

# DIGITALES ARCHIV

ZBW – Leibniz-Informationszentrum Wirtschaft  
ZBW – Leibniz Information Centre for Economics

Adesoye, Bolaji Adesola

## Article

# Macroeconomic effects of export demand in Nigeria

**Provided in Cooperation with:**  
Danubius University of Galati

*Reference:* Adesoye, Bolaji Adesola (2017). Macroeconomic effects of export demand in Nigeria.

This Version is available at:  
<http://hdl.handle.net/11159/733>

## Kontakt/Contact

ZBW – Leibniz-Informationszentrum Wirtschaft/Leibniz Information Centre for Economics  
Düsternbrooker Weg 120  
24105 Kiel (Germany)  
E-Mail: [rights\[at\]zbw.eu](mailto:rights[at]zbw.eu)  
<https://www.zbw.eu/econis-archiv/>

## Standard-Nutzungsbedingungen:

Dieses Dokument darf zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden. Sie dürfen dieses Dokument nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, aufführen, vertreiben oder anderweitig nutzen. Sofern für das Dokument eine Open-Content-Lizenz verwendet wurde, so gelten abweichend von diesen Nutzungsbedingungen die in der Lizenz gewährten Nutzungsrechte.

<https://zbw.eu/econis-archiv/termsfuse>

## Terms of use:

*This document may be saved and copied for your personal and scholarly purposes. You are not to copy it for public or commercial purposes, to exhibit the document in public, to perform, distribute or otherwise use the document in public. If the document is made available under a Creative Commons Licence you may exercise further usage rights as specified in the licence.*

## Macroeconomic Effects of Export Demand in Nigeria

**Bolaji Adesola Adesoye<sup>1</sup>**

**Abstract:** This study examines the macroeconomic effects of aggregate export demand in Nigeria using annual time series data between 1970 and 2013. The paper made use of the ordinary least square method to analyse the long-run relationship for the period under study. The empirical results confirm that there exists a unique and significant long-run equilibrium relationship among export volume, world income, crude oil price, domestic output, exchange rate and cost of doing business. The estimated results show that domestic income has the highest elasticity, followed by world's output and cost of doing business, which all report positive relations. Other macroeconomic factors reported negative relationship with aggregate export volume. Thus, an important policy implication of our findings is that stabilizing Nigeria's export earnings potential by counteracting the external factors that influence adversely the Nigerian exports such as crude oil price and cost of doing business.

**Keywords:** Export demand; domestic output; world outputs; inflation rate; Nigeria

**JEL Classification:** E00

### 1. Introduction

Over the past decades, the developmental role of export had been appreciated from the fact that it earns foreign exchange, increases firms' sales/profit, lowers production cost, creates employment, earns international recognition, enhances reputation, and improves the living standard of both the exporting and importing firms/nations. Exports have long played a role in the analysis of regional economies, primarily through the concept of the economic base. The need to export is predicated solely on economic reasons. Export promotion highlights on two most important concepts. Firstly, export in the context of regional economic development is seen as goods and services sold outside the region, not necessary international. Secondly, export may refer to goods and services sold to people in countries other than the country where the product or service is produced.

Most countries control the movement of goods crossing their borders, whether leaving (exports) or entering (imports). Some of the basic export and import documents are tariffs, quotas, etc. They are barriers to the free flow of goods between independent sovereignties and are requirements that must be met by either the exporter or the importer or both. In other to ensure good trading relationship between countries and easy movement of goods, services and human capital, trade barriers are reduced or removed (Aimiumu, 2004).

Nigeria has achieved some appreciable output growth in recent times. A number of explanations of this observed trend have been attempted in different academic papers. Non-oil exports performance has also

<sup>1</sup> Department of Economics, University of Ibadan, Nigeria, E-mail: boladesoye@yahoo.com.

improved moderately during this period. Several factors appear to have contributed to this phenomenon including a rapid improvement in trade liberalization through improved exportation, concerted efforts to diversify the productive base of the economy, and a substantial increase in foreign direct investment inflows into the country.

However, it is noteworthy that despite the policy thrust on export promotions, there has not been any satisfactory result from previous attempt to assess its contribution to Nigeria's export performance - a major channel through which export demand is determined. Hence, this study examines the impact of macroeconomic effects of export growth in Nigeria. The importance of this study is that it shows the effect of both internal and external factors on export demand and openness of trade beyond borders. Furthermore, the relationship between variable determinants and export demand in developing countries has been of continuing interest both in theoretical and empirical literature.

## **2. Literature Review**

Export demand refers to the demand by foreign countries for goods and services produced domestically. Ultimately, these goods are exported to foreign residents. The theory of international trade and commercial policy is one of the oldest branches of economic thought. Exporting is a major component of international trade, and the macroeconomic risks and benefits of exporting are regularly discussed and disputed by economists and others. Two views concerning international trade present different perspectives. The first recognizes the benefits of international trade. The second concerns itself with the possibility that certain domestic industries (or laborers, or culture) could be harmed by foreign competition.

A lot of study has been carried for country-specific, cross-country and panel study. Senhadji and Montenegro (1999) estimates export demand elasticities for a large number of developing and industrial countries using time series techniques for 75 developing countries for a period of 1960 to 1993. Empirical findings revealed that the price and income elasticity estimates have good statistical properties. More so, the average long-run price and income elasticities are found to be approximately – 1 and 1.5, respectively. Thus, exports do react to both the trade partners' income and to relative prices. Indeed, Africa faces the lowest income elasticities for its exports, while Asia has both the highest income and price elasticities.

Osman and Evans (2005) examine the short-run and long-run elasticities of the Somalian exports for banana and livestock products in Somalia. They employed Co-integration and error correction within 1967 to 1987. The results obtained provide evidence of a long-run equilibrium relationship between the Somalian exports and its major determinants. The error correction predicts the adjustment of the variables to their long-run equilibrium value reasonably well, but there is a substantial variation in the adjustment speed across commodities.

Zheng and Sayed (2012) identify the main factor influencing U.S. pistachio export demand in North America for 1989 to 2009 using descriptive and simple linear regression. Findings indicate that Canadian GDP, U.S walnut export prices, and food safety concerns explain the majority of the pistachio import demand variation in Canada, whereas Iranian pistachio export prices, the real exchange rate

between the Mexican peso and the U.S. dollar, and U.S. pecan export prices explain the majority of the Mexican pistachio import demand variation.

Husein (2008) empirically estimates the critical parameters of the aggregate export demand function for Jordan within 1970 to 2004 using Johansen-Juselius and Saikkonen-Lütkepohl multivariate cointegration. The empirical results confirm that there exists a unique and significant long-run equilibrium relationship among exports, foreign income, relative export price, and domestic output. Our estimation results show that income elasticity is much larger than unity while export price elasticity is slightly above one. The long-run estimate of the export price elasticity reveal that the Marshall-Lerner condition is satisfied for Jordan and currency devaluation may be effective in improving Jordanian exports and her trade balance. Moreover, domestic output has a positive and significant impact on Jordanian exports.

Hamori and Matsubayashi (2009) use panel data to empirically analyze the stability of the export functions of Less Developing Countries within 1980 to 2004 by employing cointegration estimation. They find that the use of panel data for the region of the LDC clearly supports a cointegrating relationship. Their empirical results also show that price elasticity ranges between -0.24 and -0.34 and income elasticity ranges between 1.36 and 1.79 for the panel of LDCs.

Nanang (2010) analyzed the factors that affect the export demand for Ghana's timber products using cointegration and ECM techniques for a period of 1961 to 2006. They find that exchange rates and income were significant determinants of exported timber products and had the theoretically expected positive signs. The three policy initiatives significantly reduced the exports of sawnwood, but increased the exports of plywood and veneer. Price was moderately elastic for sawnwood and plywood and had the expected negative signs in both cases, while it was positive and inelastic for veneer. The error-correction coefficients show that 68% of shocks to veneer exported is corrected in the following year, while only approximately 20% and 19% of this are corrected for sawnwood and plywood, respectively. Sawnwood and plywood face stiff competition in the international market and this has revenue and tax policy implications for Ghana's forestry sector.

Hossain (2009) investigates the aggregate export demand behaviour in Indonesia for a period of 1963 to 2005 using Pesaran bounds testing and the Johansen cointegration tests, and long-run estimate. Pesaran bounds testing and the Johansen cointegration tests results suggest that there exists a long-run relationship between real exports, world income and the relative export prices in Indonesia. The long-run income elasticity of the demand for Indonesia's exports is significantly greater than one and the long-run relative export price elasticity of the demand for its exports is significantly lower than one. The recursive and rolling regressions and the Hansen-Johansen stability test results suggest that the export demand function for Indonesia has undergone a significant structural change since the late-1990s, which is reflected in the decrease of the income elasticity, and an increase in the relative export price elasticity, of demand for Indonesian exports.

Timmer and Vries (2015) analyze the impact of foreign demand on Chinese employment creation from 1995 to 2012 using Global input-output methodology. They find that between 1995 and 2001, fast growth in foreign demand was offset by strong increases in labour productivity and the net effect on employment was nil. Between 2001 and 2006, booming foreign demand added about 70 million jobs.

These jobs were overriding for workers with only primary education. Since 2006 growth in domestic demand for non-tradables has become more important for job creation than foreign demand, signalling a rebalancing of the Chinese economy.

Dike (2013) determines the external crude oil demand security risks of OPEC member states using a panel estimation technique. In assessing these risks, this study introduces two indexes. The first index, Risky Energy Exports Demand (REED), indicates the level of energy export demand security risks for OPEC members. It combines measures of export dependence, economic dependence, monopsony risk and transportation risk. The second index, Contribution to OPEC Risk Exposure (CORE), indicates the individual contribution of the OPEC members to OPEC's risk exposure. His study utilises the disaggregated index approach in measuring energy demand security risks for crude oil and natural gas and involves a country level analysis.

Woerter and Roper (2010) reconsider the role of 'home' and 'export' market demand in stimulating manufacturing innovation using comparable panel data for two small open economies – Ireland and Switzerland. They employed panel techniques using a data set of 1994 to 2005. They find little evidence of any significant market demand effects, with innovation performance instead determined largely by firm-level capability effects and characteristics. In policy and strategy terms, they suggest the continued value of measures to improve innovation capability regardless of market demand conditions. In more methodological terms their results suggest the validity of the usual assumption implicit in modelling innovation outputs that supply-side factors predominate.

Nadeesha and Silva (2013) evaluate the development of Sri Lankan exports over the recent past and try to highlight a relationship between exports and shipping services for Sri-Lanka within 1987-2011, using descriptive, regression (OLS) and VAR analysis. Findings show that there is strong straight line relationship between the value of exports and the amount of cargo loaded. The VAR techniques reports that the derived demand for shipping by exports can be forecasted by using export performance data over a period of time.

Senhadji and Montenegro (1998) estimates export demand elasticities for a large number of 73 developing and industrial countries using time series techniques for a period of 1960 to 1993. Empirical findings revealed that the price and income elasticity estimates have good statistical properties. More so, the average long-run price and income elasticities are found to be approximately  $-1$  and  $1.5$ , respectively. Thus, exports do react to both the trade partners' income and to relative prices. Indeed, Africa faces the lowest income elasticities for its exports, while Asia has both the highest income and price elasticities.

### **3. Methodology**

To estimate the rest of the world's demand for Nigerian exports, the traditional long-run specification of export demand function that relates the volume of a country's exports to world buying power (foreign income) and the ratio of the price of its exports to the world export price will be included. Furthermore, following Guisan and Cancelo (2002), domestic GDP proxied by the industrial production index will be

included to capture supply side effects on host country's exports. The aggregate export demand function is specified as follows:

$$\ln X_t^d = \delta_0 + \delta_1 \ln YW_t + \delta_2 \ln \left( \frac{PX_t}{PXW_t} \right) + \delta_3 \ln YD_t + u_t \quad (3.1)$$

Where;  $X_t^d$  is the volume of country's export,  $YW$  is the rest of the world income,  $PX$  is home country's export price,  $PXW$  is world export price,  $YD$  is domestic GDP and  $u_t$  is a serially uncorrelated random term all at time  $t$ , and  $\ln$  stands for the natural logarithm of the relevant variables.

For the purpose of this study, the relative price of country export price to world price is replaced by oil price since Nigeria is an oil-export dependent country. More so, exchange rate and cost of doing business i.e. inflation rate is added as a control variable in the model adopted. It is thus specified as:

$$\ln X_t^d = \delta_0 + \delta_1 \ln YW_t + \delta_2 \ln OP_t + \delta_3 \ln YD_t + \delta_4 EXR_t + \delta_5 CDB_t + u_t \quad (3.2)$$

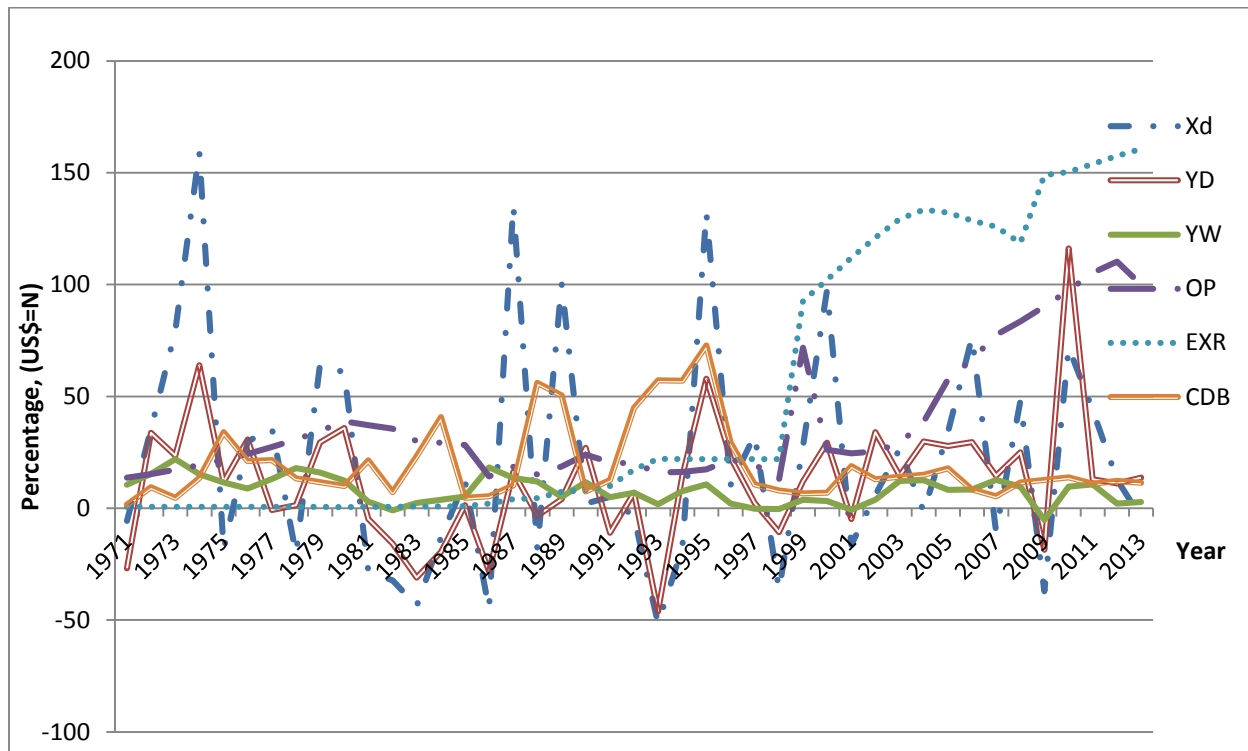
Where;  $X_t^d$  is the volume of country's export,  $YW$  is the rest of the world income,  $OP$  is crude oil price,  $YD$  is domestic GDP,  $EXR$  is exchange rate;  $CDB$  is cost of doing business proxy by inflation rate and  $u_t$  is a serially uncorrelated random term all at time  $t$ , and  $\ln$  stands for the natural logarithm of the relevant variables.

The study expect  $\delta_1$  to be positive, an indication that as world income rises, their demand for goods and services increases, including those of Nigeria,  $\delta_2$  to be positive reflecting the fact that as price of crude oil increases, Nigerian export earnings would also increase. Moreover, we expect  $\delta_3$  to be positive, an indication that strong economic performance measured by higher GDP will directly lead to higher exports. It is worthy to note that if the increase in world income is due to an increase in their production of import substitute goods,  $\delta_1$  could be negative. Moreover, strong economic performance measured by higher domestic income (GDP) can also indirectly lead to higher exports through improved levels of education. And,  $\delta_4$  to be negative reflecting the fact that as inflation rate increases, Nigerian goods and services become more expensive to foreign buyers.

In estimating the multiple regression model the unrestricted Ordinary Least Square (OLS) is used. The estimated parameters are subjected to evaluation by using the student t-statistic test and F-statistic test. While, the overall stability of the specified empirical model is tested using multiple co-efficient of determination ( $R^2$ ), adjusted  $R^2$  and Durbin-Watson test.

**4. Data Analysis and Interpretation**

The time series data employed for the estimation of the empirical model specified to capture the effect of macroeconomic factors on export demand in Nigeria is presented in Figure 4.1.



**Figure 4.1. Macroeconomic Factors of Export Demand in Nigeria**

The relationship between the variables is not clear enough to indicate whether it is positive or negative. The inconclusiveness of the direction of our variables necessitates the need for an empirical analysis. The result of the estimated regression is presented in Table 4.1.

**Table 4.1. Estimated Regression Results**

Dependent Variable: LOG(XD)  
 Method: Least Squares  
 Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<b>C</b>	-8.466654	1.518242	-5.576616	0.0000
<b>CDB</b>	0.000106	0.002994	0.035251	0.9721
<b>LOG(OP)</b>	-0.029636	0.182267	-0.162596	0.8717
<b>LOG(YD)</b>	0.906215	0.139105	6.514629	0.0000
<b>LOG(YW)</b>	0.492961	0.097647	5.048405	0.0000
<b>EXR</b>	-0.000909	0.001567	-0.580381	0.5651
R-squared	0.953900	Mean dependent var	9.416704	
Adjusted R-squared	0.947834	S.D. dependent var	1.234665	
S.E. of regression	0.281997	Akaike info criterion	0.432283	
Sum squared resid	3.021847	Schwarz criterion	0.675582	
Log likelihood	-3.510225	Hannan-Quinn criter.	0.522510	
F-statistic	157.2573	Durbin-Watson stat	1.694403	
Prob(F-statistic)	0.000000			

Source: Author's computation (2016)

Table 4.1 reports that cost of doing business proxy by inflation rate (*CDB*), domestic GDP (*YD*), and rest of the world income (*YW*) exert positive influence on volume of country's export ( $X_t^d$ ) in Nigeria between a decade period after Nigeria's independence and 2011 fiscal year and all of these effects conform with the theoretical expectation except cost of doing business. This implies that a 10% percentage increase in cost of doing business proxy by inflation rate (*CDB*), domestic GDP (*YD*), and rest of the world income (*YW*); volume of country's export ( $X_t^d$ ) increases by 0.004, 8.9% and 4.6% per cent respectively. The table 4.2 also reports that crude oil price (*OP*) and exchange rate (*EXR*) are found to exert negative effect on volume of country's export ( $X_t^d$ ) in Nigeria during the review periods and this does not conform to the apriori expectations. This implies that a 10% percentage increase in crude oil price (*OP*) and exchange rate (*EXR*) reduces the volume of country's export ( $X_t^d$ ) with a magnitude of 0.42 and 0.091 percent.

In assessing the partial significance of the estimated parameters for the considered variables, the t-statistics results are presented in the Table 4.1. The result shows that the estimated parameter for domestic GDP (*YD*), and rest of the world income (*YW*) were found to be partially statistically significant on volume of country's export ( $X_t^d$ ) at 5% critical level because their *p-values* are less than 0.05. Thus, the estimated parameters for crude oil price (*OP*), cost of doing business proxy by inflation rate (*CDB*) and exchange rate (*EXR*) are found to have insignificant effect on volume of country's export ( $X_t^d$ ) in Nigeria at 5% critical level.

Although, the F-statistic result shows that all the incorporated determinants and macroeconomic factors are simultaneously significant at 5% critical level. Thus, the adjusted R-squared result reveals that 94.8% of the total variation in volume of country's export ( $X_t^d$ ) is accounted by changes in crude oil price (*OP*), cost of doing business proxy by inflation rate (*CDB*), domestic GDP (*YD*), rest of the world income (*YW*) and exchange rate (*EXR*) during the review period. The Durbin- Watson test result reveals that there is presence of moderate negative serial correlation among the residuals, because of the d-value (1.694) is less than two. Thus, the regression is not spurious.

## 5. Policy and Policy Options

This study critically examined the precise the effect of macroeconomic determinants on export demand in Nigeria between a decades after independence 1970 and 2014. The estimated model results revealed that cost of doing business proxy by inflation rate, domestic output and rest of the world income exert positive influence on volume of country's export in Nigeria between a decade period after Nigeria's independence and 2014 fiscal year and all of these effects conform with the theoretical expectation except cost of doing business. Also, the study revealed that crude oil price and exchange rate is found to exert negative effect on volume of country's export in Nigeria during the review periods and this does not conform to the apriori expectations. The result shows that the estimated parameter for domestic GDP and rest of the world income were found to be partially statistically significant on volume of country's



export at 5% critical level, whereas the estimated parameters for crude oil price, cost of doing business proxy by inflation rate and exchange rate are found to have insignificant effect on volume of country's export at the same level.

On the basis of the empirical findings for the effect of macroeconomic factors on export demand in Nigeria, the following strategic policy options are proffered as follows:

- I. An important policy implication of our findings is that of stabilizing Nigeria's export earnings potential by counteracting the external factors that influence adversely the Nigerian exports such as crude oil price and cost of doing business.
- II. More importantly, diversification of the Nigerian exports would by and large improve economic fundamentals and may help bring about sustained growth in export earnings.
- III. Policies that improve the non-price competitiveness of Nigerian exports and stimulate better understanding of her external demand needs to be implemented. Moreover, in this study, supply side determinant, i.e., domestic GDP has a positive and significant impact on exports. An indication that domestic production, i.e. strong economic performance, leads to increased exports, which lends support to the GLE hypothesis.
- IV. There is need for government to strengthened and ensure a favourable image of the country to the global world as this has greater influence on her export earnings.

## References

- Adamu, P.A. (2005). Globalization and the Challenge for the Nigeria Economy. *Knowledge Review*, Volume 11, No. 2.
- Ajayi, S.I. (2001). What Africa needs to do to Benefit from Globalization. *IMF Finance and Development*, Vol. 38, No. 4, p. 6.
- Ajayi, S. Ibi. (2003). Globalization and Africa. *Journal of Africa Economies*, Volume 12 Supplement 1.
- Alege P.O. (2006). Impact of Globalization on Employment in the Nigerian Economy. *Paper Presented at the 47th Annual Conference of the Nigerian Economic Society*.
- Artis, M.J. & Okubo, T. (2008). Globalization and Business Cycle Transmission. *CEPR Discussion Paper 7041*.
- Asekunowo, V.O. (2004). What Economic Gains has Nigeria Recorded from Globalization so far?. *International Journal of Business and Common Market Studies*, Vol. 2, No. 1 and 2. Development Universal Consortia.
- Bahmani-Oskoe, M. & Niroomand, F. (1998). Long-run price elasticities and the Marshall-Lerner condition revisited. *Economics Letters*, 61, pp. 101-109.
- Bairoch, P. & Kozul-Wright, R. (1996). Globalization Myths: Some Historical Reflections on integration, Industrialization and Growth in the World Economy. *UNCTAD DP*, NO. 113.
- Brüggemann, A.; Donati, P. & Warne, A. (2003). Is the Demand for Euro Area M3 Stable?. *European Central Bank Working Paper*, No. 255.
- Calamitsis, E.A. (2001). The Need for Stranger Domestic Policies and International Support. *IMF Finance and Development*, Vol. 38, No.4, pp. 10-12.
- Central Bank of Nigeria Statistical Bulletin 2013, Volume 24.
- Dike, J. (2013). Measuring the security of energy exports demand in OPEC economies. *Energy Policy*, 60, pp. 594-600.



- Ekeocha, P.C. & Williams, O.E. (2006). *Globalization and Employment Generation: Evaluating the Impact of Trade on Aggregate Employment in Nigeria's Industrial Sector*.
- Hamori, S. & Matsubayashi, Y. (2009). Empirical Analysis of Export Demand Behavior of LDCs: Panel Cointegration Approach. *MPRA paper*, 17316, pp. 1-12.
- Hossain, A. (2009). Structural change in the export demand function for Indonesia: Estimation, analysis and policy implications. *Journal of Policy Modeling*, 31, pp. 260-271.
- Husein, J. (2007). Export-Led Growth Hypothesis: A Multivariate Cointegration and Causality Evidence For Jordan, *Journal of Developing Areas*, Vol. 42, No. 2, (forthcoming).
- Husein, J. (2008). Traditional Export Demand Relation: A Cointegration and Parameter Constancy Analysis. *International Journal of Applied Econometrics and Quantitative Studies*, 5(2), pp. 41-65.
- Khor, M. (2005). *Globalization and the South: Some Critical Issues*. Spectrum Books Limited, Ibadan.
- Lipsey R.G. & Chrystal, K.A. (2005). *Principle of Economics*, 9th Edition, Oxford Press.
- Los, B.; Timmer, M. & Vries, G. (2015). How important are exports for job growth in China?. A demand side analysis. *Journal of Comparative Economics*, 43, pp. 19-32.
- Maku, O.E. (2007). Globalization and Economic Development in Sub-Saharan Africa (SSA) Countries. *Journal of Economic and Management Sciences*. Volume 1, No. 2.
- McConnel, C.R. & Brue, S.L. (2002). *Economics; Principles, Problems and Policies*. Mc Graw-Hill Irwin.
- Nadeesha, D. & Silva, A. (2013). A time-series analysis of export-led shipping demand hypothesis for Sri Lanka. *International Journal of Scientific and Research Publications*, 3(9), pp. 1-6.
- Nanang, D. (2010). Analysis of export demand for Ghana's timber products: A multivariate co-integration approach. *Journal of Forest Economics*, 16, pp. 47-61.
- Onyeonoru, I. (2003). Globalization and Industrial Performance in Nigeria. *Africa Development*, Vol. XXXVIII, No. 3 and 4, pp. 36-66.
- O'Rourke, K. & Williamson, J.C. (2006). When Did Globalization Begin?. *NBER Working Paper*, 7632.
- Osman, M. & Evans, S. (2005). Time Series Analysis of the Somalian Export Demand Equations: A Co-integration Approach. *Journal of Economic and Social Research*, 4(2), pp. 71-92.
- Oviemumo, A.O. (2007). *International Trade as an Engine of Growth in Developing Countries: A Case Study of Nigeria (1980-2003)*. <http://searchwarp.com>.
- Scholfe, J.A. (2000). *Globalization: A Critical Introduction*. Houndmills: Macmillian Press.
- Senhadji, A. & Montenegro, C. (1999). Time Series Analysis of Export Demand Equations: A Cross-Country Analysis. *IMF staff papers*, 46(3), pp. 259-723.
- Usman, S. (1999). Implications of Globalisation for the Nigeria Economy: Globalization and Nigeria's Economy Development.
- Woerter, M. & Roper, S. (2010). Openness and innovation—Home and export demand effects on manufacturing innovation: Panel data evidence for Ireland and Switzerland. *Research Policy*, 39, pp. 155-164.
- Zheng, Z. & Sayed, S. (2012). Time-series analysis of U.S. Pistachio export demand in North America. *Journal of Food Distribution Research*, 42(1), pp. 124-129.