

Oil Exportation and Economic Growth in Nigeria

Awujola Abayomi.¹, Samuel.O. Adam², A.I. Alumbugu³ 1, Department of Economics, Bingham University, Nigeria.

2, Department of Statistics, University of Abuja, Abuja Nigeria

3, Department of Mathematics and Statistics, Federal Polytechnic Nasarawa, Nasarawa, Nigeria

Abstract

This paper examines the economic impact of oil exportation on Nigerian economy from 1970 – 2012. The objective of the study is to look at the impact of oil exportation on the economic growth in Nigeria. Secondary data were collected based on the model used in the research work and unit root test was conducted on the data to test their stationary, after which we perform co-integration test to analyze the long run relationship among the variables and VECM and impulse response was also employed for the analysis. The result obtained from our empirical analysis shows that there exist a long run relationship between the dependent variable and the explanatory variables. The conclusion of the study is that Exports should not be promoted at all cost, but rather the utilization and allocation of the physical resources and labor complement of the country in the most advantageous combination as between production for the local and foreign markets and that diversification should be seen as an economic management strategy aimed at ensuring stability of incomes.

Keywords: Exportation, Nigeria, VECM, GDP

1.1 INTRODUCTION

Among the important empirical findings in development economics in the twentieth century is that natural resource abundant economies have tended to grow more slowly than economies without substantial resources (Auty, 2001a; Rainis, 1991; Bulmer-Thomas, 1994; Sachs and Warner, 1995, 1997; Lal and Myint, 1996). Although the availability of natural resources does not necessarily imply a resource curse, on average resource abundant countries lag behind countries with fewer resources. Over the last four decades, for example, the Organization of Petroleum Exporting Countries (OPEC) as a whole experienced a negative rate of GDP per capita growth (Gylfason, 2001). Venezuela ranked among the ten wealthiest nations at the beginning of the nineteenth century, but despite its vast oil reserves, it is today downgraded to the level of a developing country. Similarly, Alaska is the only U.S. state with a negative growth rate over the last two decades, despite its extensive oil reserves and fishing industry (Lay and Mahmoud, 2004).

Auty and Mikesell (2000) found that Nigeria's oil notwithstanding, the country's GDP per capita of US\$400 is far below the US\$895 projected by the United Nations. Yet over the past 25 years, the country earned an estimated US\$300 billion as oil rents. In fact, it has been observed that of 65 countries that can be classified as natural resource rich, only four managed to attain both (a) long-term investment exceeding 25% of GDP on average from 1970 to 1998, equal to that of various successful industrial countries lacking raw materials, and (b) per capita GNP growth exceeding 4% per year on average over the same period.

Nigeria economy is basically an open economy with international transactions constituting an important proportion of her aggregate economic activities. Over the years, the degree of openness of the economy has grown considerably. Before Nigeria gains her political independence in 1960, agriculture was the dominant sector in the economy, which provides both cash crops and food crops to the economy and accounted for the largest part of the foreign exchange of the country. But, the discovery of crude oil production in commercial quantities changed the structure of the Nigerian economy. This led to the neglect of agricultural product, making the economy to depend heavily on production of crude oil. In 2000, oil and gas export accounted for more than 98% of export and about 83% of federal Government Revenue, (Odularu 2008). Nigeria's proven oil reserves are estimated to 35billion barrels, Natural gas reserves are 1000 trillion fti (2,800kmi) and its crude oil production was around 2.2million barrels (350,000mi) per day, (Odularu 2008). Furthermore, the oil and natural gas export generated huge revenue to the government and have a surplus balance of payment over the years. It was reported that 80% of Nigeria's revenue goes to the government, 16% spent on administrative expenses and 4% go to investors. The huge revenue from oil export only benefit 1% of the population due to corruption in Nigeria. (Odularu 2008). Mismanagement over the years back hindered economic reforms from achieving its full economic potentials. However, Nigeria Gross Domestic Product at purchasing power parity became more than doubled from \$170.7billion in 2005 to \$374.3billion in 2010, with informal sector putting the actual numbers greater than \$374billion. The Gross domestic Product per capita doubled from \$1,200 per person in 2005 to an estimated \$2,500 per person in 2009, with the informal sector included, the Gross Domestic Product per capita was estimated around \$3,500 per person, (Nigeria economy). Furthermore, the united states remains Nigeria's largest customer for crude oil export accounting for 40% of the country total oil exports, providing about 10% of overall United State oil imports and ranked as the fifty largest source for United State imported oil (Odularu 2008).



The objective of this study is to examine of the relationship between oil export growth and economic growth and to see if development in oil sector has led to development in other sectors of the economy. The rest of the paper will be divided into literature review and theoretical framework, methodology, analysis and conclusion and recommendation.

2.1 LITERATURE REVIEW AND THEORITICAL FRAMEWORK

2.2 Theoretical literature

2.2.1 Export and Economic Growth

The relationship between export performance and economic growth is an area that has been gives much attention by development economists. This has broadly classified economists into two: i.e. those that support the hypothesis that export growth has a positive impact on economic growth and those that reject the hypothesis that there is no positive impact on the economic growth. Exports are engine of growth. Awokuse (2008) argued that an increase in foreign demand for domestic exportable products can cause an overall growth in output via an increase employment and income in the exportable sectors. Balassa (1978), Esfahani (1991),Rodrik (1999), exports can provide foreign exchange which is critical to imports capital and intermediate goods that in turn raise capital formation beneficial for meeting expansion of domestic production and thus stimulate output growth.

According to (Helpman, Krugman, (1985), Boomstorm (1986)) international trade promotes specialization in production of export products which in turn boosts the productivity level, and causes the general level of skills to rise in the export sector. According to (Feder (1982), Lucus (1988), Edwards (1992)), export leads to re-allocation of resources from the inefficient non-trade sector to the trade sector and dissemination of the new management styles and production techniques through the whole economy. {Giles,Williams, (2000a, 2000b)}, the entire economy would benefit due to the dynamic spillover of the export sector growth. Chenery, Strout (1996), an increase in exports improves the balance of payment and enlarges the foreign monetary reserves, which enables the increase of investment goods import and facilities necessary for the domestic production growth. Jung and marshal (1985), argue that growth in real exports tends to cause growth in real gross national product (GNP) for three reasons: first, export growth may represent an increase in the demand for the country's output and thus serve to increase real GNP. Second, an increase in exports may loosen a binding foreign exchange constraint and allow increases in productivity intermediate imports and hence result in the growth of output. Third, export growth may result in enhanced efficiency and thus may lead to greater output.

2.3 Empirical Literature

The contribution of export growth to economic growth has been tested by different economists using different econometric techniques. Akanni (2007), examines if oil exporting countries grows as their earnings on oil rents increases, using PC-GIVE10, (ordinary least squares regression). The result shows that there is a positive and significant relationship between investment and economic growth and also on oil rents. In conclusion, oil rents in most rich oil developing countries in Africa do not promote economic growth. Idowu (2005), a causality approach examines that there is a relationship between exports and economic growth in Nigeria. Using Johansens multivariate co-integration technique. The result shows that there is stationary relationship between exports and gross domestic product (GDP). There is feedback causality between exports and economic growth. Hadi, etal (2009), investigate the impact of income generated from oil exports on economic growth in Iran. Using cobb-douglas production function, the economy of Iran adjusts fast to shocks and there is progress in technology in Iran. Oil exports contribute to real income through real capital accumulation. Mohammed and Amirahi (2010), examines if factors such as oil price, world oil supply and demand, production capacities enhanced export growth in Iran using Error Correction Version of ARDL. It was found that there is an inverse relationship between oil products consumption and oil export revenues. Iran had a significant positive growth in its oil revenues. Odularu (2010), used Harrod-Domar theory and solow's theory of economic growth used Ordinary Least Square regression and cobb-douglas production function were employed to test the impact of crude oil on Nigeria economic performance. The result shows that crude oil production contributed to economic growth but have no significant improvement on economy growth of Nigeria. Samad (2011), tested the hypothesis that there exist relationship between exports and economic growth in Algeria, using VEC Granger causality and block exogeneity Wald test. Augmented Dickey-Fuller test was used to run the regression. The result shows that the variables are non-stationary. It was concluded that there is causal relationship between economic growth, exports and imports. Khaled, etal (2010), tested if export enhanced economic growth in Libya Arab. Using cointegration with granger causality. The results show that income, exports, and relative prices are co integrated. It was concluded that both export and growth are related to each other. Muhammad, Sampata(1997), investigate if there is clear proved that exports led to economic growth, through the use of granger (1969) causality, ADF is used test for co-integration. The result shows that unidirectional causality from exports to GDP with positive relationship between the two variables is found. Rahmaddi (2011), examine the exports and economic growth nexus in Indonesia employing vector autoregressive (VAR) model. The findings indicate the significance of both



exports and economic growth to economy of Indonesia as indicated in GIRF analysis. It was concluded that exports and economic growth exhibits bidirectional causal structure, which is Export Led Growth in long-run and Growth Led Export in short-run. Gemechu (2002), using co integration and error correction approaches in the regression analysis examine the policies and test for the relationship between exports and economic growth. The result shows that export significantly affected economic growth in the short-run. There is causality runs from exports to economic growth.

3.1 METHODOLOGY AND SOURCES OF DATA

The data employed in this study are basically secondary. These secondary data are gathered from sources such as: Federal Office of Statistics (FOS) publication such as (a) Annual abstract of statistics (Various issues), office of planning and budgetary publications such as (a) annual National Accounts (various years). (b) National development plans, central Bank of Nigeria publication (a) CBN statistical year book (1970-2012 issues) (b) CBN Annual Report (c) Nigeria: Major economics and financial indicators etc.

3.2 Model Specification

The model employed in this study is multiple regression models. The model has adopted from Odulura, G.O (2008), is expressed as follows:

RGDP = f(L, k, DC, EX, P).

Where; L = Labour

DC = Domestic consumption of crude oil

EX = Crude oil export

TP = Total production of crude oil

The dependent variable is Real Gross Domestic Product (RGDP) and independent variables are: Labour (L), Capital (K), and Domestic Consumption of crude oil (DC), crude oil export (EX), Total Production of crude oil (TP). RGDP at constant prices 1970 to 1980 using 1977/78 constant basic prices and 1981 to 2011 constant basic prices. DC, EX, TP are in barrels.

Rewriting the above model in linear form includes:

 $RGDP = \beta_0 + \beta_1 L + \beta_2 k + \beta_3 DC + \beta_4 EX + \beta_5 TP + \mu_t.$

Where: β_0 = Intercept $B_1 - \beta_5$ = coefficients

 μ_t = stochastic term or error term at time t.

Priori expectation: the expected signs of the coefficients of the explanatory variables are: β 1>0, β 2>0, β 3>0, β 4>0, β 5>0.

RGDP is used as a measure of GDP because it takes care of inflation and it has been used by other authors such as (Odularu, 2008), (Odularu, Chinedu 2009), and there is easy access to RGDP data in Nigeria. Since real GDP grows over time, it is important to measure the growth rate. The following formulae has been used to calculate the growth rate of real GDP

EG = RGDP of current yr – RGDP of Previous yr x 100. RGDP of Previous yr

EG - represent Economic Growth.

3.3 Estimation Techniques

This study employs the ADF and Philips-Perron (PP) unit root test, Johansen co-integration test, VECM modeling, and granger causality. They are all adopted in order to arrive at a conclusion on the impact of oil export on economic growth in Nigeria.

3.4 Stationary Test

This study uses the stationary test to test if the given series has unit root. Stationary of a series is an important phenomenon because it can influence its behaviour. If x and y series are non-stationary random processes (integrated), then modeling the x and y relationship as a simple OLS relationship as in the following equation will only generate a spurious regression.

 $Y = \alpha + X + \xi t$

xlevel xt

Time series stationary is the statistical characteristics of a series such as its mean and variance over time. If both are constant over time, then the series is said to be a stationary process (i.e. is not a random walk/has no unit root), otherwise, the series is described as being a non-stationary process (i.e. a random walk/has unit root). Differencing a series using differencing operations produces other sets of observations such as the first-differenced values, the second-differenced values and so on.

x1st -differenced value xt - xt-1

x2nd -differenced value xt – xt-1



If a series is stationary without any differencing it is designated as I (0), or integrated of order 0. On the other hand, a series that has stationary first differences is designated I (1), or integrated of order one (1). ADF and PP test will be used to test the stationary of the variables.

3.5 Cointegration Test

If the time series variables are non-stationary, but cointegrated, at any point in time the two variables may drift apart, but there will always be a tendency for them to retain a reasonable proximity to each other. There may be more than one cointegrating relationship among cointegrated variables. Johansen test provides estimates of all such cointegrating equations and provides a test statistic for the number of cointegrating equations.

There are two types of Johansen test, either with trace or with eigenvalue, and the inferences might be a little bit different. It is possible to produce long-run coefficients and error correction models with this approach. This test permits more than one cointegrating relationship. It is commonly acknowledged that the statistical properties of the Johansen procedure are generally better and the cointegration test is of higher power compared to the EG one. However, it is important to point out that they are grounded within different econometric methodologies and thus cannot be directly compared. The main difference with the Engle-Granger approach is that it is possible to have more than a single cointegrating relationship. The test itself produces a number of statistics which can be used to determine the number of cointegrating vectors present. Another difference with the Engle-Granger test is that, there are two separate tests for the number of cointegrating relationships and they do not always agree to the number present.

3.6 Vector Error Correction Model (VECM)

VECM model comes to play when it has been established that, there exist a long run relationship between the variables under consideration. This enables us to evaluate the cointegrated series. In a situation where there is no cointegration, VECM is no longer required and we can precede to Granger causality tests directly to establish casual relationship between the variables.

VECM regression equation is given below as thus:

$$\Delta Y_{t} = \alpha_{1} + P_{1}e_{1} + \sum_{i=0}^{n} \beta_{i}Y_{t-i} + \sum_{i=0}^{n} \mathcal{F}_{i}\Delta_{t-i} + \sum_{i=0}^{n} Y_{i}Z_{t-i}$$

$$\Delta X_{t} = \alpha_{2} + P_{2}e_{i-1} + \sum_{i=0}^{n} \beta_{i}Y_{t-i} + \sum_{i=0}^{n} \mathcal{F}_{i}\Delta_{t-i} + \sum_{i=0}^{n} Y_{i}Z_{t-i}$$

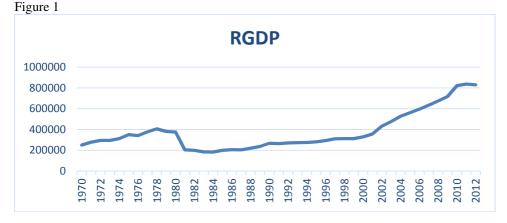
In VECM, the cointegration rank shows the number of cointegrating vectors. For example a rank of two indicates that two linearly independent combinations of the non-stationary variables will be stationary. A negative and significant coefficient of the ECM (i.e. $e_{\rm t-1}$ in the above equations) indicates that any short-term fluctuations between the independent variables and the dependent variable will give rise to a stable long run relationship between the variables.

4.1 ANALYSIS OF RESULT

4.2 Trend Analysis

From the above table, six graphs wer plotted to show their different rates of change annually and how it affected the economy of the country in those years. To proceed with the test, graph of each series is first visually examined to see whether a trend is presented or not as shown in the diagrams below:

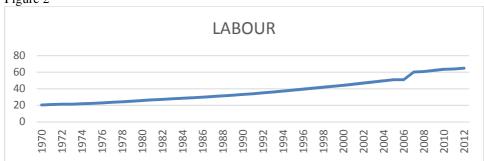
4.3 Trend Analysis





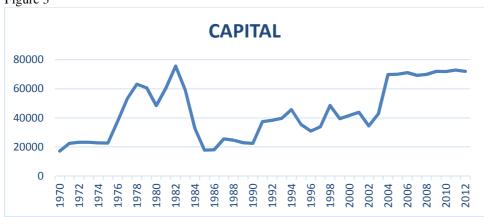
Source: Author's Computation

Figure 2

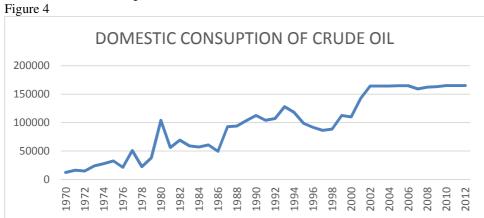


Source: Author's Computation

Figure 3

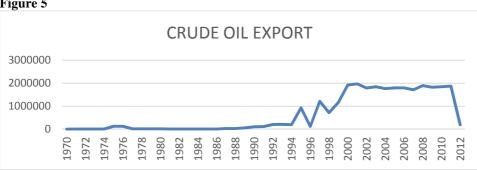


Source: Author's Computation



Source: Author's Computation

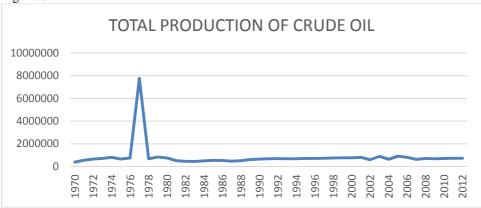
Figure 5



Source: Author's Computation







Source: Author's Computation

From the figures above, the RGDP and the graph of Labour depict increasing at an increasing rate trend all through the year under consideration with the exception of the RGDP that is relatively unstable in it increase with the up and down movement in the trend. Figure 3 and 4 also depict a high level of instability in it increase as it experience dip decrease in some year followed by instant picked up which led to another increase. Figure 5 depict an inconsequential movement up to 2007 when it experience a drastic increase which immediately fall the same way and has remain constant till date. Figure 6 which was increasing at a constant rate experienced an increase in 1977 and fall back in 1979 which then has been highly inconsequential till date.

4.4 Unit Root Test

This study commence it empirical analysis by first testing the properties of the time series, used for analysis. We perform a unit root test on each of the variable since the variables are time series in nature. This enables us to avoid the problems of spurious result that are associated with non-stationary time series models. The test is conducted using two different unit root models. That is, the Augmented Dickey Fuller (ADF) model and the Philips-Perron (PP) model. The essence of using the two test is for confirmatory testing and the result of the unit root test is shown in table 4.2 below:

Table 4.1: Unit Root Test Result

VARIABLE	Augmented	Dickey-Fuller (AT	Phillip-Perron (PP) Test				
VARIABLE	Augmented Dickey-Fuller (ADF) Test @ LEVEL @ 1ST STATUS		@ LEVEL @		1ST	STATUS	
	@ LEVEL	DIFFERECNE	SIAIUS	@ LEVEL	DIFFERECNE	1	SIATUS
LRGDP	-0.2852	-5.1328*	I(1)	-0.1556	-5.2346*		I(1)
LL	-0.6486	-7.9691*	I(1)	-1.2143	-8.0313*		I(1)
LK	-2.3690	-5.2891*``	I(1)	-2.1437	-5.0248*		I(1)
LCD	-2.0452	10.5875*	I(1)	-2.4870	-10.9161*		I(1)
LE	-1.3785	-3.3722*	I(1)	-1.5622	-8.0314*		I(1)
LTP	-2.5773	-5.0262*	I(1)	-2.2380	-9.1075*		I(1)

SOURCE: Author's Computation

Notes: * indicates significant at one percent or a rejection of the null of no unit root at the one percent level** indicates significant at five percent or a rejection of the null of no unit root at the five percent level. Number of lags wasselected using the AIC criterion.

From the result presented in table 4.1 above, it was observed that the variables are not stationary at level meaning that the null hypothesis of unit root cannot be rejected since the asymptotic critical values is less than the calculated value for ADF and PP. After all the variables are transformed to their first difference, the null hypothesis is rejected and became stationary. Therefore, they are said to maintain stationary at an integration of order one, I (1).

4.4 Cointegration Tests

Having established the unit root properties of the variables, the combination of two or more non-stationary variables could however be stationary if these series share a common long-run equilibrium relationship. In this case, these variables are said to be cointegrated. Thus, given the time series characteristics of the variables, this study further investigates employing (Trace Statistics) and (Maximum Eigenvalue) using methodology proposed by Johansen and Juselius (1990). Hence, the result of the co-integration test (that is the existence of a long term linear relation) is established in the table 4.2 below:



Table 4.2: Result of Johanson Cointegration

Unrestricted Cointegration Rank Test (Trace) Unrestricted Cointegration Rank Test (Max-Eige										
Hypothesizd	Eigen-vale	Trace	0.05Critical		Eigen-Value	Maxi-Eigen	0.05			
No. of CE(s)		Statistic	Value		Value			Statistic	Critical	
							Value			
None *	0.719565	123.2849	95.753	366	0.719565	52.12793	40.07757			
At most 1 *	0.618221	71.15697	69.818	389	0.618221	39.47942	33.87687			
At most 2	0.300125	31.67755	47.850	513	0.300125	14.63101	27.58434			
At most 3	0.208955	17.04654	29.79	707	0.208955	9.610395	21.13162			
At most 4	0.157177	7.436144	15.494	471	0.157177	7.010926	14.26460			
At most 5	0.010318	0.425218	3.8414	466	0.010318	0.425218	3.841466			
* denotes rejection of the hypothesis at the 0.05 level										
Trace test indicates 2 cointegratingeqn(s) at the 0.05 level										
Max-eigenvalue test indicates 2 cointegratingeqn at the 0.05 level										

SOURCE: Author's Computation

The result of multivariate cointegration test based on Johansen and Juseliuscointegration technique reveal that, there are two cointegrating equations at 5% for the trace statistic and one cointegrating equation for Max-Eigen, This result suggests that the appropriate model to be used for further analysis is the VECM specification with more than one cointegrating vector in the model.

4.5 Vector Error Correction Model

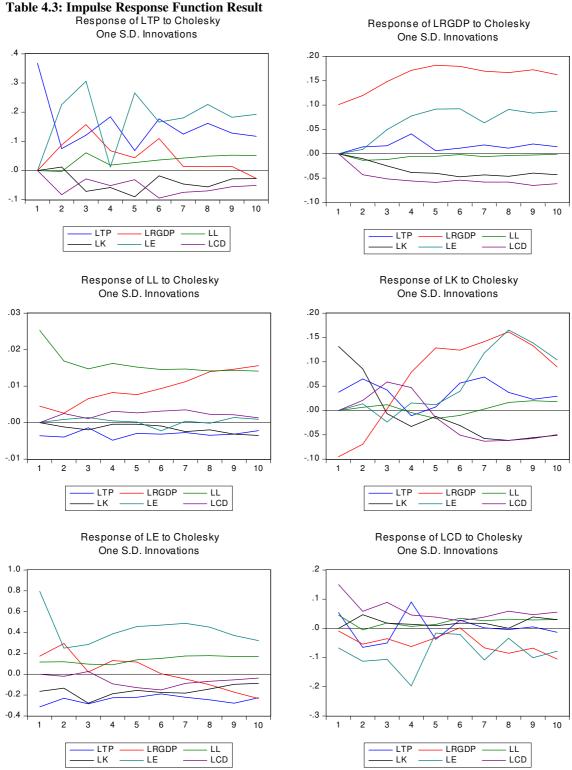
The presence of cointegration between variables suggests a long term relationship among the variables under consideration. Then, the VEC model was applied and the long run relationship between real gross domestic product, labour, capital, domestic consumption of crude oil, crude oil export and total production of crude oil in Nigeria.

The VECM result presented above shows that all the explanatory variables' relationship are in line with the aprior expectation and satisfy the stability condition, that is, the vector error correction term in each of the models should have the required negative sign and lie within the accepted region of less than unity. The vector error correction term in column two in both equations have the expected negative sign and is statistically significant and it shows a low speed adjustment towards equilibrium. The results of the estimation show that the explanatory variables account for about 72 percent variation in economic growth in Nigeria and 28 percent can be due to other factors not captured in the model. Taking into consideration the degree of freedom, the adjusted R-squared shows that 56 percent of the dependent variable is explained by the explanatory variables

4.6 Impulse Response

The impulse response describes the reaction of the system as a function of time (or possibly as a function of some other independent variable that parameterizes the dynamic behavior of the system). The impulse response function for the variables is depicted in Table 4.3.





The impulse response function shed light on the dynamics of the variables included in the VAR system as a result of shocks to either one of these variables over ten months. From the above, it can be deduced that, RGDP respond positively to a one-time standard deviation innovation shock from itself which represent the highest response compare to other explanatory variables. Also, RGDP respond positively to a shock in log of total production of crude oil and log of labour though very low compare to the response of RGDP to itself.

5.1 CONCLUSION AND RECOMMENDATONS

5.2 Conclusion

Before the discovery of the oil in Nigeria, the agricultural sectors was the dominant of the Nigeria economy



contributing about 80% of the total government revenue and more than 85% of the total (GDP) Gross Domestic Product.

However, with the discovery of the oil, the government emphasis shifted from agriculture to petroleum industry which now contributes over 80% of the total Gross Domestic Product and over 90% of total government revenue.

In this study, we have reviewed the modern empirical literature on the relationship between oil export and economic performance. Despite the size and potential diverse nature of the economy, Nigeria is still largely a primary commodity produced and is a vulnerable as its poorer neighbors to the adverse trends in the world economy which used to grow very rapidly, but whose personal and corporate saving have divided in recent years, and where both direct foreign investment and foreign loans have now turned to a substantial net outflow rather than inflow. Foreign trade accounts for nearly over 50% of total output and close to 90% of its exports earnings come from oil and other minerals. Industrial exports are less than 10%. Its principal imports consist of capital and intermediate goods and over the past decades it has experience deterioration in its terms of trade. Oil trade is the only escapable route from the low level of subsistence farming to greater economic haven. Successful export performance requires policies which provide adequate incentives and investment in the export sector and efficient input substitution and ensure that these incentives will be steadily maintained.

5.3 Recommendations

Based on the findings on the economic impact of crude oil exportation in Nigeria (1970 - 2011), the following recommendations are suggested in solving some of the identified problems. These are;

- Exports should not be promoted at all cost, but rather the utilization and allocation of the physical resources and labor complement of the country in the most advantageous combination as between production for the local and foreign markets.
- Protection must be reduced and measures to stimulate internal mobility, competition, and efficient pricing simultaneously must be taken.
- Trade integration among less developed countries fosters the rapid expansion of trade within the group's
 expansion, as far as it occurs, reflects a process of trade creation Nigeria. Trade-able exports to neighboring
 territories will lead to a rapid expansion in external trade and acceleration in the economic growth and
 therefore should be encourage.
- Resources diversification should be seen as an economic management strategy aimed at ensuring stability of incomes. In an agricultural economy like Nigeria, diversification must first be directed towards that sector which emphasizes improved varieties of crops for domestic and industrial use and for export.
- The government should encourage the establishment of private agencies in any part of the country by individuals, company of association indigenous foreign ensuring that safety and enrolment condition are met.

It is obvious that if the above few recommendations are put in place and addressed, this will develop the Nigeria economy in a short period of time.

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