Foreign Trade and Economic Growth: A Study of Nigeria and India

Tajudeen Egbetunde[1], Tomola Marshall Obamuyi[2]

Abstract: The study examines the impact of foreign trade on economic growth in Nigeria and India as well as the direction of causality between foreign trade and economic growth in the countries. The study used Vector Autoregression method (VAR) and Granger causality test in estimating the data. The data used were sourced from United Nations Conference on Trade and Development (UNCTAD). Results of the VAR show that economic growth had positive and significant impact on foreign trade in Nigeria and India. The results further revealed that the direction of causality running from foreign trade to economic growth in Nigeria and India. The study concludes that foreign trade serves as a lubricant in further enhancing economic activities of the countries. Therefore, the government in the two countries should further open up their economies for international trade and put in place sound macroeconomic policies that will enable the countries to reap the benefit of foreign trade.

Keywords: Foreign trade; economic growth; causality; Nigeria and India

1. Introduction

Over the last one and half decades, trade between Nigeria and India is becoming strategically important as a result of the rise of Nigeria's export supply to India and India's imports demand from Nigeria (Ibrahim & Shehu, 2016). In 2014, Nigeria's export to India hits $14.98 billion, which represents 33 percent of its total exports, while import from India stood at $2.77 billion, representing 12.4 percent of its total imports. The total trade value recorded between Nigeria and India from 2000-2013 stood at $88,036.96 million. Out of this trade value, $71,795.00 million represents Nigeria's exports to India and $16,241.96 million represents Nigeria's imports from India, which implies that the balance of trade in absolute term if not in real term is in favour of Nigeria (Kabiru & Dilfraz, 2014). Just recently 2014-2015 Nigeria-India

---

[1] Lecturer I, Department of Economics, Federal University of Technology, Akure, Nigeria, Address: The Federal University of Technology Akure, P.M.B. 704, Akure, Ondo State, Corresponding author: tegbetunde@futa.edu.ng.

[2] Department of Economics, Federal University of Technology, Akure, Nigeria, Address: The Federal University of Technology Akure, P.M.B. 704, Akure, Ondo State, E-mail: egbetunde@futa.edu.ng.

bilateral trade hits $16.36 billion, which was 2 percent less than the previous year 2013-2014 figure of $16.98billion (Indian High Commission in Nigeria, 2016).

Economists have long shown interest in identifying factors which cause different countries to grow at different rates over time. One of such factors is foreign trade. In the 19th century, Alfred Marshall declared that *the causes which determine the economic progress of nations belong to the study of international trade* (Marshall, 1959). Robertson (1938) famously described exports as an *engine* of growth while Minford, Riley and Nowell (1995) hailed foreign trade as an *elixir* of growth. This subject has continued to elicit responses from trade and growth theorists (see Obiora, 2009; Omoke & Ugwuanyi, 2010; Iyoha & Adamu, 2011; Obadan & Okojie, 2010; and Safdari, Mehrizi & Delqua-Niri, 2012).

In the light of the foregoing, this study investigates the impact of foreign trade on economic growth in Nigeria and India. The study also determines the direction of causality between foreign trade and economic growth in Nigeria and India. The study covers the period 1980 to 2015. The study is further organized as follows: section 2 discusses the literature review; section 3 presents the methodology employed while section 4 presents the empirical results and discussion; and section 5 concludes the study.

2. Literature Review

The relationship between trade openness and economic growth has been theoretically controversial. While conventional wisdom predicts a growth-enhancing effect of trade, recent developments suggest that trade openness is not always beneficial to economic growth. Increased international trade can generate economic growth by facilitating the diffusion of knowledge and technology from the direct import of high-tech goods (Barro & Sala-i-Martin, 1997; Baldwin et al., 2005; Almeida & Fernandes, 2008). Trade facilitates integration with the sources of innovation and enhances gains from foreign direct investment. By increasing the size of the market, trade openness allows economies to better capture the potential benefits of increasing returns to scale and economies of specialization (Alesina et al., 2000; Bond et al., 2005). In their theoretical models, Grossman and Helpman (1991) show that trade openness improves the transfer of new technologies, facilitating technological progress and productivity improvement, and that these benefits depend on the degree of economic openness.

Zahonogo (2017) posits that the consensus on the nexus between foreign trade and economic growth rests on the assumption that trade creates economic incentives that boost productivity through two dynamics: in the short-run, trade reduces resource use misallocation; in the long run, it facilitates the transfer of technological development. Trade liberalization can also force governments to commit to reform

programs under the pressure of international competition, thus enhancing economic growth (Sachs & Warner, 1995; Rajan & Zingales, 2003). Mustafa, Rizov and Kernohan (2017) report that trade liberalisation policies play a significant role in achieving higher growth as well as human development. Trade liberalization in developing countries has therefore often been implemented with the expectation of growth stimulation.

However, endogenous growth models postulate that the contribution of trade to economic growth varies depending on whether the force of comparative advantage orientates the economy's resources toward activities that generate long-run growth or away from such activities[1]. Moreover, theories suggest that, due to technological or financial constraints, less-developed countries may lack the social capability required to adopt technologies developed in more advanced economies. Thus, the growth effect of trade may differ according to the level of economic development. Despite its potential positive effect on growth, some theoretical studies claim that trade openness may hamper growth. For Redding (1999), Young (1991), and Lucas (1988), opening up to trade might actually reduce long-run growth if an economy specializes in sectors with dynamic comparative disadvantage in terms of potential productivity growth or where technological innovations or learning by doing are largely exhausted. For such economies, selective protection may foster faster technological advances.

The empirical analyses are as inconclusive as the theoretical perspectives. Some studies have identified a positive association between trade openness and economic growth (Chang et al., 2009; Kim, 2011; Jouini, 2015), while others have found no association, or even a negative association (Musila & Yiheyis, 2015; Ulaşan, 2015). For instance, Egbetunde and Alley (2016) find that trade openness had positive impact on economic growth in sub-Saharan Africa; they also reveal that FDI played a positive role in the effect of trade openness on economic growth in the countries; and they contend that FDI enhances trade openness as a means to further developing economic activities in sub-Saharan Africa. The literature is inconclusive partly because different analysts use different proxies for liberalization or trade openness and rely on different methodologies. The evidence for growth enhancements through trade liberalization displays mixed effects because of problems with misspecification and the diversity among the liberalization indices used.

The benefits of trade openness are not automatic. Policies, such as measures aimed at fostering macroeconomic stability and a favourable investment climate, must accompany trade openness (New farmer & Sztajerowska, 2012). Kim and Lin (2009) found that trade openness contributes to long-run economic growth, with effects varying according to the level of economic development. Herzer (2013) found that the impact of trade openness is positive for developed countries and negative for

---

[1] See (Zahonogo, 2017).

developing ones. The effect of trade liberalization on growth depends on the liberalization level. An income threshold exists above which greater trade openness has beneficial effects on economic growth and below which increased trade has detrimental consequences (Agénor, 2004; Liang, 2006). Empirical studies have found a possible two-way causality in the trade–growth link, whereby countries that trade more may have higher income, while countries with higher income may be better able to afford the infrastructure conducive to trade, may have more resources with which to overcome the information search costs associated with trade, or may demand more traded goods (Kim & Lin, 2009). Zeren and Ari (2013) revealed positive bidirectional causal links between openness and economic growth for G7 countries.

The empirical results, like the theoretical analyses, are controversial. The evidence has indicated that excessive regulations restrict growth because resources are prevented from moving into the most productive sectors and to the most efficient firms within sectors (Bolaky & Freund, 2008) and that institutions can help explain the heterogeneity in the trade–growth relationship (Sindzingre, 2005). Silberberger and Königer (2016) find that both regulation and trade have a significant positive influence on growth, while the less developed countries do not seem to benefit from improved regulation.

Falvey et al. (2012) employed threshold regression techniques on crisis indicators to identify the relevant crisis values and the differential post-liberalization growth effects in crisis and non-crisis regimes. Their findings indicate that an economic crisis at the time of liberalization does affect post-liberalization growth, in a direction that depends on the nature of the crisis. An internal crisis implies lower growth and an external crisis higher growth relative to a non-crisis regime. Based on an augmented production function, Fosu (1990) argued that export increases improve economic growth in African countries, whereas Ulaşan (2015) used a dynamic panel data framework to conclude that trade openness measures are not robustly significantly associated with economic growth, implying that trade openness alone does not boost economic growth. Trejos and Barboza (2015) provide robust empirical evidence that trade openness is not the main engine of the Asian economic growth "miracle."

In the light of controversial debate that surround the relationship between foreign trade and economic growth both in the developed and developing countries among the scholars, this study provides empirical evidence on the nexus between the subject matter for effective policy making in Nigeria and India.

3. Methodology

This paper used secondary data (time series data) for Nigeria and India. Empirical investigation was carried out on the basis of the sample covering the period 1980 to 2015. Real Gross Domestic Product (RGDP) was used as an indicator of economic growth, foreign trade (FRT) was measured as the sum of exports and imports divided by GDP. Vector of control variables are foreign direct investment (FDI) expressed in percent of GDP and labour force. Data on these variables were sourced from United Nations Conference on Trade and Development (UNCTAD), 2016 for both countries.

In this study, the method of Vector Autoregressive Model (VAR[1]) was adopted to estimate the effects of foreign trade on economic growth in Nigeria and India. Sims (1986) demonstrated that VAR models are particularly powerful tools for investigating the inter-relationships among non-stationary time-series variables and for obtaining reliable forecasts. This study posits a 4-variable VAR model in which real gross domestic product, foreign trade, foreign direct investment and labour force are simultaneously interrelated. The study also carried out unit roots tests of all variables. Forecast variance decomposition and impulse response functions are applied to examine dynamic interrelationships between the variables in the VAR system. Thus, the VAR model specified is:

$$V_t = \alpha + \sum_{i=1}^{k} A_i V_{t-1} + \mu_t$$

Where

V_t = (GDP, FRT, FDI, LBR), the vector of real gross domestic product, foreign trade, foreign direct investment and labour force.

α = intercepts of autonomous variables

A_i = matrix of coefficients of all the variables in the model.

V_{t-1} = vector of the lagged variables.

μ_t = vector of the stochastic error terms.

---

[1] VARs have indeed made it possible for researchers to address both the relative importance and the dynamic effects of various shocks on macroeconomic variables (Arodoye & Iyoha, 2014).

4. Empirical Results and Discussion

We perform a unit root test on each variable in our model using the Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) tests for Nigeria and India. The table i below shows the result of the unit root tests for the variables.

Table i. Unit Root Results

	Nigeria		India		Order of Integration
	Augmented Dicky-Fuller		Augmented Dicky-Fuller		
Series	Level	First Diff.	Level	First Diff.	
GDP	-3.842**	-6.090***	-7.129***	-8.739***	I(0)
FRT	-3.010**	-3.886***	-4.130*	-6.203**	I(0)
FDI	-3.472***	-6.777***	-4.829**	-6.208***	I(0)
LBR	-5.691**	-9.270***	-3.073**	-4.849***	I(0)
	Philip-Perron		Philip-Perron		
GDP	-3.621**	-4.795***	-3.001**	-3.665***	I(0)
FRT	-4.829**	-8.224***	-4.901**	-6.856***	I(0)
FDI	-4.201*	-6.714**	-5.020**	-6.208***	I(0)
LBR	8.237**	-13.448***	-3.073**	-5.018***	I(0)

*, ** and *** indicate the level of significance at 10%, 5% and 1% respectively.

The results in Table i suggest that we reject the null hypothesis of unit root at levels for all the variables. This results show that the variables were stationary at level i.e. I(0). The results of the unit root tests suggest that there is need to examine the direction of causality between the foreign trade and economic growth in the countries because the variables are stationary at level. Therefore, the results of causality tests are presented in Table ii below.

Table ii. Pairwise Granger Causality Tests

Null Hypothesis	Obs	F-Statistic	Prob.
Nigeria			
NGRGDP does not Granger Cause NGRFDI	34	7.48962	0.0024
NGRFDI does not Granger Cause NGRGDP	34	7.29844	0.0027
NGRLABOR does not Granger Cause NGRFDI	34	0.28046	0.7575
NGRFDI does not Granger Cause NGRLABOR	34	1.51718	0.2362
NGRFRT does not Granger Cause NGRFDI	34	3.22989	0.0541
NGRFDI does not Granger Cause NGRFRT	34	1.24339	0.3033
NGRLABOR does not Granger Cause NGRGDP	34	4.65882	0.0176
NGRGDP does not Granger Cause NGRLABOR	34	0.27766	0.7595
NGRFRT does not Granger Cause NGRGDP	34	3.9358	0.0323
NGRGDP does not Granger Cause NGRFRT	34	2.02245	0.1506
NGRFRT does not Granger Cause NGRLABOR	34	0.71191	0.4991
NGRLABOR does not Granger Cause NGRFRT	34	2.52209	0.0978
India			
INDGDP does not Granger Cause INDFDI	34	8.65323	0.0011
INDFDI does not Granger Cause INDGDP	34	6.04621	0.0064
INDLABOR does not Granger Cause INDFDI	34	0.24772	0.7822

INDFDI does not Granger Cause INDLABOR	34	0.92081	0.4095
INDFTR does not Granger Cause INDFDI	34	2.73597	0.0816
INDFDI does not Granger Cause INDFTR	34	4.66094	0.0176
INDLABOR does not Granger Cause INDGDP	34	0.41547	0.6639
INDGDP does not Granger Cause INDLABOR	34	2.00001	0.1536
INDFRT does not Granger Cause INDGDP	34	4.44782	0.0207
INDGDP does not Granger Cause INDFRT	34	0.27209	0.7637
INDFRT does not Granger Cause INDLABOR	34	3.70224	0.048
INDLABOR does not Granger Cause INDFRT	34	0.05251	0.9489

Note: The first three letters – NGR and IND – in the acronym of the variables indicate Nigeria and India respectively.

The results in Table ii show that the direction of causality running from foreign trade to economic growth in Nigeria and India. This suggests that foreign trade promotes economic growth in the countries. Therefore, the government in the two countries should further opening up their economy for international trade and put in place sound macroeconomic policies that will enable the countries to reap the benefit of foreign trade. The results also reveal that foreign trade granger cause foreign direct investment (FDI) in Nigeria, while evidence of bi-directional causality between foreign trade and FDI was reported in the results for India. This indicates that foreign trade accomplished transfer of technology through investment in Nigeria; whereas foreign trade and FDI promote each other in India. The results further show that labour force granger cause foreign trade in Nigeria, while foreign trade granger cause labour force in India. The results in Table ii also reveal that labour force granger cause economic growth in Nigeria. The results also show evidence of bi-directional causality between economic growth and FDI in the two countries.

As stated in the estimation model, the results of VAR are presented in Appendixes 1 and 2 for Nigeria and India respectively. The results in Appendixes 1 and 2 show that economic growth had positive and significant impact on foreign trade in Nigeria and India. This indicates that foreign trade serves as a lubricant in further enhancing economic activities of the countries. Therefore, government in the countries should boost their production base in such a way that will take care of the economies and the rest of the world; doing this will improve the income generating, which in turn enhance economic progress of the countries.

4.1. Results of Forecast Error Variance Decompositions (FEVD)

To further examine the short run dynamic properties of the GDP, FDI, LABOR and FRT in Nigeria and India, we examined the forecast error variance decomposition. The forecast error variance decomposition for the four variables was obtained and is reported in Appendixes 3 and 4 for Nigeria and India respectively. By definition, the variance decomposition shows the proportion of forecast error variance for each variable that is attributable to its own innovation and to innovations in the other endogenous variables.

An examination of the variance decomposition of GDP in Appendixes 3(i) and 4(i) shows that the lion's share of the variation experienced by GDP is attributed to its own shock. The contribution of own shock is 84.99% and 64.45% (for Nigeria and India respectively) in the third period and falls to 52.59% and 6.28% (for Nigeria and India respectively) at the end of the 10-period horizon. The contribution of the other 3 variables is quite marginal except the case of FDI and FRT. The highest is by FRT in India, which contributes 85.97% in the tenth period. A similar pattern is displayed by FRT where own shocks also account for a disproportionate share of the total variation. The contribution of own shock is 41.07% and 91.04% (for Nigeria and India respectively) in the third period and falls to 23.18 % and 84.87% (for Nigeria and India respectively) in the tenth period. The contribution of the other 3 variables is marginal except the case of GDP in Nigeria accounting for 55.42% of the variation.

4.2. Impulse Response Function Analysis

The Impulse Response function simulates over time the effect of a one-time shock in one equation on itself and on other equations in the entire equation system; hence it is used to detect interaction among variables. Results of the impulse response functions (IRFs) are summarized in Figs i and ii for Nigeria and India respectively. Examination of the graphs for GDP, FDI, LABOR and FRT shows that their movement with respect to the identified shocks is consistent with the results of variance decomposition analysis.
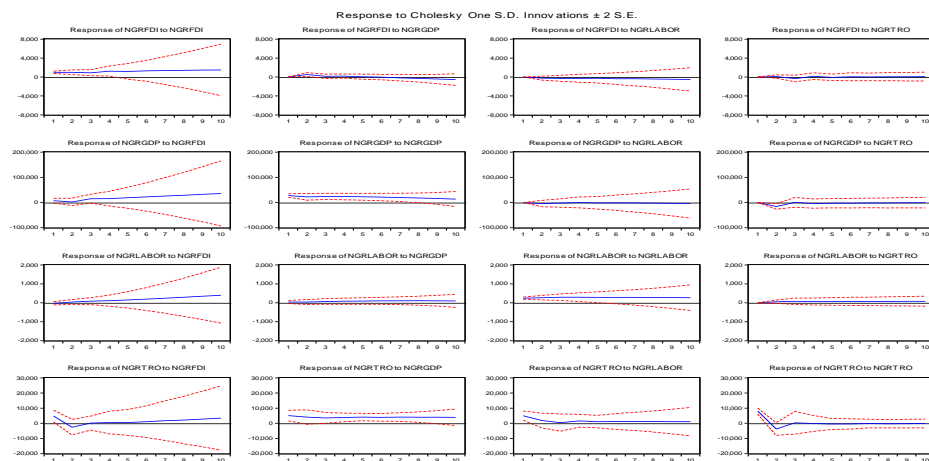
Figure i. Impulse Response Multiple Graph for Nigeria
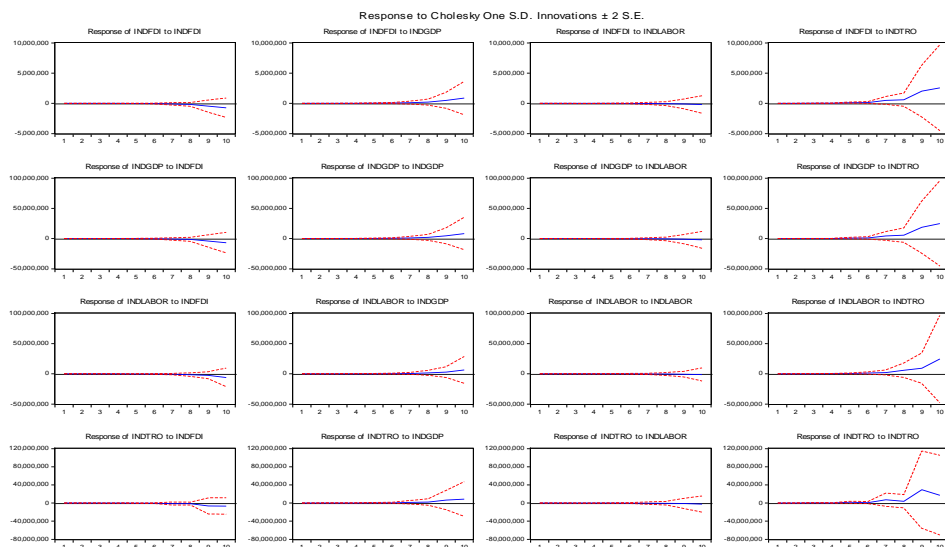
Figure Ii. Impulse Response Multiple Graph for India

Examination of the graphs for GDP, FDI, LABOR and FRT shows that their movement with respect to the identified shocks is consistent with the results of variance decomposition analysis.
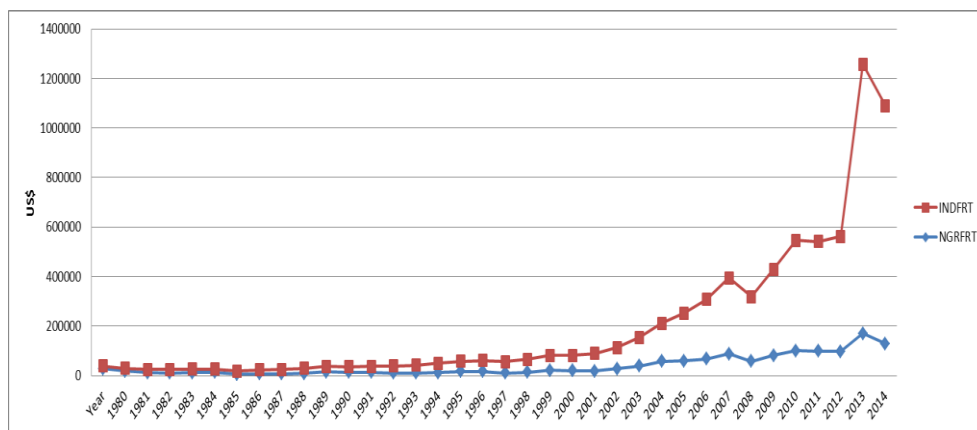
Figure iii. Trend of Foreign Trade in Nigeria (NGRFRT) and India (INDFRT)

Fig. iii above shows that Indian economy is more deeply involved in foreign trade than Nigerian economy. In recent time, the level of India's participation in international trade is very wide compare to the participation of Nigerian economy (see Fig. iii above).

5. Conclusion

The study investigated foreign trade – growth nexus in Nigeria and India as well as the direction of causality between foreign trade and economic growth in the economies. The study used Vector Autoregression (VAR) and Granger causality test in estimating the data. Results of the VAR show that economic growth had positive and significant impact on foreign trade in Nigeria and India. The results further revealed that the direction of causality running from foreign trade to economic growth in Nigeria and India. One of the recommendations of these results was that the government in the two countries should further opening up their economy for international trade and put in place sound macroeconomic policies that will enable the countries to reap the benefit of foreign trade. Secondly, government in the countries should boost their production base in such a way that will take care of the economies and the rest of the world; doing this will improve the income generating, which in turn enhance economic progress of the countries. Thirdly, government in the countries should also attract foreign direct investment in order to boost the participation in international trade and government should put in place appropriate mechanism that will guarantee the benefits and gains from FDI in the countries.

References

Agénor, P.R. (2004). Does globalization hurt the poor? *IEEP,* Vol. 1(1), pp. 21–51.

Alesina, A.; Spolaore, E. & Wacziarg, R. (2000). Economic integration and political disintegration. *American Economic Review*, Vol. 90(5), pp. 1276–1296.

Almeida, R. & Fernandes, A. (2008). Openness and technological innovations in developing countries: evidence from firm-level surveys. *Journal Development Study*, Vol. 44(5), pp. 701–727.

Arodoye, N.L. & Iyoha, M.A. (2014). Foreign trade – economic growth nexus: evidence from Nigeria. *CBN Journal of Applied Statistics*, Vol. 5, No.1, pp. 121-141.

Baldwin, R.E.; Braconier, H. & Forslid, R. (2005). Multinationals, endogenous growth, and technological spillovers: theory and evidence. *Review of International Economics*, Vol. 13(5), pp. 945–963.

Barro, R.J. & Sala-i-Martin, X. (1997). Technological diffusion, convergence, and growth. *Journal of Economic Growth*, Vol. 2(1), pp. 2–26.

Bolaky, B. & Freund, C. (2008). Trade, regulations, and income. *Journal Development Economics*, Vol. 87(2), pp. 309–321.

Bond, E.W.; Jones, R.W. & Ping, W. (2005). Economic take offs in a dynamic process of globalization. *Review of International Economics*, Vol. 13(1), pp. 1–19.

Chang, R.; Kaltani, L. & Loayza, N.V. (2009). Openness can be good for growth: the role of policy complementaries. *Journal Development Economics*, Vol. 90 (1), pp. 33–49.

Egbetunde, T. & Alley, I. (2016). Trade Openness and Economic Growth in Sub-Saharan Africa: A Dynamic Panel Data Analysis. *Ilorin Journal of Business and Social Sciences*, Vol. 18, No 1, pp. 153-169.

Falvey, R.; Foster, N. & Greenaway, D. (2012). Trade liberalization, economic crises, and growth. *World Development*, Vol. 40(11), pp. 2177–2193.

Fosu, A.K. (1990). Exports and economic growth: the African case. *World Development*, Vol. 18, pp. 831–835.

Grossman, G.M. & Helpman, E. (1991). *Innovation and Growth in the Global Economy*. MIT Press, Cambridge, MA.

Herzer, D. (2013). Cross-country heterogeneity and the trade-income relationship. *World Development*, Vol. 44, pp. 194–211.

Indian High Commission in Nigeria (2016). Nigeria-Fact-Sheet.php, Last visit on 13/06/2016. Available from www.hcindia-abuja.org/.

Iyoha, M.A. & Adamu, P.A. (2011). The impact of external trade on economic growth in Nigeria: A Roadmap for the Twenty-First Century. *West African Social and Management Sciences Review*, Vol. 2(1), pp. 1-30.

Jouini, J. (2015). Linkage between international trade and economic growth in GCC countries: empirical evidence from PMG estimation approach. *Journal of International Trade & Economic Development*, Vol. 24(3), pp. 341–372.

Kabiru, H.I. & Abdulaziz, S (2016). Nigeria-india bilateral trade relations: an analysis of trade complementarity index (TCI). *Asian Journal of Economic Modelling*, Vol. 4, No 4, pp. 190-198.

Kabiru, H.I. & Dilfraz, S. (2014). Changing perspective of Indo-Nigerian trade relations. *Indian Journal of Applied Research*, Vol. 4, No 7, pp 497-503.

Kim, D.H. (2011). Trade growth and income. *Journal of International Trade & Economic Development*, Vol. 20 (5), pp. 677–709.

Kim, D.H. & Lin, S.C. (2009). Trade and growth at different stages of economic development. *Journal of Development Studies*, Vol. 45(8), pp. 1211–1224.

Liang, Z. (2006). Threshold Estimation on the Globalization Poverty Nexus: Evidence from China. Research Paper. UNU-WIDER United Nations University, No.2006/57.

Lucas, R.E. (1988). On the mechanic of economic development. *Journal of Monetary Economics*, Vol. 46 (1), pp. 167–182.

Marshall, A. (1959). *Principles of economics*. 8th Edition, Macmillan for the Royal Economic Society.

Minford, P.; Riley, J. & Nowell, E. (1995). The elixir of growth: trade, non-traded goods and development. *Centre for Economic Policy Research*, Discussion Paper No. 1165.

Musila, J.W. & Yiheyis, Z. (2015). The impact of trade openness on growth: the case of Kenya. *Journal of Policy Model*, Vol. 37, pp. 342–354.

Mustafa, G.; Rizov, M. & Kernohan, D. (2017). Growth, human development and trade: The Asian experience. *Economic Modelling*, Vol. 61 (2017), pp. 93–101.

Newfarmer, R. & Sztajerowska, M. (2012). Trade and Employment in fast Changing World. *In: Lippoldt, Douglas (Ed.), Policy Priorities for International Trade and Jobs*. OECD, Paris, pp. 7–73.

Obadan, M.I. & Okojie, E.I. (2010). An empirical analysis of the impact of trade on economic growth in Nigeria. *Jos Journal of Economics*, Vol. 4(1).

Obiora, K.I. (2009). How much do trading partners matter for Nigeria's growth? A Contribution to the Debate on Decoupling and Spillovers. *Journal of Economic and Monetary Integration*, Vol. 9(1).

Omoke, P.C. & Ugwuanyi, C.U. (2010). Export, domestic demand and economic growth in Nigeria: granger causality analysis. *European Journal of Social Sciences*, Vol. 13(2).

Rajan, R.G. & Zingales, L. (2003). The great reversals: the politics of financial development in the twentieth century. *Journal Financial Economics*, Vol. 69(1), pp. 5–50.

Redding, S. (1999). Dynamic comparative advantage and the welfare effects of trade. *Oxford Economic Paper*, Vol. 51(1), pp. 15–39.

Robertson, D.H. (1938). The future of international trade. *Economic Journal*, Vol. 48 (189).

Sachs, J.D. & Warner, A. (1995). Economic reform and the process of global integration. *Brook. Paper of Economics & Accounting*, Vol. 1, pp. 1–118.

Safdari, M.; Mehrizi, M.A. & Dehqan-Niri, M.R. (2012). The relationship between foreign trade and economic growth in Iran. *American Journal of Scientific Research*.

Silberberger, M. & Königer, J. (2016). Regulation, trade and economic growth. *Economic Systems*, Vol. 40, pp. 308–322.

Sims, C.A. (1986). Are Forecasting Models Usable for Policy Analysis? *Federal Reserve Bank of Minneapolis Quarterly Review*, Vol. 10 (Winter 1986), pp. 2–16.

Sindzingre, A. (2005). Explaining Threshold Effects of Globalization on Poverty: an Institutional Perspective. Research Paper. UNU-WIDER United Nations University (No.2005/53).

Trejos, S. & Barboza, B. (2015). Dynamic estimation of the relationship between trade openness and output growth in Asia. *Journal of Asian Economics*, Vol. 36, pp. 110–125.

Ulaşan, B. (2015). Trade openness and economic growth: panel evidence. *Applied Economic Letter*, Vol. 22 (2), pp. 163–167.

Young, A. (1991). Learning by doing and the dynamic effects of international trade. *Quarterly Journal of Economics*, Vol. 106 (2), pp. 369–405.

Zahonogo, P. (2017). Trade and economic growth in developing countries: Evidence from sub-Saharan Africa. *Journal of African Trade*, forthcoming.

Zeren, F. & Ari, A. (2013). Trade openness and economic growth: a panel causality test. *International Journal of Business & Social Sciences*, Vol. 4, pp. 317–324.

Appendix 1. Vector Autoregression Estimates for Nigeria

	NGRGDP	NGRFDI	NGRLABOR	NGRFRT
NGRGDP(-1)	1.135053	0.018068	-0.001201	0.206216
	(0.22545)	(0.00776)	(0.00193)	(0.09285)
	[5.03453]	[2.32910]	[-0.62304]	[2.22093]
NGRGDP(-2)	-0.060202	-0.025161	-0.000430	0.025737
	(0.26547)	(0.00913)	(0.00227)	(0.10933)
	[-0.22678]	[-2.75455]	[-0.18961]	[0.23540]
NGRFDI(-1)	3.919506	0.775816	0.036944	-1.431328
	(5.46844)	(0.18816)	(0.04675)	(2.25212)
	[0.71675]	[4.12314]	[0.79022]	[-0.63555]
NGRFDI(-2)	-2.979160	0.390145	0.019924	-1.871716
	(6.48389)	(0.22310)	(0.05543)	(2.67033)
	[-0.45947]	[1.74873]	[0.35943]	[-0.70093]
NGRFRT(-1)	-1.966455	0.012045	0.006739	-0.457912
	(0.62114)	(0.02137)	(0.00531)	(0.25581)
	[-3.16587]	[0.56356]	[1.26912]	[-1.79004]
C	-124961.3	3124.940	708.3829	-102001.4
	(67752.6)	(2331.27)	(579.233)	(27903.2)
	[-1.84438]	[1.34044]	[1.22297]	[-3.65554]
R-squared	0.974659	0.893386	0.999530	0.938246
Adj. R-squared	0.966550	0.859270	0.999379	0.918485
F-statistic	120.1937	26.18645	6639.146	47.47921

Standard errors in ( ) & t-statistics in [ ]

Appendix 2. Vector Autoregression Estimates for India

	INDGDP	INDFDI	INDLABOR	INDFRT
INDGDP(-1)	1.363026	0.076360	-0.082211	0.649139
	(0.21484)	(0.01496)	(0.15027)	(0.26647)
	[6.34438]	[5.10342]	[-0.54708]	[2.43608]
INDGDP(-2)	-0.930309	-0.143885	-0.242925	-1.435415
	(0.47095)	(0.03280)	(0.32941)	(0.58413)
	[-1.97538]	[-4.38682]	[-0.73745]	[-2.45737]
INDFDI(-1)	-0.214148	0.605225	-0.718576	-1.158208
	(2.20187)	(0.15335)	(1.54012)	(2.73101)
	[-0.09726]	[3.94671]	[-0.46657]	[-0.42409]
INDFDI(-2)	4.603658	-0.349744	0.638719	-11.04934
	(2.77271)	(0.19311)	(1.93940)	(3.43903)
	[1.66035]	[-1.81116]	[0.32934]	[-3.21293]
INDFRT(-2)	2.084910	0.306068	0.546276	5.440161
	(1.29942)	(0.09050)	(0.90890)	(1.61169)
	[1.60449]	[3.38204]	[0.60103]	[3.37544]
C	180101.4	14849.60	99049.40	125749.0
	(76441.2)	(5323.75)	(53467.7)	(94811.1)
	[2.35608]	[2.78931]	[1.85251]	[1.32631]
R-squared	0.992459	0.934851	0.855544	0.931153
Adj. R-squared	0.990046	0.914003	0.809318	0.909122
F-statistic	411.2956	44.84179	18.50788	42.26571

Appendix 3. Variance Decomposition (Nigeria) of NGRGDP, NGRFDI, NGRLABOR, NGRFRT

FEVD (i) - Variance Decomposition of NGRGDP

Period	S.E.	NGRGDP	NGRFDI	NGRLABOR	NGRFRT
1	28742.77	100.0000	0.000000	0.000000	0.000000
2	40125.07	82.18692	0.835030	1.190019	15.78803
3	49115.24	84.99841	3.465571	0.988658	10.54736
4	56735.73	85.75332	4.992952	0.743275	8.510454
5	64017.70	84.87368	7.605423	0.637000	6.883898
6	71010.98	82.43608	11.28197	0.547009	5.734938
7	78115.92	79.03993	15.65881	0.505844	4.795419
8	85210.57	74.80969	20.60349	0.506268	4.080548
9	92597.71	69.85865	26.12314	0.548026	3.470189
10	100253.5	64.45088	31.95474	0.627121	2.967264

FEVD (ii) - Variance Decomposition of NGRFDI

Period	S.E.	NGRGDP	NGRFDI	NGRLABOR	NGRFRT
1	989.0001	6.423519	93.57648	0.000000	0.000000
2	1511.837	27.03494	69.93516	2.612654	0.417241
3	1819.138	22.85705	69.17241	4.390377	3.580166
4	2234.754	20.07965	72.38477	4.624774	2.910800
5	2544.973	17.34771	75.58691	4.724123	2.341259
6	2881.862	14.57086	78.35484	5.222603	1.851690
7	3209.398	12.05004	80.92373	5.530015	1.496223
8	3545.298	9.932575	82.86539	5.947145	1.254885
9	3883.306	8.290911	84.26752	6.375259	1.066308
10	4230.448	7.136063	85.08735	6.837624	0.938965

FEVD (iii) - Variance Decomposition of NGRLABOR

Period	S.E.	NGRGDP	NGRFDI	NGRLABOR	NGRFRT
1	245.7287	1.890869	1.977335	96.13180	0.000000
2	370.8608	2.563335	1.309901	93.95600	2.170767
3	491.4880	4.543130	2.496680	89.09956	3.860632
4	591.0250	6.436426	3.792417	85.92888	3.842276
5	684.7563	8.261293	6.075223	81.76249	3.900990
6	778.1877	9.999482	9.106824	77.01852	3.875174
7	872.2606	11.52358	12.80993	71.89843	3.768052
8	969.8619	12.72741	17.21266	66.42097	3.638955
9	1072.831	13.56158	22.20758	60.73551	3.495329
10	1182.441	13.99117	27.67044	54.99733	3.341058

FEVD (iv) - Variance Decomposition of NGRFRT

Period	S.E.	NGRGDP	NGRFDI	NGRLABOR	NGRFRT
1	11837.43	26.95003	8.103606	18.03513	46.91123
2	13447.51	27.04590	13.09038	15.89142	43.97230
3	13923.72	31.51387	12.48316	14.92301	41.07996
4	14547.61	35.92772	11.55035	14.88411	37.63782
5	15173.99	40.36581	10.73453	14.21497	34.68469
6	15766.22	44.15894	9.944915	13.69753	32.19862

7	16426.12	47.87151	9.308963	13.14492	29.67461
8	17099.94	50.99754	8.989048	12.59367	27.41975
9	17825.53	53.57191	9.207503	11.97697	25.24361
10	18603.54	55.42976	10.05286	11.33267	23.18471

Appendix 4. Variance Decomposition (India) of INDGDP, INDFDI, INDLABOR, INDFRT

FEVD (i) - Variance Decomposition of INDGDP

Period	S.E.	INDGDP	INDFDI	INDLABOR	INDFRT
1	62608.11	100.0000	0.000000	0.000000	0.000000
2	103139.2	98.58177	0.000562	0.659419	0.758252
3	194681.2	52.59872	0.538198	1.600160	45.26292
4	283324.0	51.56205	1.671416	4.553515	42.21302
5	963600.2	13.51455	1.191920	1.413601	83.87993
6	1554753.	13.81161	2.126080	1.931806	82.13050
7	4761756.	6.102134	3.815199	0.606259	89.47641
8	7736626.	7.517017	5.589417	0.801557	86.09201
9	21325640	4.775029	5.619833	0.320545	89.28459
10	34626986	6.288677	7.260322	0.476098	85.97490

FEVD (ii) - Variance Decomposition of INDFDI

Period	S.E.	INDGDP	INDFDI	INDLABOR	INDFRT
1	4360.340	1.854177	98.14582	0.000000	0.000000
2	7245.487	46.74586	49.76792	3.455766	0.030451
3	22770.26	14.36180	5.150645	1.556057	78.93150
4	34282.14	14.86104	2.439344	2.815864	79.88376
5	117168.3	5.857076	3.066246	0.734224	90.34245
6	184923.7	7.606136	4.928865	1.003960	86.46104
7	538282.7	4.527333	5.302492	0.341446	89.82873
8	846184.8	6.263886	7.160270	0.524023	86.05182
9	2303190.	4.357452	6.276907	0.225983	89.13966
10	3638161.	6.058719	7.921961	0.393447	85.62587

FEVD (iii) - Variance Decomposition of INDLABOR

Period	S.E.	INDGDP	INDFDI	INDLABOR	INDFRT
1	43791.98	1.722556	0.667732	97.60971	0.000000
2	74325.15	4.647025	1.479449	52.68992	41.18361
3	116051.8	7.139435	1.447052	24.18341	67.23010
4	327673.2	5.330365	3.005696	3.036875	88.62706
5	606997.9	6.359550	4.725068	1.059068	87.85631
6	1573083.	4.738166	5.421255	0.324837	89.51574
7	2831415.	5.679611	6.815337	0.376867	87.12819
8	6857159.	4.657628	6.556286	0.237682	88.54840
9	12223803	5.616645	7.614612	0.326494	86.44225
10	28864518	4.726031	6.943409	0.222144	88.10842

FEVD (iv) - Variance Decomposition of INDFRT

Period	S.E.	INDGDP	INDFDI	INDLABOR	INDFRT
1	77653.71	10.09991	0.224651	0.118048	89.55739
2	88617.39	28.67478	0.419263	1.672663	69.23329
3	408305.2	5.739222	2.942077	0.274959	91.04374
4	446854.3	10.66722	3.668162	1.247330	84.41728
5	1808443.	3.949673	4.202851	0.216374	91.63110
6	2055121.	7.557705	6.206855	0.797496	85.43794
7	7702719.	3.509540	5.084719	0.154943	91.25080
8	8964272.	6.726027	7.514293	0.584430	85.17525
9	32094308	3.463921	5.514316	0.129422	90.89234
10	38083503	6.565559	8.057250	0.503416	84.87378