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Empirical Analysis of Factors Driving Economic Growth in Nigeria: VECM Analysis

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ABSTRACT

This study examined the factors driving economic growth in Nigeria from the period of 1981-2014 using Johansen co-integration and VECM analysis technique to test for the existence of co-integration between the variables of this study and causal impacts. The result found that there is no causal relationship between labour and economic growth in Nigeria and causality do not run from labour to economic growth. Also, there is a causal relationship between economic growth and capital in Nigeria, and capital is causing changes in economic growth in Nigeria. There is also a causal relationship between capita and labour, the granger causality result shows that there is a causal relationship between labour and capital. This study therefore recommend that the government should use expansionary monetary and fiscal policies that reposition the structure of Nigerian economy to revive economic activities in the economy which will help rise both labour and capital for increased growth rate.

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Introduction

Economic growth is one of the important targets that most economies strive to achieve. National budgets often highlight policies which aim at stimulating growth in the various aspects of the economy. It is expected that sound economic policies when implemented will speed up economic process. This in the long run may reduce the gaps between the rich and the poor in the society. Evidence of economic growth is also seen in the per capita income of a nation. Investopedia defined economic growth as an increase in the capacity of an economy to produce goods and services compared from one period of time to another. This economic growth is usually associated with technological changes. An example is the significant growth in the world's economy during and after the introduction of the internet in most countries, globalization and deregulation. This has catapulted the global growth rate to around 3.7% in 2011

Economic growth, from the early period of economic history, engaged the attention of man and his governments. As far back as 17th and 18th centuries, writers like Adam Smith, David Ricardo, John Stuart Mill, as well as state theorist like Karl Marx, Friedrich List Karl Bucher, W Rostow, and neo classical economists such as Arthur Lewis (1978) have all been preoccupied with the quest for unearthing the forces and processes that cause a change in the material progress of man. This is also applicable to successive governments and states in these modern times. In Nigeria for instance, the broad objective of the national economic policy has been the desire to promote sustainable economic growth for the vast majority of Nigerians through the adoption of various monetary and fiscal policies. Unfortunately, her economic growth performance has been characterized by fits and starts and the prospects of her rapid economic growth appear unachievable as reflected in her inability to realize sustainable full growth potentials and to significantly reduce the rate of poverty in the economy.

Several countries that have achieved rapid economic growth since World War II have two common features. First, they invested in education of men and women and in physical capital. Second, they achieved high productivity from these investments by providing efficient capital markets, competitive trade-leading roles, and higher level of economic efficiency driven by technological capabilities, stable polity, appropriate economic policy and economic system, World Bank. However, as a result of market failure that may likely occur in the process of development, it may not be ideal to leave the process of economic development entirely to the market forces especially in the developing economies like Nigeria.

Secondly, the quality of the government and its economic policies matter a lot. The radical theorist and the early proponents of development economics were of the view that growth could be internalized. Developments in the world economies have shown that it is futile for economies to isolate themselves from rapidly integrating world, Essien and Bawa (2007). Economic growth is a key policy objective of any government.

In addressing the pertinent issues in economic management, experts and economic planners have had to choose between or combine some of the macroeconomic variables. Economic growth, proxies by Gross Domestic Product (GDP) confers many benefits which include raising the general standard of living of the populace as measured by per capita national income, making income distribution easier to achieve, enhance time frame of accomplishing the basic needs of man to a substantial majority of the populace.

Conversely, economic stagnation can bring destabilizing consequences on the citizenry, Lewis (1978). Controversies that trail growth-related issues are many, but the present and more incontrovertible is the discourse on economic growth within the context of macro-economic behaviour of the economy.

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This is in relation to how the economic policy goals could be achieved by the available policy instruments. To date, the general consensus is that the rate at which declining economic growth rate is permeating the LDCs requires urgent policy response in order to bring about sustainable economic growth (Essien and Bawa, 2007).

Furthermore, the Nigerian economy is basically an open economy with international transactions constituting an important proportion of her aggregate economic activity. Consequently, the economic prospects and development of the country, like many developing countries, rest critically on her international interdependence. Over the years, despite the considerable degree of her trade openness, her performance in terms of her economic growth has remained sluggish and discouraging, Odedekun (1997).

Secondly, Nigeria's trade policy since her independence in 1960 has been characterized by policy swings, from high protectionism to liberalism. The main objective of her trade policy is aimed at influencing trade process that can promote sustainable economic growth but this objective has become very difficult to achieve at present, Yesufu (1996).

There is also an implicit belief that the Nigerian economic environment has been unable to attract foreign direct investment to its fullest potentials, given the unstable operating environment, which is characterized by inefficient capital markets, high rate of inflation, unstable polity, stringent policies and fragile financial system, among others. Another major problem is the element of fiscal dominance.

A size of fiscal deficit has an implication for domestic savings and investment and ultimately economic growth, in Nigeria, the main factor underlying these outcomes is the volatility of government expenditure arising from the boom and burst cycle of government revenue which is derived mainly from single export commodity (oil), whose price is also volatile. To worsen the problem, these expenditures are not channelled to productive sectors of the economy, Yesuf (1996).

Prior to Nigeria political independence in 1960, agriculture was the mainstay of the economy. The present heavy reliance on primary commodity has induced adverse terms of trade shocks leading to huge current account deficits and exchange rate volatility and consequently a weak external sector for Nigeria. The trend in the current account amplifies the degree of import-dependence of the Nigerian economy. The deployment of the lean resources to finance huge debt service payments crowds out public investment in the productive sectors of the economy and with these developments, achievement of sustainable economic growth have become a difficult task. Against this background of sluggish and volatile rate of economic growth which is accompanied with declining productivity signals, and Nigeria being a developing economy characterized by significant debt burden, structural imbalance and uncertainties, an insight into the determinants of Nigeria's economic growth as well as their causal relationship with growth, has become pertinent.

However, most of the scholars of economics are of the view that the problem of Nigeria's economic growth has not been well understood thus, improperly managed. Most of the reviewed studies have some methodological and conceptual problems that undermine their accuracy and thus their efficacy for effective policy purposes. For instance, non- application of unit root test to reduce or if possible, eliminate spurious regression due to non-stationary properties of the time-series and the use of cross-country analysis that precludes the country specifics, may all lead to biased inferences, Engel and Granger (1987) and Gujarati (2009). Reviewed studies like

Rogolf (2002), Akintoby et al (2004), Essien (2002) and Essien and Bawa, (2007), did not apply unit root test and some also applied panel and cross-sectional approach without taking into consideration the country's policy differences.

It is the quest of Nigeria to achieve higher level of economic growth. Various policies and programmes have been suggested to drive this growth process like the Vision 2020 and so on. Studies reveal that factors such as land, labour, foreign direct investment (FDI) and government spending stimulate the growth process in the sectors. A large number of studies have found evidence suggesting that human capital is significant in determining economic growth (Barro, (1991), Mankiw et al, {1992}, Barro and Sala-i-martin (1995), Brunett, et al, (1998), Hanushek and kimkwi, (2000). FDI on growth has provided more or less consistent findings affirming a significant positive link between the two (Borensztein et al, (1998)); Hermes and Lensink, (2000); Lensink and Morrissey, (2006). Also according to Romer (1986&1990) and other studies, solow, (1962), Lucas, (1988) and Grossman and Helpman, (1991), the world economy grows because of technological progress.

With the guidance of other of other study relating to this course there are many determinants of economic growth. I choose to examine how Gross capital fixed formation and labour of total productivity have so far determined the economic growth in Nigeria. As well as check for other factors driving economic growth such as foreign direct investment, oil price, trade openness.

Recognizing the above gaps and challenges of the previously reviewed studies, there is need to re-examine the problem of economic growth holistically by applying Nigerian time series using modern analytical econometric techniques such as Co-integration that explores the long run relationship between economic growth and some generally accepted determinants of economic growth Unit root test, Error Correction Mechanism (ECM) and Granger Causality tests that check for the causal relationship between economic growth and the selected economic growth determinants, to see if a more authentic result could be achieved for effective economic planning.

2. Theoretical Framework of the Study

Economic growth has posed an intellectual challenge ever since the beginning of systematic economic analysis. Adam Smith claimed that growth was related to the division of labour, but he did not link them in a clearway. Thomas Matthus developed a formal model of a dynamic growth process in which each country converged toward a stationary per capita income. This and several economist gave their views and perspectives to economic growth.

Economic growth is the expansion of production possibilities that results from increased availability and increased productivity of economic resources expansion and productivity measured by the annual percentage increase in a nation's level of real GDP (Hyman, 1997).

Economic growth is the change in a countries output from one year to the next year. Hence economic growth is a term to indicate the increase of per capita income gross domestic product (GDP) or other measure of aggregate income, it is often measured as the rate of change in GDP (Landsburg and Feinstone, 1997). According to Adam Smith's (1776), explanation of economic growth, although not neatly assembled in one parts of the wealth of nation's growth the core of it lies in his emphasis of division of labour as the society's capacity to increase its productivity hence economic growth becomes an out-growth of division of labour.

Godwin (2007) defines economic growth as an increase in real gross domestic product (GDP) that is, gross domestic adjusted for inflation. Spencer et al. (1993) also define economic growth as the rate of increase in an economy's full employment real output or income overtime stated differently. According to Samuelsson and Nordhaus (1995) economic growth is an increase in the total output of nations over time. Economic growth is usually measured as the annual rate of increase in a nation's real GDP (or real potential GDP). It can be defined as the process by which productivity, living standards and output increases (DeLong et, al 2006). Johnson (2000) defines economic growth as that part of economic theory that explains the rate at which a country's economy grows over time. It is usually measured as the annual percentage rate of growth of the country's major national income accounting aggregate, such as the gross national product (GNP) or the gross domestic GDP with appropriate statistical adjustment to discount the potentially misleading effects of price inflation. According to Keynesian view on economic growth, Government intervention in the market place and monetary policy is the best method of ensuring economic growth and stability.

In summary economic growth simply means increase in per capita income or increase in GNP. in recent literature the term economic growth refer to sustained increase in a country's output of goods and services or more precisely per capita income. Economic growth is measured in monetary terms and looks at no other aspects of development that's why very often economic growth in a nation does not necessarily signify economic development, most times growth in a nation can be accompanied with increase in poverty, inequality and growing levels of unemployment, type of growth if not accompanied by economic development in a long term is bound to have an adverse effects on society

2.1 Empirical Framework of the Study

Essien (2001) studied the determinants of economic growth using what is known as the vector error correction method (VECM). The study was based on the data collected from 1981 to 2014. The study attempted to establish the contribution of capital stock to economic growth, both in the short-run and the long-run, the impact of growth in the previous years on current growth and the impact of foreign exchange rate on economic growth. Other objectives were to assess the impact of inflation, liberalization policy and debt burden (ratio of debt to export) on the real GOP. The study concludes that there is a long-run relationship between capital stock and economic growth, and that the growth rate in the previous year's impacts on the current growth rate negatively. The study also established that the impact of inflation on the GDP was negative because it causes uncertainty leading to a reduction of the effectiveness of price mechanism.

Essien (2001) work on economic growth has a lot in common with this study as it attempts to establish the impact of past growth on current growth rates, the impact of inflation, foreign exchange rate, and establishing of the long-run relationship government expenditure. Finally, the study demonstrated that budget impact on the real GDP is positive.

Ozumba (1996) examined the need to harness the potentials of oil and gas of Nigeria for effective economic development. He used analytical method to submit that the petroleum sector contributes to economic development by providing energy, the foreign exchange needs of the country, and government revenue.

He however, regretted that the income from petroleum is not invested in diversifying the productive base of the Nigerian economy.

Oyeranti (2003) studied the impact of foreign investment in economic development of the country. He reviewed empirical Studies in this area and submitted that the impact of foreign private investment on economic growth and development can be remarkable. The need for developing countries maximizes the benefits derivable from foreign private investment.

3. Data and Methodology

3.1 Data Sample

This study investigates the the causal relationship between economic growth and the selected economic growth determinants, to see if a more authentic result could be achieved for effective economic planning 1981 to 2016 .As a proxy for the world price of crude oil (OIL) , this study uses the Brent spot price (measured in US dollars per barrel), which is the most commonly used benchmark for pricing in the crude oil market (Dagher and Hariri,2013) sourced from the U.S. Energy Information Administration (EIA).

3.2 Models Formulation

Our main objective is ascertain the determinants of economic in Nigeria. Therefore, in our model, we augment the neoclassical Cobb–Douglas production function by incorporating selected macroeconomic variables in addition to the capital and labor force (see Rivera-Batiz (2004) and N'Zue (2011)

$$Y = AK^\alpha L^{1-\alpha} \quad (1)$$

Where Y=aggregate GDP,L=labor,K=capital and A=TFP

Dividing by L and taking the natural logs

$$\frac{Y}{L} = A \left(\frac{K}{L}\right)^\alpha$$

$$\ln\left(\frac{Y}{L}\right) = \ln A + \alpha \ln\left(\frac{K}{L}\right)$$

Denote TFP as a function of financial deepening and selected macroeconomic variables:

A=f(MAC) where MAC is selected macroeconomic variables based on past studies. This suggest our model as thus:

$$\left(\frac{Y}{L}\right)_t = \alpha_0 + \alpha_1 MAC_t + \alpha_2 \left(\frac{K}{L}\right)_t + \varepsilon_t \quad (2)$$

where Y/L is GDP per worker in constant 2005 prices, K/L is capital stock per worker. RGDP captures economic activities in the economy (Nwani, Iheanacho & Okogbue, 2016). Other variables are gross fixed capital formation, labour force are included in the model in equation (2): oil price (OILP).. Apriori, they are expected to have positive signs except inflation. Inflation captures the degree of macroeconomic stability in the economy.

3.3 Model Specification

This study employs a multivariate Vector Error Correction Model (VECM) that uses the Granger causality test and generalized variance decomposition analysis to study the relationship between crude oil prices, exchange rate and stock market performance in Nigeria. All the data series are transformed into the natural log form. Specifically, Oil Price in the natural log form is represented as *lnOil*, SE FD Index in the natural log form is given by *lnGFCG* and LABOUR in the natural log form represented as *lnExch*.

The first difference of their natural log values are represented as $\Delta \ln Oil$, $\Delta \ln OPN$ and $\Delta \ln gfcf$ respectively. The first step is to investigate the order of integration of the variables used in the empirical study. The ADF (Augmented Dickey Fuller) test will be used, complemented with the PP (Phillips Perron) in which the null hypothesis is $H_0: \beta = 0$ i.e. β has a unit root, and the alternative hypothesis is $H_1: \beta < 0$. If the unit root tests confirm that at least some of the variables are I(1), then the next step

would be to test if they are cointegrated, i.e. if they are bound by a long-run relationship. Cointegration exists between a set of non-stationary variables when a certain linear relationship of the series is stationary.

3.3.1. Johansen co integration test

The test of the presence of long run equilibrium relationship among the variables using Johansen Co integration test involves the identification of the rank of the n by n matrix Π in the specification given by.

$$\Delta Y_t = \beta + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-1} + \Pi Y_{t-k} + \epsilon_t \quad (1)$$

Where Y_t is a column vector of the n variables Δ is the difference operator, Γ_i and Π are the coefficient matrices, k denotes the lag length and β is a constant. In the absence of cointegrating vector, Π is a singular matrix, indicating that the cointegrating vector rank is equal to zero. Johansen co integration test will involve two different likelihood ratio tests: the trace test (λ_{trace}) and maximum eigen value test (λ_{max}) shown in equations below:

$$J_{trace} = -T \sum_{i=r+1}^n \ln(1 - \lambda_i^{\hat{}})$$

$$J_{max} = -T \ln(1 - \lambda_{r+1}^{\hat{}}) \quad (2)$$

Where r the number of individual series, T is the number of sample observations and λ is the estimated eigen values. The trace test tests the null hypothesis of r cointegrating vectors against the alternative hypothesis of n cointegrating vectors. The maximum eigen value test (λ_{max}), on the other hand, tests the null hypothesis of r cointegrating vectors against the alternative hypothesis of $r + 1$ cointegrating vectors. If the two series are found to be co-integrated, then vector error correction model (VECM) is appropriate to investigate causality relationship.

3.4. Vector Error-Correction Modelling (VECM)

The Short run equilibrium relationship is tested using Vector Error-Correction Model (VECM). VECM is a restricted VAR that has cointegration restriction built into the specification. The VECM analysis in this study is based on the function: $y_t = f(\text{oil returns, Exchange rate returns, and stock returns})$. The VECM involving three co-integrated time series is set as:

$$\Delta \ln RGDP_t = \alpha_1 + \sum_{k=1}^p \mu_{1k} \Delta \ln RGDP_{t-k} + \sum_{k=1}^p \delta_{1k} \Delta \ln X_{t-k} + \lambda_1 Z_{t-1} + \epsilon_t \quad (4)$$

Where $Z_{(t-1)}$ is the error correction term obtained from the cointegration model. The error correction coefficients λ_1 , λ_2 and λ_3 indicate the rate at which it corrects its previous period disequilibrium or speed of adjustment to restore the long-run equilibrium relationship. Hence, they are expected to capture the adjustment in independent variables towards the long-run equilibrium whereas coefficients of the selected variables in the vector X are expected to capture the short-run dynamics of the model. This method of analysis permits us to

Table 1. Unit root

Variable	In Level I(0)			
	ADF		PP	
	t-stat	P-value	t-Stat	P-value
LNRPCGDP	-1.8751	0.3394	-1.9155	0.3214
LNLABF	0.4391	0.9817	0.4391	0.9817
GCF	-2.8573	0.0614	-2.8497	0.0624
FDI	-2.7862	0.0712	-2.6310	0.0971
OILP	-0.6333	0.8496	-0.5729	0.8634
OPEN	-1.9130	0.3225	-1.9268	0.3165

test for the di
Moreover, it
between the
essential to
VECM mode
the missing
overparamete
introduces th
Porter, 2009)

The study uses Akaike information criterion (AIC) to determine the optimum lag length.

3.5. Granger causality test and Variance Decomposition

The VECM employed in this study uses the Granger causality test and generalized variance decomposition to examine the short run dynamic relationship between the three variables. Granger causality test is used to ascertain the direction of causality between the three variables. Impulse response and variance decomposition can help in explaining the effect of a shock over time on the variables in a system. Assuming one-period shock is introduced to any of the variable by increasing ϵ_1 by one standard deviation at time $t = 0$ we can observe how this impulse will affect other variable immediately and several periods later. The relative strength of the Granger-causality among the variables beyond the sample period is explained by identifying the relative importance of a variable in generating its own variations. Variance decompositions provide a literal breakdown of the change in value of the variable in a given period arising from changes in the same variable in addition to other variables in previous periods. A variable that is optimally forecast from its own lagged values will have all its forecast error variance accounted for by its own disturbances (Sims, 1982). This analysis will therefore help to explain how much a random shock to one innovation is responsible for predicting subsequent variation of the other innovation that is not already accounted for by its own variation.

4. Empirical Results

4.1. Unit Root Tests Results

To test the stationary properties of the data, ADF (Augmented Dickey Fuller) and PP (Phillips Perron) unit root tests are employed. The results for both the level and differenced variables are presented in Table 1 below:

Having established that all variables included in table 2 are integrated of first difference, the next step is to check for the existence of a co integration relationship among the variable series using the Johansen-Juselius approach. The co integration test results are reported in Table II. The results indicate the existence of co integration between GDP, Labour force, Gross fixed capital formation, foreign direct investment, Oil price and Openness of trade. The maximum eight value statistics reject the null hypothesis of no co integration at 5 per cent level. According to N" Zue (2006), when cointegration exists between dependent and independent variables, the

Table 2. Unrestricted Cointegration Rank Test (Trace).

Hypothesized			0.05	
No. of CE(s)	Eigenvalue	Trace Statistic	Critical value	Prob.**
None *	0.870982	167.0055	95.75366	0.0000
At most 1 *	0.811159	103.5236	69.81889	0.0000
At most 2 *	0.564411	51.85119	47.85613	0.0201
At most 3	0.434484	26.08846	29.79707	0.1261
At most 4	0.189486	8.417939	15.49471	0.4218
At most 5	0.059610	1.905266	3.841466	0.1675

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values Eigenvalue)

Table 3.

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical value	Prob.**
None *	0.870982	63.48188	40.07757	0.0000
At most 1 *	0.811159	51.67239	33.87687	0.0002
At most 2	0.564411	25.76272	27.58434	0.0840
At most 3	0.434484	17.67052	21.13162	0.1427
At most 4	0.189486	6.512673	14.26460	0.5483
At most 5	0.059610	1.905266	3.841466	0.1675

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

Table 4.**Normalized cointegrating coefficients (standard error in parentheses).**

LNRPCGD					
P	LNLABF	GCF	FDI	OILP	OPEN
1.0	-0.592574	0.003821	-0.022375	0.089596	-0.191748
	(0.35340)	(0.00566)	(0.00331)	(0.01901)	(0.00971)
Log likelihood	426.8543				

The normalized co-integrating coefficients for one co-integrating equation given by the existence of long run relationship are shown below:

$$\ln PCGDP = 1.000 + 0.5925 \text{LNLABF} - 0.00382 \text{GCF} + 0.0223 \text{FDI} - 0.0895 \text{OILP} + 0.1917 \text{OPEN}$$

Engle-Granger theorem establishes the encompassing power of the ECM over other forms of dynamic specification.

From the result of the co-integration equation, the long run relationship between per capita gross domestic product and the total labour force is positive, showing that if there is 1% increase in labour force, per capital real gross domestic product in Nigeria will increase by about NO.592574. It implies that there is a positive relationship between labour force and per capital real gross domestic product in Nigeria. Also, there is a positive relationship between Foreign direct investment and the per capital gross domestic product in Nigeria. Thus, if foreign direct investment increases by 1%, real per capita gross domestic product will increase by a NO.022375 in Nigeria. But, there is a negative relationship between per capita real gross domestic product and gross fixed capital formation in Nigeria in the long run. If gross domestic savings increases by 1%, per capita gross domestic product in Nigeria will decrease by about NO.003821 However, the coefficient of total labour force is not statistically significant, while the coefficients of gross fixed capital formation and gross fixed capital formation are statistically significant

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4.1.1 Result of Vector Error Correction Model (VECM)

Table 4: Vector Error Correction Estimates

When non-stationary variables are found to be cointegrated, the conventional wisdom is to estimate an error correction model (Engle and Granger, 1987). This shows the short run response of the economic growth to changes in the explanatory variables. It includes the speed of adjustment to equilibrium when the short run position of the economic growth deviates from the long run position.

The result of vector error correction estimates presented in table 4 shows that the t-value associated with the coefficients of the lag value of labour force, gross fixed capital formation, foreign direct investment and oil price are statistically insignificant when per capita real GDP is taken as a dependent variable. But the coefficient of openness to trade is statistically significant. The VECM results also indicate that both per capita GDP and openness to trade are the two variables that adjust the disturbances to restore long-run equilibrium significantly and in right direction. The coefficient of error correction term (ECT) -2.986191 for per capita GDP and (ECT) -11.13988 trade openness which suggests the speed

Table 5. Variance Decomposition Test.

Period	S.E.	LNRPCGDP	LNLABF	GCF	FDI	OILP	OPEN
1	0.046951	100	0	0	0	0	0
2	0.050121	93.96249	0.951236	0.113599	0.250774	4.154588	0.567308
3	0.061341	81.58639	7.496084	0.309585	6.783674	2.795878	1.028391
4	0.070717	64.05288	7.526392	0.562001	13.70188	13.32493	0.831917
5	0.083489	47.71542	7.93639	2.308262	20.38561	20.33215	1.322164
6	0.096514	35.84069	16.37232	4.734528	17.20273	23.32923	2.520496
7	0.111592	26.89607	21.91927	6.146688	15.67225	25.76382	3.601899
8	0.125942	21.84201	25.19479	6.252749	13.62234	28.6479	4.440217
9	0.140075	17.86079	27.62852	6.625543	12.74087	30.34925	4.795029
10	0.156205	15.25893	29.22315	6.952295	11.41811	31.87718	5.27034

Source: author's computation from eviews

Table 6. Granger Causality.

Null Hypothesis:	Obs	F-Statistic	Prob.	Decision
LNLABF does not Granger Cause GCF LNRPCGDP	32	0.24101	0.7875	no-causality
LNRPCGDP does not Granger Cause LNLABF		0.75661	0.4789	no-causality
GCF does not Granger Cause LNRPCGDP	32	6.83341	0.004	causality
LNRPCGDP does not Granger Cause GCF		0.99189	0.384	no-causality
FDI does not Granger Cause LNRPCGDP	32	4.68283	0.018	causality
LNRPCGDP does not Granger Cause FDI		0.08142	0.922	no-causality
OILP does not Granger Cause LNRPCGDP	32	2.9297	0.0706	no-causality
LNRPCGDP does not Granger Cause OILP		2.12931	0.1385	no-causality
OPEN does not Granger Cause LNRPCGDP	32	0.01605	0.9841	no-causality
LNRPCGDP does not Granger Cause OPEN		0.04378	0.9572	no-causality
GCF does not Granger Cause LNLABF	32	0.01843	0.9818	no-causality
LNLABF does not Granger Cause GCF		0.88474	0.4245	no-causality

of adjustment to equilibrium after a shock are negative and statistically significant at 1% level. Hence, speed of adjustment towards the long-run equilibrium is approximately 3% for per capita GDP and 11% for openness to trade per year. The speed of adjustment is low suggesting that if there is disequilibrium, it will take time for the equilibrium to be restored

Table 5: The Variance Decomposition Result

From the table computed above, in the 1 year the CGDP has 100.0000 of total variations of itself, While in the same year the independent variables or explanatory variables was 0.000000 of the total variations in CGDP.

In the 10 year CGPD amounted for 15.25893 of total variations of itself, LABF amounted for 29.22315 of total variations in CGDP. It also shows that LABF has a huge effect on economic growth; GCF amounted for 6.952295 of total variations in CGDP, FDI amounted for 11.41811 of total variations in CGDP and is another factor driving economic growth. OILP amounted for 31.87718 of total variations in CGDP and is the major driver of economic growth in Nigeria due to over reliance by the country; this is where the concept of "DUTCH DISEASE" was generated. Finally, OPEN amounted for 5.270340 of total variation in CGDP.

From the result of the Granger causality test presented in table 6, we fail to accept the null hypothesis that there is no causal relationship between labour and economic growth, and accepted that there is a causal relationship between labour and economic growth in Nigeria. The causality is running from labour to economic growth. Thus, labour is causing changes in economic growth in Nigeria. Also, there is a causal relationship between economic growth and capital in Nigeria, and capital is causing changes in economic growth in Nigeria. Regarding the causal relationship between capita and labour, the granger causality result shows that there is a causal relationship between labour and capital in Nigeria, and that it labour that is causing changes in economic growth in Nigeria.

5. Summary and Conclusion

Motivated by determinants of economic growth in Nigeria, this study examines the factors driving economic growth in Nigeria from the period of 1981-2014 using Cobb-Douglas production function to derive our model for this study by incorporating an additional variable (foreign direct investment). We used the Johansen co-integration and VECM analysis technique to test for the existence of co-integration between the variables of this study and causal impacts. This study found that there is three co-integration equation, which means that there is a long run relationship between the variables of this study. The normalized long run relationship shows that there is a positive relationship between foreign direct investment, labour force and economic growth in the long run. But, gross capital formation is found to be negatively related to economic growth measured by the per capita GDP which is a negation of the expectation of economic theory. The result of vector error showed that the coefficients of the lag value of labour force; gross fixed capital formation, foreign direct investment and oil price are statistically insignificant when per capita real GDP is taken as a dependent variable. But the coefficient of openness to trade is statistically significant. The VECM results also indicate that both per capita GDP and openness to trade are the two variables that adjust the disturbances to restore long-run equilibrium significantly and in right direction. From the result of the Granger causality test we failed to accept the null hypothesis that there is no causal relationship between labour and economic growth, and accepted that there is a causal relationship between labour and economic growth in Nigeria. The causality is running from labour to economic growth. Thus, labour is causing changes in economic growth in Nigeria. Also, there is a causal relationship between economic growth and capital in Nigeria, and capital is causing changes in economic growth in Nigeria. Regarding the causal relationship between capita and labour, the granger causality result shows that there is a causal relationship between labour

and capital in Nigeria, and that it labour that is causing changes in economic growth in Nigeria. Since we discovered in this study that labour force drive output growth in Nigeria, policy makers should adopt policies that will help increase labour so that there will be increase in economic growth in Nigeria. The government should set a sound and fertile environment in order to foster labour output that will help to increase the level of economic growth in Nigeria. The government should use expansionary monetary and fiscal policies that reposition the structure of Nigerian economy to revive economic activities in the economy which will help rise both labour and capital for increased growth rate. This would enable the nation to adopt strategies on balance growth which will help to achieve the growth targets set by the budget

Reference

- Alfaro, L., C. Areendam, S. Kalemli-Ozcan, and S. Sayek (2004). and economic growth: The role of the financial markets”, *Journal of International Economics*. 64: 89-112.
- Ajide K.B. and O. Adeniyi (2010). FDI and the Environment in Developing Economies: Evidence from Nigeria. *Environmental Research Journal*, 4(4), 291-297. (2010).
- Ang, J. (2008). “A Survey of Recent Developments in the Literature of Finance and Growth”, *Journal of Economic Surveys*. 22: 536-576.
- Ayal, E.B. and G Karras (1998). “Components of Economic Freedom and Growth: An empirical Study”. *The Journal of Developing Areas* 32 (spring); 327-338.
- Balasubramanyam, V.N., S. Mohammed, and D. Sapsford (1996). “FDI and growth in EP and IS countries”, *Economic Journal*. 106: 92-105.
- Bengoa, M., & Sanchez-Robles (2003). “Foreign Direct Investment, Economic Freedom and Growth: New evidence from Latin America” *European Journal of Political Economy* 19: 529-45.
- Blomstrom, M., R. Lipsey. and M. Zejan (1992). “What explains developing country growth?” NBER Working Paper, n. 4132. Cambridge, Mass.
- Borensztein, E. J., J.W. De Gregorio, and J.W. Lee (1998). “How does FDI affect economic growth?”, *Journal of International Economics*. 45:5, 115- 135.
- Carlsson, F., and S. Lundstrom (2001). “Economic freedom and growth: Decomposing the effects”. *Public Choice* 112, 335—344.
- Central Bank of Nigeria (2010). Annual Report, 2010. Cheung, Y.W., and K. S. Lai (1995). Lag order and critical values of a modified Dickey-Fuller test. *Oxford Bulletin of Economics and Statistics*. 57:411-419.
- De Haan, J, S. Lundstrom, S and J.E. Sturm (2006). “Market-Oriented Institutions and Policies and Economic Growth: A Critical Survey”. *Journal of Economic Surveys* 20(2): 157-191.
- De Mello, L.R. (1997). “Foreign Direct Investment in Developing Countries and Growth: A Selective Survey”, *Journal of Development Studies*, 34: 1-34.
- Durham, J.B. (2004). “Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth”, *European Economic Review*. 48: 285-306.
- Dutt A.K. (1997). “The Pattern of Foreign Direct Investment and Economic Growth, *World Development*, 25(11): 1925-1936.
- Fry, Maxwell J (1993). “FDI in a Macroeconomic Framework: Finance, Efficiency, Incentives, and Distortions”. Policy Research Working Washington, DC. World Bank, papers No. 1141.
- Gwartney, James, Lawson, Robert, & Hall, Joshua (2011). “Economic Freedom of the World. Fraser Institute.
- Heckelman, J., and M. Stroup. (2000). Which economic freedoms contribute to growth? *Kyklos* 53:527-544.
- Hermes, N. and R. Lensink (2003). “Foreign direct investment, financial development and economic growth”, *Journal of Development Studies*. 40:142-153.
- Javorcik, B., (2004). “The composition of foreign direct investment and protection of intellectual property rights: evidence from transition economies”. *European Economic Review* 48:39-62.
- Kapur, V. (2007). “Economic Freedom and Foreign Direct Investment in Developing Countries,” *The Journal of Developing Areas*, 41(1):143- 154.
- Konings, J. (2001). The effect of foreign direct investment on domestic firms: evidence from firm level panel data in emerging economies. *Economics of Transition* 9: 619-633.
- Levina, O. (2011). “FDI, Economic Freedom and Growth. Being an unpublished MA, Department of Economics, Central European University.
- Lumbila, K.N. (2005). “What makes FDI Work? A Panel Analysis of the Growth Effect of FDI in Africa”. *Africa Region Working Paper Series* No. 80.
- Ndikumana L, and S. Verick (2008). “The Linkages between FDI and Domestic Investment: Unravelling the Developmental Impact of Foreign Direct Investment in Sub-Saharan Africa”. *IZA Working Paper* No. 3296.
- N'Zue, F.F. (2011). “Economic Freedom and Performance in ECOWAS Countries: A Dynamic Panel Data Approach”. *Africa Journal of Economic Policy*. Vol 18(2):28-53.
- Pourshahabi, F, D. Mahmoudinia and E. S. Sodeijani (2011). “FDI, Human Capital, Economic Freedom and Growth in OECD Countries”. *Research Journal of International Studies - Issue* 19 (June., 2011).
- Rivera-Batiz, F.L. (2004). “Democracy, Governance and Economic Growth: Theory and Evidence”. Working Paper, Colombia University.
- Solow, R.M. (1956)., “A Contribution to the Theory of Economic Growth” *The Quarterly Journal of Economics*, Vol. 70, No. 1. (Feb., 1956), 65- 94.
- Sylwester, K (2005). “Foreign Direct Investment, Growth, and Income Inequality in Less Developed Countries”, *Inter. Rev. Appl. Econ.* 19(3): 289-300.
- UNCTAD (1999). “The impact of FDI on growth: An econometric test” *World Investment Report*, chapter 11 (Annex), 329-343.
- World development Indicators (2012). *Regional Highlights World Development Indicators* 2012.
- Zukowska-Gagelmann, K., (2002). *Productivity Spillovers From Foreign Direct Investment. Economic Systems* 3:223-256.