

Economic Determinants of Nigeria's Trade with China: A Cointegration Approach

Nnanna P. Azu¹ & Eche Abu-Obe²

¹ School of International Economics and Trade, Dongbei University of Finance and Economics, Dalian, China

² Embassy of the Federal Republic of Nigeria, Beijing, China

Correspondence: Nnanna P. Azu, School of International Economics and Trade, Dongbei University of Finance and Economics, Shahekou District, Dalian 116025, China. E-mail: phil4azu@yahoo.com

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Abstract

The China-Nigeria trade volume has been increasing over the years with no signs of slowing down any time soon. This work examined the long-and-short run economic catalysts that stimulate this trade relation with focus on Nigeria's economic factors as well as the Third Country's Factors. Japan's REER was adopted as a Third Country's Factor and Johansen and Juselius cointegration technique was used to determine the result. The outcome revealed that GDP, trade openness and FDI inflow possess significant positive influence on China-Nigeria trade relations while bilateral exchange rate and Third Country's Factor are negative determinants, suggesting that improvement in domestic prices and increased real exchange rates of Japan could undermine China-Nigeria bilateral trade, howbeit, in the long-run. So, both countries should gear towards improving domestic prices, efficiency and competitiveness relative to the Third Country's Effect to curtail its excessive influence on bilateral trade and particularly, Nigeria should focus on redefining its business environment politically and otherwise to attract further FDI and ameliorate its trading sector.

Keywords: third country's factor, China-Nigeria, trade determinants, REER

1. Introduction

In recent time, the presence of made in China goods and services have continued to surge in spite various political turmoil as well as incessant unrest in some parts of Africa. Nigeria in particular has witnessed insecurity at a scale that has menaced the country at various times. Many China-made products; ranging from consumer goods to industrial goods have attracted some condemnation from different quarters with regards their inferior quality but some of these goods are still being well appreciated. Admitting the menace, Deng Boqing, the Chinese Ambassador to Nigeria in July 2013 stressed that Africa has become vulnerable to most sub-standard goods from China but pointed that the Chinese government was deeply concerned about it. Information released by the Office of the Economic and Commercial Councillor of Chinese Embassy in Nigeria and made available by MOFCOM on July 22, 2014, recorded that since 2011, China-Nigeria bilateral trade totalled over \$10.78b, exceeding 10 billion US dollars for the first time and grew to \$13.6b in 2013 (information also available on Nigeria trade hub). These figures reveal that Nigeria is understandably China's second export market in Africa, only next to South Africa (see Figure 1) and third largest trading partner in Africa. In addition, China is gradually becoming Nigeria's No. 1 source of imports. China mainly imports crude oil, LNG and other hydrocarbon gases from Nigeria, while China's main export to Nigeria are electronics and machinery, textile yarn, woven fabrics and high-tech products which incites China's technological superiority over Nigeria.

Moreover, the intensity of Nigeria's import from China has been high and rising tremendously over the years compared to Nigeria's export to China, implying that Nigeria has seemingly exported less to China than it ought to, (Adewuyi et al., 2010), the consequences of which are the reported trade deficits over the years as shown in Fig 2, which has amounted to US\$14.58B in 2014 with bilateral trade reflecting US\$16.99B while Nigeria's export to China is valued at US\$2.4B, thus in affirmation to Gregory (2009). He likened China's relationship with any African country and Nigeria in particular to that of an ant and an elephant. Fig 2 also revealed no signs of slowing down irrespective of the aforementioned rising trade deficit between Nigeria and China over the years. Government should be concerned about its trade deficit says Jonathan (2010), as most trade deficits in bilateral trade with China has been attributed to existing China's exchange rate regime (Abdol, 2009), but Mckinnon

(2006) argues that the fundamental cause of China's excessive trade surplus with most trade partners like United States is US excess consumption coupled with China's excess saving. Howbeit, Aviral (2012) pointed out that trade deficits are sustainable and also surmountable by individual government policies and programs.

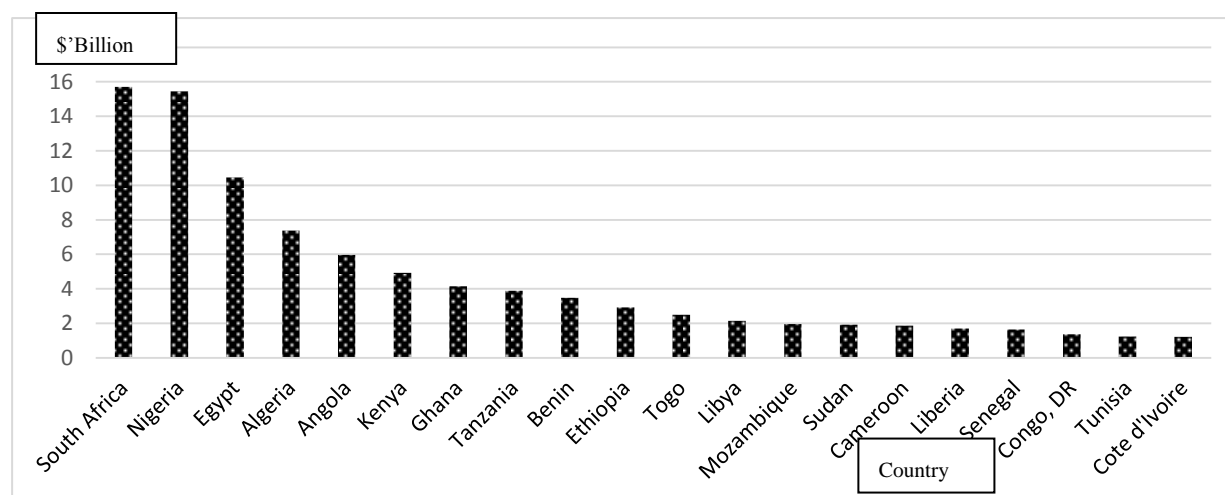


Figure 1. Top 20 China's export destination in Africa in 2014

Data Source: IMF-IFS.

However, the aim of this research is not to analyse the causes of China-Nigeria trade deficit but rather to evaluate some economic determinants of the bilateral trade. Most academic studies in relation to China-Nigeria trade have mostly centred on the trend, effects cum benefits Adewuyi et al. (2010), Nabine (2009), Mathias et al. (2012), Daniel and Maiwada (2015) and Udeala (2010), with less attention to some variables that stimulate this immense cooperation between the two nations. Most authors have identified GDP or Per capita GDP of the importing and exporting countries as major trade determinants, (Tinbergen, 1962; Poyhonen, 1963; Linnenman, 1966; Wall, 1999; Sebbagh et al., 2015), though Elawady and Abdulkheir (2015) argued it is less important. Indeed trade openness, FDI and exchange rate are also major determinants of trade flows between nations (See Jiranyakul & Brahmabrene, 2002; Nguyen, 2010; Swenson, 2004; Fontagne, 1999; and Azu & Nasiri, 2015). Focusing on Nigeria's economic factors, this paper will absorb these major trade determining variables such as GDP, exchange rate, openness, FDI inflows. It will also be pertinent to highlight the short-and-long run impact of the third country's trade partner which is envisaged to often being neglected in most bilateral trade researches, aiming at enlightening policy makers and stakeholders alike, stressing that despite controllable domestic factors impeding or enhancing China-Nigeria bilateral trade, activities of the trading partner could as well be a threat.

Be that as it may, rising GDP signifies an increase in consumptions-market increases; hence growing Nigeria GDP can be seen as a major attraction of China-Nigeria trade. In recent past Nigeria has patronised China not only in services but also in commercial and technological goods that comes with FDI inflows giving room for this paper to consider FDI inflow as a major determinant of China-Nigeria trade and besides, the offspring of FDI can be exported as well. Also, trade openness is one measure of economic policy that encourages or restricts bilateral trade and this research will like to determine how Nigeria's trade openness has played its role in facilitating her bilateral trade with China. And one of the factors that will be given cognisance is the Naira-Renminbi fluctuation. Though international trade is done with the US dollar as the vehicle currency, the changes in Naira and Renminbi in the exchange market compared to each other will be worth considering. Lastly, within South East Asia, Japan is visualised as major competitor to China's export to Nigeria and major importer of Nigerian goods which indicates that Nigeria-Japan trade is more diversified than that of Nigeria-China, though shifting and less progressive in recent years. Hence, the research will take Japan REER as a third country's competitive factor since, according to WTO; 'REER is a measure of domestic economy's price competitiveness vis-à-vis its trading partners'. One should also note that when nominal exchange rate rises, the real exchange rate appreciates, then the economy losses its competitiveness as also illustrated by WTO. It is against this background that the research justifies the inclusion of Japan's REER as Third Country's Factor.

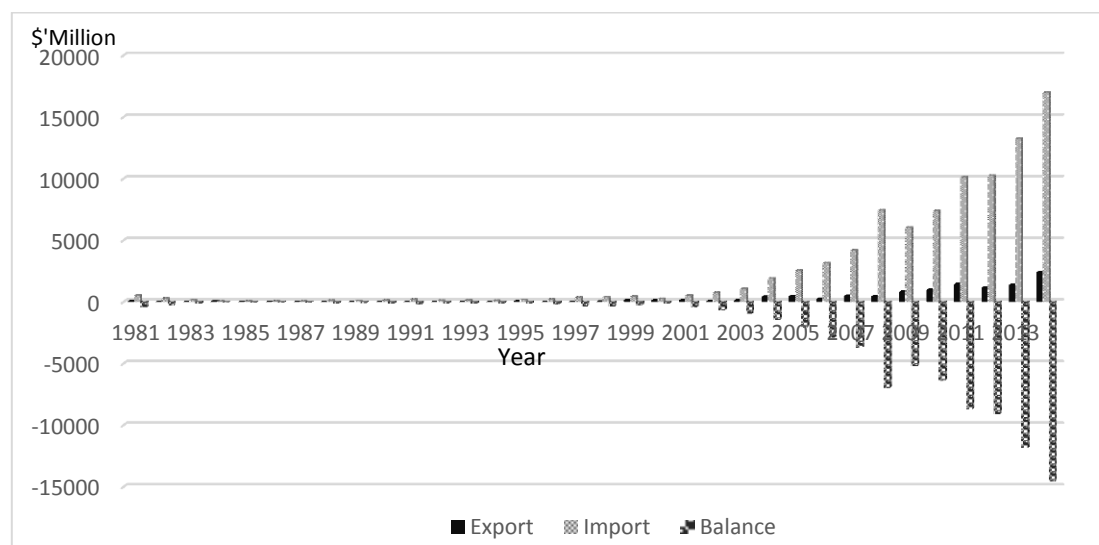


Figure 2. China-Nigeria trade pattern

Data Source: IMF-IFS.

The remaining part of the paper will be segmented into 4 sections, with literature review impendent, the third section will concentrate much on the research methodology while the fourth section will relay the outcome of the empirical analysis and finally the last section will outline the conclusions.

2. Literature Review

In trade theories, the popular and dominant basis of trade determinants includes but is not limited to absolute advantage, comparative advantage and the labour theory of value, pattern of trade, trade regimes and trade facilitation. Adam Smith's absolute advantage is geared at encouraging and increasing specialization between two nations, where a nation specializes in the production of the product of its absolute advantage and exchanging part of its output with another nation for the products of which it has absolute disadvantage. Similarly, comparative advantage results from differences in labour productivity between countries as stated in David Ricardo's Comparative Cost Advantage Theory (further explained by Habeler 1936 as Opportunity Cost Theory). Heckscher and Ohlin trade model examines the differences in countries' resource endowments; hence the exploitation of economies of scale or the availability of increasing returns to scale of production (New Trade theory-see Markusen et al., 1995; Krugman & Obstfeld, 2008). Invariably, countries endowed with natural resources will tend to have absolute and cost advantages which ensure her specialisation in furtherance to its engagement in foreign trade. A handful of other empirical works on international trade that could be credited to Complete specialization are Anderson (1979), Anderson and Wincoop (2003), Bergstrand (1985), and Eaton and Kortum (2002), to mention but a few.

Most nations anchored their trade policy towards economic development and strategy by either promoting export or encourage importation of certain products which will go a long way to determine the kind of trade barriers or restriction to be utilized and which areas will be or are covered by various trade agreements and FTAs, international trade agreements and development of free trade zones like the case of China and Nigeria. Therefore, determining the various factors that can improve or deter bilateral trade relations become imperative and fitted as a round peg in a round hole. (See Tinbergen, 1962; Poyhonen, 1963; Wall, 1999; Nguyen, 2010). Mostly, these authors have made their marks by including both economic and institutional factors that determine bilateral trades. The rapid increase in China-Nigeria trade and peculiar nature in economic growth between these two nations have prompted this research to consider economic factors that may impair or accelerate this trade relation.

A good number of researchers have aired their opinions on bilateral trade determinants. Nguyen (2010) while reviewing Vietnam and 15 partners in trade posited that the exports from previous periods matter to current export volume and went further to buttress that economic size is positively related to trade while trade costs have significant and negative relations to trade, but exchange rates do have significant influence though the magnitude of such influence remains minor. In the same vein, Jinhwar and Orgilbold (2011) considered Mongolia and its 59 trading partners and concluded that trade openness, economic size and development measured in GDP per capita

and bilateral trade largely possess significant control on trade across borders. Likewise, Antonucci and Manzocchi (2006) studied Turkey's bilateral trade with EU and the result revealed that economies sizes, per capita income are crucial determinants of trade and Tovonjatorovo and Yinguo (2015) concur that those factors determine export alongside terms of trade and farm gate price which possess negative influence. However, Swenson (2004), Fontagne (1999) and Azu and Nasiri (2015) justified that FDI has considerable impact on volume of trade. Other researches that believed that economic sizes, distances, trade resistance factors, have considerable influence in trade between two countries include (Tinbergen, 1962; Poyhonen, 1963; Linnenman, 1966; Wall, 1999). Deardoffs (1995) agreed that trade impediment factors such as tariff and transport could determine bilateral trade volumes.

Moreover, evidence from Jiranyakul and Brahmabrene (2002) reasoned that real exchange rates, domestic and foreign incomes are principal determinants of Thailand's import and export flow with its major partners in trade, supported by recent views emanating from Sebbagh et al. (2015) which finds that there exists positive impacts of gross domestic product (GDP) and a negative effect with exchange rate, which is not in tandem with Elawady and Abdulkheir (2015) who oppose the fact that GDP of both importing and exporting countries are less important but just like Hailu (2015) also accepts that exchange rate has negative influence on export. Such is the argument in research as each scholar tries to justify peculiar economic situations in relation to bilateral trade. This paper will tend to borrow most of these economic factors in evaluating the determinant of China-Nigeria trade with much emphasis on Nigeria and third country's economic factor which has by and large been overlooked by these authors.

3. Data and Methodology

3.1 The Model

Modern academic work on the stimulants of bilateral trade flow have mostly centred on the popular gravity model which tends to accommodate some variables like distance, language, border and many other institutional drivers as highlighted in some literatures discussed above. However, the use of gravity model will be wholesome and encompassing; the context of this research will assume some of those variables as constant across years. Having said that, while many authors have considered GDP, openness, exchange rate and FDI as major determinants of bilateral trade, this paper will not only adopt these variables but would also like to argue that bilateral trade can also be affected by activities of third party major trade competitor's influence with Japan's REER being our main focus herein. The analytical equation will be derived thus:

$$Trade = f(GDP_i, OPEN_i, EXC_{ij}, FDI_i, REER_x) \quad (1)$$

Explicitly rewritten as:

$$\ln T_{ijt} = \alpha + \beta_1 \ln G_{it} + \beta_2 O_{it} + \beta_3 X_{ijt} + \beta_4 \ln F_{it} + \beta_5 \delta_{jt} + \varepsilon_{ijt} \quad (2)$$

Say, i = Nigeria, j = China, t = time in Quarters. Where T_{ijt} represent Trade (trade volume between China and Nigeria) in a given quarter, G_{it} would represent Nigeria Gross Domestic Product (GDP) in a given quarter, O_{it} stands for Nigeria Openness to trade, X_{ijt} is the bilateral exchange rate between Nigeria and China ($\text{₦}/\text{¥}$), F_{it} is inward FDI flow to Nigeria measured quarterly, δ_{jt} symbolically represents Japanese REER in quarterly time, which stands for a third party bilateral factor in this research and ε_{ijt} means error term.

3.2 Data and Source

All data collected are quarterly, ranging from 1992 to 2014. The analysis will be done with the aid of e-views 9 version unless where stated otherwise. Large data variables such as GDP, FDI and Bilateral trade will be transformed to natural logarithm while others remain unadjusted since they are ratio or indices. Table 1 show the variables, anticipated signs and the sources.

Table 1. Data and sources

Variables	Sources	Signs	Remarks
Bilateral Trade	IFS IMF	>0	China export to Nigeria + Nigeria export to china
GDP	CBN	>0	GDP as nominal
Bilateral Exchange rate	IFS IMF	<0/>0	Ratio of $\text{₦}/\text{\$}$ to $\text{¥}/\text{\$}$
Openness	IFS IMF / CBN	>0	Total Export + Total Import / Total GDP
FDI	UNCTAD	>0	Annual converted by ipolation using stata 12
Japan REER	IFS IMF	<0	Third country effect

3.2 Stationarity/Unit Root Test

As a matter of necessity, unit test is conducted to determine the stationarity of the variables; the paper will adopt Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) as a confirmation test. Estimation based on ADF regresses as:

$$\Delta X_t = \lambda_0 + \lambda_1 + \lambda_2 X_{t-1} + \sum_{j=1}^k \alpha_j \Delta X_{t-j} + \varepsilon_t \quad (3)$$

Where, Δ stands for first difference operator, X_t represents the series, $\lambda_0, \lambda_1, \lambda_2$ are to be estimated and ε_t is the error term. The null and alternative hypotheses for stationarity in variable X_t indicated $H_0: \lambda_2=0$ against $H_1: \lambda_2<0$. The authors' choice for PP to reconfirm the outcome of the ADF is due to the fact that PP does not need to assume for homoscedasticity of the error term, the test does correct the serial correlation as well as the autoregression hetero-scedasticity of all the error term in the variables.

Table 2. Descriptive statistic and correlation

Variables	$\ln T_{ijt}$	$\ln G_{it}$	O_{it}	X_{ijt}	$\ln F_{it}$	δ_{xt}
Mean	19.68134	28.52412	0.437392	26.00248	10.29677	103.423
Median	19.51179	28.53802	0.465471	22.60251	10.22519	102.5625
Maximum	22.3757	30.81762	0.757983	59.90073	11.41419	145.9555
Minimum	16.28108	26.01178	0.092175	9.965897	9.205496	71.06941
Std. Dev.	1.72671	1.269619	0.192498	11.227	0.600599	15.28758
Skewness	-0.09816	-0.14752	-0.36726	0.957536	0.241901	0.188964
Kurtosis	1.725952	2.25755	1.962194	3.72583	2.155638	2.896505
Jarque-Bera	6.369994	2.446742	6.19679	16.07826	3.630211	0.588574
Probability	0.041378	0.294237	0.045122	0.000323	0.162821	0.745062
Sum	1810.684	2624.219	40.24005	2392.228	947.3033	9514.917
Sum Sq. Dev.	271.3189	146.6858	3.372053	11470.14	32.82549	21267.62
N	92	92	92	92	92	92
$\ln T_{ijt}$	1					
$\ln G_{it}$	0.971927	1				
O_{it}	0.576664	0.454162	1			
X_{ijt}	-0.28973	-0.37576	0.298621	1		
$\ln F_{it}$	0.960128	0.975697	0.428733	-0.33581	1	
δ_{xt}	-0.75111	-0.74786	-0.36481	0.205926	-0.68316	1

Source: Authors computation with the aid of Eviews 9.0.

3.3 The Johansen and Juselius Cointegration Approach

After determining the integration order, cointegration test will be implemented following Johansen and Juselius technique per Johansen and Juselius (1990). Trace and Max-Eigen Tests will be conducted to detect the number of cointegrating vector. The variables are necessarily required to be stationary in the same order of integration (that is integrated of order $I(1)$ or $I(0)$) hence, compulsorily pretesting for unit root following the methodology described above.

3.4 Vector Error Correction Model (VECM)

After determining the presence of cointegration, it become imperative to ascertain the long-and short-run coefficients of which two equations are apparent:

- (a) The long-run equation which is exactly the same as equation (2) above:

$$\ln T_{ijt} = \alpha + \beta_1 \ln G_{it} + \beta_2 O_{it} + \beta_3 X_{ijt} + \beta_4 \ln F_{it} + \beta_5 \delta_{xt} + \varepsilon_{ijt} \quad (4)$$

- (b) The short-run often referred to as Vector error-correction equation.

$$\Delta \ln T_{ijt} = \alpha + \sum_{i=1}^m \beta_1 \Delta \ln G_{it} + \sum_{i=1}^m \beta_2 \Delta \ln O_{it} + \sum_{i=1}^m \beta_3 \Delta \ln X_{ijt} + \sum_{i=1}^m \beta_4 \Delta \ln F_{it} + \sum_{i=1}^m \beta_5 \Delta \ln \delta_{xt} + \beta_6 EC_{m-1} + \varepsilon_{ijt} \quad (5)$$

Where as usual, Δ is the difference operator, m stands for the number of lags, EC_{m-1} is the error term emanating from the long-run relationship and ε_{ijt} represents the stochastic error term with zero (0) means and constant variance which make it BLUE.

Table 3. Univariate Unit Root Test (ADF & Phillips-Perron)

Variables	Level		1st Difference		2nd Difference	
	ADF	PP	ADF	PP	ADF	PP
Constant Only						
$\ln T_{ijt}$	-0.22718	-1.26153	-9.99954***	-32.3017***	-7.82199***	-48.255***
$\ln G_{it}$	-0.82222	-0.82384	-10.0013***	-10.0013***	-10.1276***	-79.7677***
O_{it}	-1.47704	-1.47704	-8.51944***	-8.50656***	-8.6667***	-40.125***
X_{ijt}	-2.22502	-2.45324	-9.28295***	-9.36095***	-8.12212***	-32.0529***
$\ln F_{it}$	-0.3232	-0.14987	-3.46423**	-3.58716***	-10.0721***	-10.0782***
δ_{xt}	-1.50324	-1.07917	-4.26182***	-7.82601***	-14.1555***	-56.8533***
Constant and Trend						
$\ln T_{ijt}$	-6.41526***	-6.41526***	-6.5843***	-32.2506***	-7.7592***	-47.828***
$\ln G_{it}$	-2.83111	-2.79512	-9.95617***	-9.95617***	-10.067***	-78.2979***
O_{it}	-1.14556	-1.14556	-8.47455***	-8.45918***	-8.60779***	-38.5526***
X_{ijt}	-2.07362	-2.34799	-9.41973***	-9.42391***	-8.07419***	-31.5408***
$\ln F_{it}$	-2.15413	-1.48231	-3.44532*	-3.56936**	-10.0143***	-10.0199***
δ_{xt}	-3.55668**	-2.79231	-4.32174***	-7.90158***	-14.072***	-59.454***
Critical						
	Constant only			Constant and Trend		
Values	1%	5%	10%	1%	5%	10%
ADF	-3.50648	-2.89472	-2.58453	-4.06204	-3.45995	-3.15611
PP	-3.50388	-2.89359	-2.58393	-4.06204	-3.45995	-3.15611

Note. ***, ** & * stand for 1%, 5% & 10% level of significance in that order, at which null hypothesis is rejected. Schwartz Information Criteria (SIC) were applied for Augmented Dickey-Fuller (ADF) with maximum lag length of 11, and Newey-West Bandwidth (using Bartlett Kernel) selection criteria was used in Phillips-Perron (PP).

4. Empirical Findings and Discussion

Table 2 shows the descriptive statistics of the variables and their correlations, while $\ln G_{it}$, O_{it} and $\ln F_{it}$ are positively correlated to $\ln T_{ijt}$ (China-Nigeria bilateral trade volume), X_{ijt} and δ_{xt} are negatively correlated.

As prerequisite to Johansen and Juselius technique of cointegration, the degree of integration of each variable need be defined. For this purpose, the researchers espouse Augmented Dickey-Fuller (ADF) and reasserted with Phillips-Perron (PP) technique. The outcome of which is posted in table 3. Table 3 reveals that not all variable are stationary at level $I(0)$ but all are integrated of order $I(1)$, hence suitable for implementation of adopted cointegration technique.

4.1 Lag Selection Criteria

Table 4 represents a VAR Lag order selection criteria. The importance of econometric lag determination cannot be overemphasised as it reduces biasness in lag selection. The outcome demonstrates that lag 2 is the preferred choice and most appropriate for the selected parameters with high support from LR, FPE, AIC, and HQ criteria.

Table 4. VAR lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-619.864	NA	0.119347	14.90153	15.07516	14.97133
1	-25.9289	1088.882	2.04E-07	1.617354	2.832763*	2.105938
2	39.60317	110.7804*	1.02e-7*	0.914210*	3.171397	1.821580*
3	68.56097	44.81565	1.25E-07	1.081882	4.380847	2.408038
4	85.70934	24.08937	2.08E-07	1.53073	5.871474	3.275673
5	115.8189	37.9954	2.67E-07	1.670979	7.053501	3.834707
6	146.3663	34.18398	3.60E-07	1.800803	8.225104	4.383318
7	170.3978	23.45934	6.16E-07	2.085767	9.551847	5.087068
8	212.3548	34.96417	7.73E-07	1.943933	10.45179	5.364021

* indicates lag order selected by the criterion, each test at 5% level.

4.2 Co-Integration Test

Empirically, table 5 reveals that at 5% level of significance, the value of Trace statistic and Max-Eigen statistic are greater than their respective critical values at $R=0$. Hence, one could clearly reject the null hypotheses of no cointegration vector against the specific alternative ones. This implies that a long-run equilibrium relationship exist between the variables.

Table 5. Johansen and Juselius cointegration test result

Hypothesized No of CE(s)	Cointegration Test 1			Cointegration Test 2		
	$R=0$	$R\leq 1$	$R\leq 2$	$R=0$	$R\leq 1$	$R\leq 2$
Eigenvalue	0.386679	0.299151	0.141578	0.386679	0.299151	0.141578
Trace Statistic	102.4533	58.94419	27.30804			
Max-Eigen Statistic				43.50908	31.63615	13.58669
Critical Value	95.75366	69.81889	47.85613	40.07757	33.87687	27.58434
Prob.**	0.016	0.2692	0.8424	0.0198	0.0904	0.8501

Note. R stands for No. of cointegrated vectors, * denoted rejection of null hypotheses at 0.5 level, ** is Mackinnon-Huang-Micheli (1999) P-value and critical value is derived from Ostrwal-Lenum.

4.3 Determining the Long-Run Coefficients

Having established the existence of co-integration relationship among the variables, it becomes paramount to determine the long-and-short runs coefficients to define the parameters. Table 6 shows the result of the long-run co-efficient determined by Johansen and Juselius Cointegration technique. We can deduce that real GDP positively influences China-Nigeria bilateral trade. In essence, growing Nigeria's GDP will impact positively, by encouraging this trade relation in the long-run. One may be quick to ask on which direction; import or export. Simply put, on both sides because growing GDP signifies increasing market size which attracts more importation and since no economy can be proved to grow as self-dependent. Moreover, increasing GDP indicates increasing production of which most will be exported. One can then imply that increase in GDP will produce an increase in trade generally. From the result displayed, a percentage rise in GDP will engender over 0.56% increase in the bilateral trade, all things being equal. This is consistent with the expectation that the co-efficient ought to be >0 and statistically significant.

Contrastingly, the case is different with real bilateral exchange rate (X_{ijt}), the expectation was that X_{ijt} will take a negative or positive co-efficient depending on the trade flow pattern between the two nations. The analysis revealed an obvious negative co-efficient; referring back to the graphical analysis in the introductory part of the paper, Nigeria has a deficit trade balance with China, and hence, it asserts much influence on the exchange which brought the envisaged result hitherto. Therefore, within the period under review, a one percent increase (depreciation) of naira against the Chinese yuan, will produce a reduction of trade by about 0.01%. Common economics knowledge has it that depreciation encourages export and discourages import, justifying the scenario here, since the amount of import from China to Nigeria surpasses the quantity of export from Nigeria to China.

Table 6. Long run coefficient determination

Independent Variables	$\ln G_{it}$	O_{it}	X_{ijt}	$\ln F_{it}$	δ_{jt}
Coefficients	0.56743	1.72811	-0.017075	1.04026	-0.01681
Standard error	-0.17389	-0.2558	-0.00407	-0.29621	-0.00399
T-statistics	3.263178	6.755704	-4.19533	3.511904	-4.21303

Note. Variable are significant when value of T-statistic is above /1.7/.

Degree of trade openness varies directly as China-Nigeria bilateral trade in the long-run. Not different from expectation, the result posted that a one percent increases in openness in the long-run will germinate little over 1.7% increase in China-Nigeria bilateral trade. Openness exerts much than all other variables, thereby posting a large number co-efficient in the long-run. The reason is not farfetched. The more open the economy is to trade, the more attraction both export and import will generate in the subsequent year, not only for China-Nigeria trade but in general Nigeria's trading sector. Inasmuch as trade is good and spurs economics development and growth, it should be approached with caution to avoid immiserising growth first proved by Bhagwati (1958), where growth will totally be anchored on trade rather than other factors that could stimulate economic increase with more stability.

FDI inflow has been theoretically proven to attract more trade either in the form of import or exports. FDI encourages import significantly, especially when heavy equipment, machineries and technology accompanies such inflows which prompt such purchases from outside the country especially in developing countries like Nigeria. Lately, many of these required technologies have been sourced from China and no doubt its reflection in the result. Also all the output of these FDI may not be wholly utilized by the domestic economy, therefore will prompt accelerated exportation; exporting to countries far and near. So, based on the analysis, FDI has a positive and significant relation to China-Nigeria trade. In other words, in a long-run situation, a percentage increase in FDI will generate more trade between Nigeria and China. Within the proximate time of this research, reasonable amount of Nigeria's import from china are in the form of technologies and machineries though a sensible percentage exists in processed goods.

One of the factors highlighted in this research which has been largely neglected in previous researches is the impact of third party economic activities which can affect bilateral trade, especially when the third party is a close competitor in the international market. Permit us to say that efficiency in production from such Third Country competitor will shift trade towards their direction. Though China's trade with Africa is well documented to be on the rise, the impact of Japan is still being very much felt. The outcome of this analysis would prompt one to draw the conclusion that Japan's Real Effective Exchange Rate (REER) is a significant variable that withheld the progress of China-Nigeria bilateral trade in the long-run, all other factors remain constant.

4.4 Determining the Short-Run Coefficients

The short-run results are consistent with the long-run outcomes except for δ_{jt} which reveals a positive sign against expectation, indicating that in the short-run a fall in Japan's real effective exchange rate will tend to have positive effect toward influencing China-Nigeria trade but as it converge to long-run equilibrium, the sign changes and real effect manifest which will drawback the positivity of China-Nigeria trade. Hence, one can assert that Japan's REER as a third country factor is more or less a long-run phenomenon. However, Openness and FDI are also not significant in the short-run but the coefficients turn out as expected.

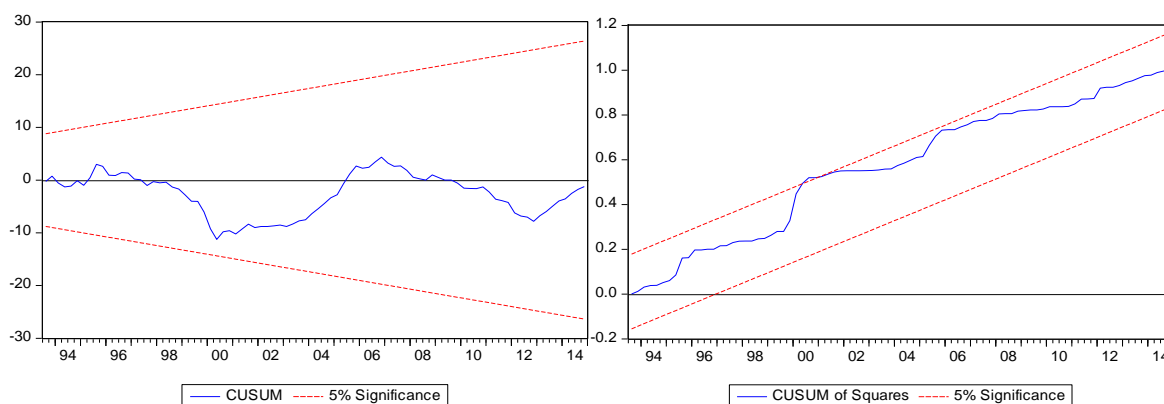
Table 7. Short-run coefficients via VECM

V	EC_{m-1}	$\Delta \ln G_{it}$	ΔO_{it}	ΔX_{ijt}	$\Delta \ln F_{it}$	$\Delta \delta_{jt}$	C
C	-0.72104	0.625388	0.149271	-0.014126	1.641722	0.017865	0.057378
S. E	(0.11754)	(0.2718)	(0.51925)	(0.00742)	(2.03997)	(0.00599)	(0.04805)
T-stat	[-6.13449]	[2.30089]	[0.28747]	[-1.90276]	[0.80478]	[2.98333]	[1.19421]
Prob.	0.0000	0.0242	0.5837	0.0609	0.4235	0.0159	0.2362

Note. V represents independent variables, C the coefficient, S.E the standard error.

4.5 Stability Test

Stability test is very crucial to ascertain the fitness and stability of the model as its instability will be detrimental and unreliable. Thus, the research will base on CUSUM and CUSUM square to test the model's stability, as developed by Brown et al. (1975). The assumption being that the line of the plotted cumulative sum of recursive residuals must be within the boundaries.



The CUSUM and CUSUM square test graphs at 5% significance, plotted to check the stability and fitness of the calculated parameters as used in the model indicates perfect stability, and annuls any specification errors. Other diagnostics test results are found in Table 8.

Table 8. Diagnostics

R-squared	0.554218
Adj. R-squared	0.476949
JB	4.355003
LM	0.317168

Note. JB is Jarque-Bera normality test, LM is the Breusch-Godfrey LM test for autocorrelation.

5 Conclusions

This research analysed the trend of trade between Nigeria and China, advanced progressively to determine the economic determinants of this bilateral trade with reference to Nigeria economic factors, while also considering the effect of a third country efficiency factor. By and large, Japan's REER was adopted as a third country's factor due to the fact that it captures domestic price competitiveness in relation to bilateral trade. The long-run results were consistent with expectation and most academic conclusions, likewise, the short-run result except for Japan's REER which seems to be long-run phenomenon. GDP was a positive determinant both in short-and-long runs, so also were trade openness and FDI inflows. With Japan's REER adopted as the third country bilateral factor, the result proved a negative influence in the long run but short run were inconsistent as it indicates a positive relation. As it gradually converge to equilibrium in the long-run the sign changes to negative. Lastly, Nigeria-China bilateral exchange rate was another prominent factor that has negative and significant relation with China-Nigeria bilateral trade both in long-and-short runs and this could be attributed to excess gap between Nigeria's imports to China and the latter's exports to Nigeria.

Therefore, improving the business environment is crucial in attracting further FDI and diversifying the economy to ensure enhancement of Nigeria's traded sector. China will largely have its work cut short at improving trade with Nigeria in particular and the rest of Africa in general by not only improving prices, efficiency and competitiveness but also quality and watching closely economic development of major competitors in African market especially from the Southeast Asia region to curtail the excessiveness of the influence of the third country's effect. Nigeria would follow suit in this regards to advance improvement in this context within her economic territory and its relation to the rest of the world.

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