mismatch) of Nigeria's export supply and Brazil's import demand.

# **Method of Analysis**

This study solely relied on secondary data which were obtained from UNCOMTRADE and accessed via world integrated trade solutions (WITS). The data were collected for the periods 2000-2016, in order to analyze commodities with comparative advantage with which Nigeria and Brazil exported to each other and at the same time to analyze trade complementarity between Nigeria and Brazil. The study analyzed twenty major products category at HS 2 digit level. The products categories were selected based on their performance in Nigeria-Brazil trade over the study period.

Revealed Comparative Advantage (RCA) Index proposed by Balassa (1965)was adopted. The Revealed Comparative Advantage (RCA) index is used to find the competitive advantage in commodities or product category with which Nigeria and Brazil exported to each other. Countries with high revealed comparative advantage in the production of a given commodity can export it to countries with low revealed comparative advantage, and countries with

similar revealed comparative advantage are likely to trade less in a given product category. The revealed comparative advantage (RCA) index can be calculated for Nigeria and Brazil as follows;-

$$RCA_{nj} = \frac{Xnj/Xnt}{Xwi/Xwt}$$

Where;-RCA<sub>nj</sub> = Nigeria's revealed comparative advantage index of product j,  $X_{nj}$  = Nigeria's export of product j,  $X_{nt}$  = Nigeria's total exports,  $X_{wj}$  = World's export of product j,  $X_{wt}$  = World's total export.

When the value of RCA index is less than one, it implies that the country concerned has a revealed comparative disadvantage in the production and exportation of the product. While an RCA value of greater than one implies that the country has a revealed comparative advantage in the product. An RCA of 1 imply comparative neutrality.

The second method of analysis adopted was the trade complementarity index. The index shows the degree to which two countries are natural trading partners. When the exports of one country coincides with the imports of its trading partner then trade complementarity exists. In this case trade complementarity sectorial composition shows how Nigeria's export supply match with Brazil's import demand. If there is a miss-match between Nigeria's exports supply and Brazil's imports demand then there is absence of trade complementarity in such a situation there would be low opportunities for Nigeria's export supply to Brazilian markets. The trade complementarity index between Nigeria and Brazil can be defined as;-

$$TC_{nb} = 100[1 - \Sigma (|X_{nk} - M_{bk}|)/2]$$

Where:  $-TC_{nb}$  = Nigeria's trade complementarity with Brazil, $X_{nk}$  is sector k's share in Nigeria's total exports to the whole

world, M<sub>bk</sub> is sector k's share in Brazil total imports from the whole world. The index will also serve as a measure of adequacy of Nigeria's exports supply in meeting Brazil's imports demand. If there is a perfect positive correlation the index is 100 and with perfect negative correlation the index is zero. An index of 25 which is low but greater than zero and less than 100 implies low positive correlation and inadequacy of Nigeria's exports supply in meeting Brazil's imports demand. While an index of 75 which is high or nearly close to 100 indicates high positive correlation and high capability of Nigeria's exports in meeting Brazil's imports demand.

### **Presentation and Analysis**

Table 1, shows Nigeria and Brazil mean revealed comparative advantage of twenty major products category exported to each other between 2000 and 2016. Table 2, shows the trade complementarity index which is a measure of exports and imports match between Nigeria and Brazil over the period 2000-2016, while Table 3 presents the average of these indices in order to have common measure of complementarity over the study period. Table 4, shows the actual sectorial match and mismatch of Nigeria's export supply with Brazil's import demand in order to provide enough support complementarity indices obtained in Table 2 and Table 3. The trends in the trade complementarity indices were also presented in Figure 1 and Figure 2 in order to clearly see and observe the compatibility of Nigeria and Brazil exports and imports over the study period.

Table 1, shows the mean revealed comparative advantage of Nigeria and Brazil in twenty major product categories over the

period 2000-2016. In mineral fuels Nigeria has a mean RCA index of 8.13and Brazil has RCA index of 0.59 which implied that Nigeria has more comparative advantage than Brazil and it can export mineral fuels to Brazil. Brazil enjoyed comparative advantage in tobacco and manufactured tobacco, aluminum and articles thereof, miscellaneous edible preparations, cereals, salt, Sulphur, earth and stone, iron and steel, ores slag and ash, Art of stone, plaster, cement, sugar and sugar confectionary and can export these products to Nigeria.

Neither do Nigeria nor Brazil has comparative advantage in products like plastics and articles thereof, paper and paperboard, nuclear reactors and boilers, soap and washing preparations, crustacean and aquatic invertebrate, vehicles, railway tram, roll-stock and parts, dairy products, bird's eggs and natural honey, articles of iron or steel, coffer and articles thereof, furniture, bedding, mattress, cushion etc. In this case there is little scope of increasing Nigeria-Brazil trade in these because products ofabsence complementarity of trade, but there is scope of increasing their trade with other countries with high RCA index in these products. Nigeria has competitive advantage in only one products while Brazil has competitive advantage in nine products out of the twenty major products categories.

Nigeria's export is less diversified compared to Brazil export which further implied that the scope of increasing Nigeria's export to Brazil is less than that of increasing Brazil export to Nigeria and this is attributed to low productivity and monocultural nature of Nigerian economy and a more diversified nature of Brazilian economy.

Table 1: Nigeria and Brazil Mean Comparative Advantage of 20 major products (2000-2016)

PRODUCTS CATEGORY	NIGERIA	BRAZIL
Mineral fuels	8.13	0.59
Tobacco and manufactured tobacco	0.32	5.11
Plastics and articles thereof	0.04	0.49
Aluminum and articles thereof	0.14	1.22
Miscellaneous edible preparations	0.02	1.61
Paper & paperboard	0.01	0.80
Nuclear reactors & boilers	0.02	0.47
Cereals	0.03	1.97
Soap & washing prep. etc.	0.04	0.41
Fish, crustacean & aquatic invertebrate	0.24	0.38
Vehicles, railway tram, roll-stock & pts	0.00	0.72
Salt; Sulphur; earth & stone etc.	0.03	1.50
Iron and steel	0.01	2.08
Dairy prod; birds' eggs; natural honey	0.13	0.30
Ores, slag and ash	0.05	10.44
Art of stone, plaster, cement etc.	0.01	1.93
Articles of iron or steel	0.03	0.52
Copper and articles thereof	0.08	0.44
Sugars and sugar confectionary	0.03	15.40
Furniture; bedding, mattress, cushion etc.	0.03	0.48

Source: Authors' own calculation from UNCOMTRADE dated 10/05/2017.

In Table 2, there is a partial match between Nigeria's exports supply and the Brazil's imports demand as the indices are between 0 and 100. Throughout the whole periods 2000-2016, the indices lies between 14.25 34.27, implies and this that complementarity of Nigeria-Brazil trade remained very low. In case of Brazil, despite the partial match of exports and imports (demand and supply) the trade complementarity indices are stronger than that of Nigeria. This is because the indices lies between 37.51 and 52.44. The result revealed that Brazil's exports to Nigeria are more capable of meeting Nigeria's imports demand toward Brazilian goods than that of Nigeria. This also was in support of comparative advantage products computed in Table 1, of this study, and the findings of (Ibrahim & Abdulaziz unpublished data), which shows composition of Nigeria-Brazil trade over the periods 2000-2014

Table 2: Nigeria and Brazil trade complementarity index over the period 2000-2016

Year	Nigeria's TCI with Brazil	Brazil's TCI with Nigeria
2000	15.19	51.98
2001	14.25	52.44
2002	16.70	49.20
2003	16.33	48.72
2004	19.01	50.47
2005	20.34	52.52
2006	19.57	48.14
2007	21.47	48.93
2008	23.60	43.21
2009	19.34	39.83
2010	21.73	37.51
2011	23.18	45.72
2012	23.18	45.72
2013	25.56	48.07
2014	22.85	46.36
2015	34.27	50.63
2016	13.46	44.49

Source: Authors' own computation from UNCOMTRADE dated 06/05/2017.

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Table 3: Mean Trade Complementarity Index of Nigeria and Brazil, 2000-2016

	Nigeria's mean TCI with Brazil	Brazil's mean TCI with Nigeria
Mean TCI	20.59	47.29

Source: Authors' own computation from UNCOMTRADE dated 06/05/2017.

The mean trade complementarity index in Table 3, shows on the average the strength of Nigeria's exports supply in meeting Brazilian imports demand as well the strength of Brazil's exports supply in meeting Nigerian imports demand toward Brazilian products over the period 2000-2016. The mean trade complementarity index for Nigeria is 20.59 and for Brazil is 47.29. This implies that Brazil's exports

supply to Nigeria are more capable of meeting Nigeria's imports demand than Nigeria's exports supply in meeting Brazil's import demand. This result is also in line with the result obtained in Table 2. This low trade complementarity index possessed by Nigeria was attributed to low productivity and mono-cultural nature of Nigerian economy.

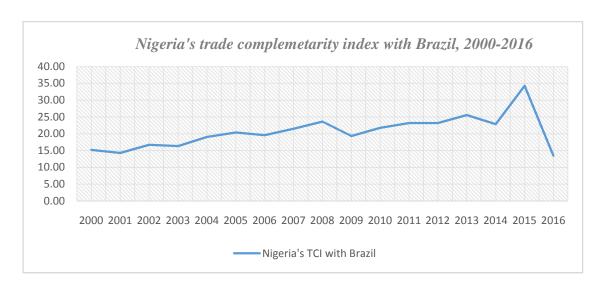


Figure 1: Trends in Nigeria's trade complementarity with Brazil, 2000-2016. Source: *Authors' own computation from UNCOMTRADE dated 06/05/2017*.

Figure 1, shows that Nigeria's exports supply, only partially matches with Brazil's imports demand throughout the period 2000-2016. Despite the partial match between exports supply and imports demand the index has been increasing over the period 2000-2015 and tremendously declined in 2016. This steady rise in trade complementarity index is as a result of the role of mineral fuels in Nigeria's exports to Brazil, which on average from 2000-2014 accounts for 99 percent of the total worth of goods exported to Brazil (Ibrahim & Abdulaziz unpublished data). The trends revealed an increase in the indices from 2000-2015, implying that Nigeria's exports supply are becoming more compatible with Brazil's imports demand. From 2015 to 2016 the index has declined from 34.27 to 13.46 which was as a result of 2015-2016 declined in oil prices coupled with crises in oil producing regions.

Figure 2,shows the trends in Brazil's trade complementarity with Nigeria. It shows that Brazil's exports supply remains partially match with Nigeria's imports demand over the period. The index has been fluctuating throughout the period. The result shows that over the period 2000-2016, the index has declined from 51.98 to 44.49 implying that Brazil's exports is becoming less compatible with Nigeria's imports.

Table 4, shows that Nigeria's major exports are mineral fuels throughout the whole selected periods i.e. 2000, 2007, 2014 and 2016 this also matched with Brazil's major imports of mineral fuels especially in 2007 and 2014. But there is mismatch in the second and third major products in the Nigeria's exports and Brazil's imports. This result is also in line with the result presented in Table 2 and Table 3, which shows the existence of partial match between Nigeria's export supply and Brazil's import demand.

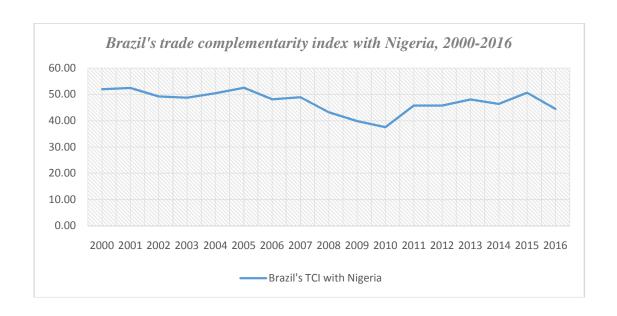


Figure 2: Trends in Brazil's trade complementarity with Nigeria, 2000-2016. Source: Authors' own computation from UNCOMTRADE dated 06/05/2017.

Table 4: Nigeria's major exports versus Brazil's major imports, 2000, 2007 & 2016

	2000	2007	2014	2016
Nigeria's Major Exports	Mineral fuels (99%)	Mineral fuels (94%)	Mineral fuels (91%)	Mineral fuels (91%)
•	Oil seed, oleaginous fruit, seed, fruit etc. (0.10%)	Cocoa and cocoa preparations (1%)	Ships, boats and floating structures (2%)	Cocoa and cocoa preparations (1.4%)
	Ships, boats and floating structures (0.07%)	Raw hides and skins & leather (1%)	Explosive; pyrotechnic, matches (2%)	Oil seed, oleaginous fruit, seed, fruit etc. (0.8%)
Brazil's Major Imports	Electrical machinery & equipment (16%)	Mineral fuels (19%)	Mineral fuels (20%)	Nuclear reactors & boilers (15%)
	Nuclear reactors & boilers (16%) Mineral fuels (15%)	Nuclear reactors & boilers (15%) Electrical machinery & equipment (12%)	Nuclear reactors & boilers (14%) Electrical machinery & equipment (12%)	Electrical machinery & equipment (12%) Mineral fuels (11%)
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Source: Authors' own computation from UNCOMTRADE dated 10/05/2017.

#### Conclusion

Two main conclusions were drawn from this study, firstly, the result from the analysis of

twenty major products category exported to Brazil revealed that Nigeria can only competitively export mineral fuels to Brazil because the country is mono-cultural and solely relied on crude oil export. Brazil enjoyed more comparative advantage because its economy is more diversified than that of Nigeria.Brazil can competitively export to Nigeria products liketobacco, aluminum and articles thereof. miscellaneous preparations, cereals, salt, Sulphur, earth and stone, iron and steel, ores slag and ash, Art of stone, plaster, cement, sugar and sugar confectionary. Neither do Nigeria nor Brazil has comparative advantage in products like plastics and articles thereof, paper and paperboard, nuclear reactors and boilers, soap and washing preparations, fish crustacean and aquatic invertebrate, vehicles, railway tram, roll-stock and parts, dairy products, bird's eggs and natural honey, articles of iron or steel, coffer and articles thereof, furniture, bedding, mattress, cushion etc. In this case there is little scope of increasing Nigeria-Brazil trade in these products because of absence of complementarity of trade, but there is scope of increasing their trade with other countries with high RCA index in these products. Nigeria's export is less diversified compared to Brazil export which further implied that the scope of increasing Nigeria's export to Brazil is less than that of increasing Brazil export to Nigeria and this is attributed to the lack of productivity in various sectors mono-cultural nature of Nigerian economy and a more diversified nature of Brazilian economy.

Secondly, the trade complementarity index reveals the existence of partial match between Nigeria's exports supply and the Brazil's imports demand as the indices lies between 14.25 and 34.46, this implies that the complementarity of Nigeria-Brazil trade remained very low. In case of Brazil, despite the existence of partial match of exports and imports the trade complementarity indices are stronger than that of Nigeria. This is because the indices lies between 37.51 and 52.44. The result revealed that Brazil's exports to Nigeria

are more capable of meeting Nigeria's imports demand toward Brazilian goods than that Nigeria. The mean trade complementarity index for Nigeria is 20.59 and for Brazil is 47.29 over the period 2000-2016. This implies that Brazil's exports supply to Nigeria are stronger in meeting Nigeria's imports demand than Nigeria's exports supply in meeting Brazil's import demand. This low trade complementarity index possessed by Nigeria has been attributed to low level of productivity and mono-cultural nature of Nigerian economy through over dependence on oil sector. The trends in Nigeria's trade complementarity index has been increasing over the period 2000-2015 despite the existence partial match between Nigeria's exports supply and Brazil's imports demand. This steady rise in trade complementarity index is as a result of the role of mineral fuels in Nigeria's exports to Brazil, which on average accounts for 99 percent of the total worth of goods exported to Brazil from 2000-2014, (Ibrahim & Abdulaziz unpublished data). This rising trend implied that Nigeria's exports supply are becoming more compatible with Brazil's imports demand. The trends in Brazil trade complementarity index has been fluctuating throughout the period and has declined from 51.98 to 44.29 over the period 2000-2016, implying that Brazil's exports is becoming less compatible with Nigeria's imports. Mineral fuels has remained Nigeria's major export to Brazil throughout the study period, which at the same time remained the major import of Brazil over the study period.

#### Recommendations

Based on the result obtained, the study recommends that Nigerian economy should be geared toward addressing problems of low productivity in the various sectors. This is because of the fact that, of all the twenty major product categories exported to Brazil only mineral fuels seems to play a major significant role. The competiveness of mineral fuels export to Brazil has not been stable over the study period which is an indication of the need, for the country to focuson other viable sectors that would help in boosting the non-oil exports. Evidence trends of Nigeria's from the complementarity index reveals that Nigeria's exports supply to Brazil is becoming more compatible to Brazil's import demand despite the existence of partial match between Nigeria's export supply and Brazil's import demand. Therefore, with this fact, Nigerian government, policy makers and exporters should emphasize on not only diversifying exports or boosting the productive capacity of the economy but also on identifying realistic export opportunities for Nigeria's exports in Brazilian markets. This will help in Nigeria-Brazil strengthening bilateral relations and reduced the current crises of foreign exchange confronting Nigerian economy.

To address the challenges of low productivity in Nigerian economy which has resulted to low competitiveness of Nigeria's major products exported, policy should be put in stimulate and enhance place to competitiveness of the real sector of the economy. This will increase the productivity manufacturing thereby of sector and stimulating both domestic and foreign trade and improve on the current state of Nigerian economy.

A comprehensive policy toward public and private partnership should be encourage to enhance the production of key selected products that would better the competiveness of Nigeria's exports in the world markets.

Foreign direct investment (FDI) should be encourage in the country because of its strong link with productivity and export growth. This effort has been hampered by corruption in the country but there is strong level of optimism that the root cause of corruption would be dealt with, to target the required level of investment.

#### Area of future work

Low level of diverse products in Nigeria's export to Brazil has been attributed to lack of explanatory researches toward identifying realistic trade opportunities. To this end there is need to extend this study to empirically identify realistic export opportunities for Nigeria's products in Brazilian market. This will help the policy makers in knowing the sectors to give priority to in diversifying Nigerian economy.

The study also recommends that future work should extend the study toward applying suitable econometric techniques in order to make an extensive analysis of the factors determining Nigeria's exports supply as this will assist in designing further practical policy recommendations that could enhance Nigeria's export supply, to not only Brazil, but to the world in general.

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