Valley International Journals
Open Access Journal
VIJ
New Thinking New Innovation

The International Journal of Social Sciences and Humanities Invention
Volume 1 issue 1 2014 page no.36-50 ISSN: ***2349-2031***

Empirical Analysis of Trade Opennes, Capital Formation, FDI, and Economic Growth: Nigeria Experience.

Adegboyega Soliu B[1] and Odusanya Ibrahim A[2]

Department of Economics, Olabisi Onabanjo University Ago-Iwoye, Ogun State

Email: adegboyegasoliu2010@gmail.com[1]

ibrahim_odusanya@yahoo.co.uk[2]

Corresponding Author:adegboyegasoliu2010@gmail.com[1] (Nigeria)

Abstract

The nexus of foreign direct investments (FDI), trade openness, capital formation in promoting economic growth has been the subject of much debate among development specialists, researchers, aid donors as well as recipients in Nigeria in particular. In spite of this, there are only few empirical studies that investigate the nexus of foreign direct investments (FDI) trade openness, capital formation to economic growth rate in Nigeria. Theoretically, the nexus between trade openness, foreign direct investment (FDI), capital formation, and economic growth tends to be positive. However, this paper tries to examine the nexus between trade openness, foreign direct investment (FDI), capital formation, and economic growth rate in Nigeria which spanned over a period of 25 years (i.e.1986 – 2011), using time series data analysis. The stationarity tests were conducted since time series data are assumed to produce spurious outcome (see Granger and Newbold, 1974). Hence, all variables of interest were tested using ADF and PP unit root test, and they were all found to be stationary at first differencing. Perhaps, the Johansen-Juselius procedure is applied to establish the co-integrating relation between variables of interest. Subsequently, the result of the study show a long-run equilibrium relationship of gross domestic growth rate and the explanatory variables. The study shows a significant positive effect between the degree of trade openness, level of capital formation while a positive but insignificant relationship exist between the volume of FDI and gross domestic product growth rate. Thus to capture the short run dynamics of the study vector error correction model (VECM) was estimated. It was recommended that the Nigeria government should increase the efficacy of its fiscal and monetary policies to increase more on its exports as well as rates of GDP growth. However, the government should critically look into its institutional frame work since the positive but insignificant of the volume of FDI on economic growth, signifies as greater dilemma to the economy. Therefore, should formulate FDI-led polices and ensure higher degree of capital formation to enhance her economic growth rates at large.

Keywords: Capital formation, Trade openness, FDI, GDP growth rate, Co-integration, Nigeria

1. INTRODUCTION

To establish various ways through which trade openness, capital formation, foreign direct investment (FDI), economics growth were been attracted; policy often suggest that certain exogenous factors such as stability and efficient macroeconomic environment are essential. According to the theoretical submission, the nexus between the trade openness, capital formation,

foreign direct investment, and economic growth tend to be positive.

Besides, the neoclassical and endogenous growth theories underline that FDI promotes economic growth in a capital scarce economy by increasing volume as well as efficiency of physical investment (Romer 1986, Lucas 1988, Grosman & Helpman 1991, Baro & Salai-I-Martin 1995).On the other hand, foreign direct investment gives long-term capital with new technologies, managerial know-how and marketing capacities which in turns augment economic growth by creating employment, increasing managerial skills, diffusing technologies and fostering innovations (Asiedu 2002). Inaddition, Pugel (2007) reports that FDI increases technological spillover benefits, widens the scope of international competition and strengthens the supply side capabilities of a host country for producing and selling goods and services, which lead to higher economic growth.

In addition, the degree/level of trade openness also indicates the degree of comparative advantage of a country in undertaking investment. This view basically rests on the 'transaction cost theory' (Coase 1937, Williamson 1975) that postulates a low transaction cost environment generates financial incentives (higher return on investment) for both the domestic and foreign players in supplying large irreversible investment like FDI. Moreover, the endogenous growth theories stress that a more open trade policy framework promotes allocative efficiency of investment by reorienting factors of production to sectors that have comparative advantages in trade; thereby augmenting economic growth (Solow 1956, Balasubramanyam et al. 1996). Edwards (1992) also points out that a country with a higher degree of economic openness can grow faster by absorbing new technologies at a faster rate than a country with a lower degree of openness.

Considering the level of capital formation, which is likely to influence FDI and economic growth as well. Neo-classical growth model postulates that developing economies that have a lower initial level of capital stock tend to have higher marginal rate of returns (productivity) and growth rates if adequate capital stock is injected. In other words, in a capital shortage economy, the marginal productivity of investment is increased in the short-run when additional capital is injected in the form of long-term investment like FDI, and this increased productivity influences economic growth in the long-run.

In summary, FDI channels much needed capital for investment and provides support to capital formation; trade openness facilitates the flows of international capital and redirects factor endowments to more productive sectors; a high level of capital formation ensures needed finance for the industries growth and development; and all of them jointly promote economic growth at large. Indeed, the nexus between FDI, trade openness, and economic growth ought to be positive; also that all the variables to be cointegrated in the long-run.

Thus,for the Nigeria economy to benefited most from the FDI in order to accelerate economic growth. The country put forth the Structural Adjustment Programme of 1986 to promote and facilitate private investment both from domestic and overseas sources. However, given her natural resource base and large market size, qualifies her to be a major recipient of FDI in Africa and indeed is one of the top three leading African countries that consistently received FDI in the past decade.

This paper attempts to contribute to the existing literature by considering the country since it had been amongst and indeed have what it takes to attract FDI. Also, the study further, uses time series data that spanned between 1986 – 2011, which marked the period of economic, globalisation and financial liberalization measures undertaken by the government to attract FDI. In

addition, as part of measure to fill the gap in other study by considering capital formation as a measure of gross fixed capital formation over the gross domestic product which was not considered in earlier study due to the paucity of data on capital formation for the Nigeria economy.

The remainder of the study is organized as follows: Section 2 provides theoretical underpinnings and surveys the related literature of the linkage between FDI, trade openness, capital formation, and economic growth. Section 3 describes the methodology which includes variables, description and sources of data; and empirical design.. Section 4 reports the empirical results and findings, and finally, section 5 provides the summary and conclusion for the study.

2. THEORETICAL AND RELATED LITERATURE

The theoretical foundation for FDI led economic growth hypothesis of a country could be traced to the work of the neoclassical, endogenous growth models and the dependency theorist. These three schools had view these theories from different perspective.

From the Neoclassical perspectives, FDI was seen as having the power that can help to channel the required funds to the productive sectors of a capital shortage economy which, in turn, help increase the economic growth rate by increasing the marginal productivity of capital. In other words, the neoclassical perspective is based on a basic principle in economics that outlines economic growth demands capital investment in the form of long-term commitment (Adams 2009).

On the other hand, the endogenous growth theories state that the long-run growth of a country is not only influenced by the volume of physical investment but also depends on the efficiency of utilizing investment. Therefore, endogenous growth model focuses on incorporating organizational, managerial, technical and human skills, innovation and technological progress, and accumulation of knowledge endogenously in the growth theories that are often brought by FDI (Romer 1986, Lucas 1988, Mankiw et al. 1992, Pugel 2007). Precisely, in the endogenous growth model, the long-run economic growth is viewed as a function of technological progress deriving from technology transfers and knowledge spillovers (Grossman and Helpman 1991, Romer 1994, Nair–Reichert and Weinhold 2001). For instance, the study of the United Nations Conference on Trade and Development (UNCTAD) in 1992 that examines the FDI led growth hypothesis in developing economies. The study unearths that FDI creates a positive effect on employment, human skills and international trade, beside the economic growth rates, for China and Taiwan. Aluko (1961), Brown (1962) and Obinna (1983) report positive linkages between FDI and economic growth in Nigeria. Endozien (1968) discusses the linkage effects of FDI on the Nigerian economy and submits that these have not been considerable and that the broad linkage effects were lower than the Chenery–Watanabe average (Chenery and Watanabe,1958).

Oseghale and Amonkhienan (1987) found that FDI is positively associated with GDP, concluding that greater inflow of FDI will spell a better economic performance for the country. Ariyo (1998) studied the investment trend and its impact on Nigeria's economic growth over the years. He found that only private domestic investment consistently contributed to raising GDP growth rates during the period considered (1970–1995). Akinlo (2004) found that foreign capital has a small and not statistically significant effect on economic growth in Nigeria. However, these studies did not control for the fact that most of the FDI was concentrated in the extractive industry. In other words, it could be put that these works assessed the impact of investment in extractive

industry (oil and natural resources) on Nigeria's economic growth.

Onakoya (2012) investigate the impact of FDI on economic growth in Nigeria. His finding show that FDI has a significant impact on output of the economy but that the growth effects of FDI differ across sectors. In his study, three-stage least square (3SLS) techniques and macro-econometric model of simultaneous equation was used to capture the disaggregated impact of FDI on the different sector of the economy. In a related scenario, Saibu (.....) when examining capital flows, trade openness, and economic growth in Nigeria. The study finds statistically significant effect of capital flows and trade openness on economic growth in Nigeria. Thus, the outcome of his results could be ascribed to the composite indicator derived from principal component analysis (PCA) in the Autoregressive Distribution Lag (ARDL) bound testing model employed in his study. Some studies find positive spillover effects (Blomstrom et al., 2000; Sjohlomn, 1999), others find no effects and some even conclude that there are negative effects (Aitken and Harrison, 1999). At equilibrium, the literature agrees that the positive effects of FDI tend to outweigh the negative effects (Lim,2001; Klein et. al., 2001).

Lastly, the theories of FDI was dependency theorists who argue that dependence on foreign

Investment tends to create a negative impact on economic growth and income distribution. The underlying assumption behind the dependency theory is that an economy controlled by foreigners does not develop organically rather grows in a disarticulated manner (Amin 1974). This happens because of the multiplier effect which shows that the demand elasticity between two sectors is less than unitary, thereby directing to stagnant growth rates in the developing countries (Adams 2009). The dependency theories also argue that foreign gigantic players may create negative effect on the growth and development of domestic firms' of a host country in the long-run as they have large volume of capital, superior technologies, higher market access, advanced marketing networks and better managerial and human relation skills (Marksun & Venables 1997, Agosin &Mayer 2000,

Kumar & Pradhan 2002). Thus, dependency theories argue that FDI is not an aid to the development rather it undermines the process of development (Razin et al. 1999). For instance, following the work of Akinlo (2003) which submit that foreign capital was not statistically related to economic growth in Nigeria. This however corroborates with the study conducted by Ogiogio (1995) which identifies a negative contributions of public investment as an accounting for distortions to GDP growth in the country.

Perhaps, empirically the nexus between trade openness and the economic growth, a more conclusive views is found with respect to the capital accumulation and economic growth. Both the classical and neo-classical growth model postulates that capital is nucleus to economic growth, which by implication, if there is no capital, there is no investment; and subsequently, no growth. The rationale to this argument is that capital accumulation helps expand productive capacity of different economic sectors by increasing number of firms. When a number of firms engage into production or business activities, internal resources of a country are better utilized through increasing competition and efficiency. As a result, the productivity of factor endowments is increased and a low production cost can be achieved through greater economies of scale as well as standardization of products. Precisely, capital accumulation helps increase investment, investment creates employment through expanding production bases, additional employment generates higher savings which provide confidence in undertaking larger

investment, and this chain effect ultimately influences economic returns positively. In tune with this, the proponents of endogenous growth theories argue that FDI can play a substantial role in building capital formation by increasing funds and supplying of needed technology and skills, which, in general, promote economic growth.

There has been various submission that trade openness can create room for technological progress, brings about efficient allocation of inputs resources; and absorption capability which will lead them to grow more rapidly and therefore, influence their economic growth more rapidly than a country with lower degree of trade openness (Solow (1957), Grossman & Helpman (1991), and Barro & Sala-I-Martin (1995). However, Edwards (1998) argues that the equilibrium rate of growth in the poorer countries does not solely depend on openness rather on its initial stock of knowledge and the cost of imitations. Edwards (1998) also argues that if the imitation cost of innovation in the poorer countries becomes lower than the cost of innovation in technologically advanced economies, the poorer countries will grow faster than the advanced one, and there will be a tendency towards convergence. This hypothesis basically complements the transaction cost theory that postulates market for intermediary products are usually imperfect, and firms, as an economic agent, need to incur certain costs to complete a transaction. Importantly, this transaction cost can be minimized when markets are integrated both at the national and international levels through greater openness, or in particular, through free trade. Perhaps, counter arguments of the positive link between trade openness and economic growth can also be foundnin empirical literature. For instance, Rodrik (1992) reports that economic openness may bring macroeconomic instability by increasing inflation, depreciating exchange rates and inviting balance of payment crisis. Similarly, Levine & Renelt (1992), and Andriamananjara & Nash (1997) report that a high degree of trade openness may increase inflation and lower the real exchange rates which may create negative impact on domestic investment.

In empirical analysis, Kormendi & Meguire (1985), Barro (1991), Levine and Renalt (1992) conclude that the rate of physical capital formation influences the rate of a country's economic growth. In contrast, Kendrick (1993) notes that the formation of capital alone does not lead to economic prosperity, rather the efficiency in allocating capital from less productive to more productive sectors influences economic growth. On the other hand, Ghali & Al-Mutawa (1999) apply time series analysis on G-7 countries and report that the causality between fixed investment (capital formation) and economic growth is country specific and may run in both directions.

Some divergent view on trade openness, FDI, capital formation and economic growth in Nigeria include: Anyanwu (1998) noted that the FDI in Nigeria shows a great deal of sensitivity to changes in domestic investment, change in domestic output or market size, indigenization policy and change in the openness of the economy. Ayanwale and Bamire (2001) assess the influence of FDI on firm level productivity in Nigeria and report a positive spillover of foreign firms on domestic firm's productivity. Adeolu (2007) opined that FDI in Nigeria contributes positively to economic growth. Although the overall effect of FDI on economic growth may not be significant, the components of FDI do have a positive impact. He posited that FDI in the communication sector has the highest potential to grow the economy and is in multiples of that of the oil sector. The manufacturing sector FDI negatively affects the economy, reflecting the poor business environment in the country. The level of available human capital is low and there is

need for more emphasis on training to enhance its potential to contribute to economic growth. He suggested that the determinant of FDI in Nigeria is market size, infrastructure development and stable microeconomic policy. Openness to trade and available human capital, however, are not FDI inducing. He further, stated that a country inward FDI position is made up of the hosted FDI projects, while outward FDI comprises those investment projects owned abroad. He said that one of the most salient features of today's globalization drive is conscious encouragement of cross border investment especially by transnational corporations and firms (TNCS). Many countries and continents (especially developing countries) now see attracting FDI as an important element in their strategy for economic development. This is most probably because FDI is seen as an amalgamation of capital, technology, marketing and management.
Opaluwa (2012) posited that FDI has a negative effect on manufacturing productivity and is statistically significant.

Summarily, it could be concluded that empirical literature in relations to the theoretical underpinning on the nexus between trade openness, capital formation, FDI, and economic growth is in conclusive as so some are in support of positive relationship while on the other hand, some report a negative relationship and besides, some could not trace any relationship or submitted a weak relationship. As such, this difference in divergent in opinion could be trace to methodology, data selection, and analytical tools used in the analysis. Also, this could be attributed to country specific in relations to environment, institutional arrangement, economical, political settings and technological progress in the receiving country of interest of foreign direct investment.

3. METHODOLOGY

Variables

In this study, we examine the nexus between trade openness, capital formation, FDI, and economic growth in Nigeria spanning from 1986 to 2011. The variables to be employed in the study includes; real GDP, trade openness, capital formation, and foreign direct investment (FDI)

Description and Source of Data.

The main explanatory variables used in the study are presented in the table 1, with the real Gross Domestic Product as the explained variables. This is in line with a study carried out by Adhikary (2011).

Table 1

Variables	Description	Sources
Economic growth (GDPg)	This is an indicator of economic growth which is measured as a growth of gross domestic product	World Development Indicators.
Trade Openness (TRDO)	This was expressed based on Gries et al (2009) where trade openness is measured by adding import and export together and divided by GDP. i.e = (EX + IM)/GDP	CBN Statistical Bulletin
Capital Formation (CF)	This is measured as a	CBN Statistical Bulletin

	percentage of Gross Fixed Capital Formation over GDP. This is adopted by Ghali & Al-Mutawa (1999), Barro (1991).	
Foreign Direct Investment (FDI)	This is measured as a percentage of GDP	World Development Indicators.

Empirical Design

Based on the description of the variables in the table 1 above, the empirical design is based on estimating the equation in a functional form as below:

GDPg = F(TO, FDI, CF) ..... (1)

Mathematically represented as

GDPg = β0 + β1TO + β2FDI + β3CF + μt ..... (2)

However, the expected sign of the parameters are

β0, β1, β2, β3 > 0 ..... (3)

where **μ**t is the error term which is assumed to be independently and identically distributed.

However, Nelson and Plosser (1982) argue that most of the macroeconomic variables or series are non stationary at level, but stationary after first differencing. If the estimated variables are non stationary, the regression result with these non stationary variables will be spurious (Granger and Newbold 1974). In addition, Asteriou and Hall (2007) noted that most of macroeconomic time series are trended and therefore in most cases are non stationary. It is therefore necessary to determine the stationarity and order of integration of each series of the variables to avoid spurious regression phenomenon. Also, the time series property of each variable is investigated under a univariate analysis by implementing the ADF (Augmented Dickey- Fuller) test for the unit root (nonstationarity) (following Dickey and Fuller 1981, Fuller 1996). Likewise, the PP (Phillips-Perron) test is also implemented (following Phillips 1986, Phillips & Perron 1988, Perron 1989).

Perhaps, if these tests confirm stationarity in time series data at level, equation 2 above is estimated using Ordinary Least Squares (OLS) Method, but if not, the tests is further subjected the general form of Augumented Dickey Fuller (ADF) test of the following regression equation to test for the unit root in the series

$$\Delta Yt = \beta 0 + \beta 1 Yt\text{-}1 + \sum^{n}_{i=1} \Delta Yi + \mu t \quad \text{..... (4)}$$

$$\Delta Yt = \beta 0 + \beta 1 Yt\text{-}1 + \sum^{n}_{i=1} \Delta Yi + £ + \mu t \quad \text{..... (5)}$$

Where: equation 4 and 5 implies ADF with and without a deterministic trend respectively.

Δ is first difference operator, Y is the trend series, t is a linear time trend

N is the optimum number of lags in the dependent variables.

μt is a random error term.

To further establish the otherwise of equation 2 the Phillips Perron (PP) tests is thus conducted. Thereby represented as:

$\Delta Yt = \beta 0 + \beta 1 Yt\text{-}1 + \mu t$ ..... (6)

In summary, if in the event of testing for stationarity of each variable, it was found that the variables are of the same order. Then the concept of cointegration is necessaitated, therefore, the cointegration relationship among variables is studied by the Johansen-Juselius procedure (Johansen 1988. Johansen-Juselius 1999) guide against the associated problem of spurious correlation and misleading. The kernel behind cointegration is that if two or more series move together in the long-run, even though the series themselves are trended, the difference between them is stationary, and it is possible to regard these series to have a long-run equilibrium relationship. For cointegration, however, all the variables must be in the same order of integration or depiction of I(d) behaviour.

With all the variables exhibiting the same order of integration, it is then imperative to estimate the Vector Autoregressive (VAR) (see Granger (1988). The appropriate lag-length (p) is selected with the aid of the FPE (Final Prediction Error) criterion (Akaike 1969) to ensure that errors are white noise. Perhaps, on the evidence of cointegrating relationship, a vector error-correction model (VECM) is estimated to model the long-run causality and short-term dynamics. The purpose of VECM model is to indicate the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The greater the coefficient of the parameter, the higher is the speed of adjustment of the model from the short-run to the long-run. Therefore, the VECM to estimate is:

$\Delta Yt = \beta 0 + \sum^{n}_{i=1} \beta 1 \Delta Yt\text{-}1 + \sum^{n}_{i=1} \beta 2\ \Delta TOt\text{-}1 + \sum^{n}_{i=1} \beta 3 \Delta FDIt\text{-}1 + \sum^{n}_{i=1} \beta 4 \Delta CFt\text{-}1 + ECMt\text{-}1 + \mu t$ ... (7)

Above it all, the decision criteria to judge the extent of convergence from the short run to the long-run is subject to, if the parameter of error correction term is negative and statistically significant in terms of its associated-*t* value. Therefore, indicates unidirectional long-run causal flows from changes in FDI, capital formation and openness to GDP growth in Nigeria as well as long-run convergence. On the other hand, if the parameters of the error correction term is positive and statistically significant, still there exists a long-run causality but with a divergence.

4. EMPIRICAL RESULT AND FINDINGS

Subsequently to our empirical design stated above, the following results were obtained.

4.1: Unit Root Results

Table 2: Stationarity Unit root tests (ADF)

	Level		First Difference	
Variables	Constant	Constant and Trend	Constant	Constant and Trend
CF	-2.386	-2.009	-4.841**	-5.295**
FDI	-4.684**	-4.597**	-6.000**	-7.669**
TRDO	-4.501**	-4.445**	-4.517**	-3.863**
GDPg	-1.614	-2.234	-5.645**	-5.566**

*Where: variables are in fractions form The Mickinnon (1996) critical value are -4.394 and -3.243 at 1 percent and 10 percent respectively. ** represent 1 percent significant level and * represent 10 percent significant level.*

Table 3: Stationarity Unit root tests (PP)

	Level		First Difference	
Variables	Constant	Constant and Trend	Constant	Constant and Trend
CF	-2.357	-1.956	-5.794**	-5.564**
FDI	-4.684**	-4.600**	-7.801**	-7.669**
TRDO	-4.600**	-4.445**	-8.1745**	-8.076**
GDPg	-3.152**	-3.403*	-7.421**	-7.102**

*Where: variables are in fractions form The Mickinnon (1996) critical value are -4.394 and -3.243 at 1 percent and 10 percent respectively. ** represent 1 percent significant level and * represent 10 percent significant level.*

From table 2 and 3 above, which represented the outcome of the unit root tests conducted on the platform of ADF and PP. As such, all the variables have been differenced once to check their stationarity. At first differencing, the calculated ADF and PP tests statistics clearly reject the null hypothesis of unit root at the 1 per cent and 10 per cent significance levels when compared with their corresponding critical values.

Clearly, the ADF and PP tests decisively confirm stationarity of each variable at first differencing under both constant and constant plus trend level, and depict the same order of integration, i.e. integration of order One {I(1)}.

It was on the note that the Johansen-Juselius procedure is implemented as stated in the section above to detect the cointegrating relationship among variables of interest in the study.

4.2: Co-integration Results

Table 4: Johansen Hypothesized Co-integration Relations

Panel (a)

Null Alternative	Eigen Value	Trace Statistic	5 percent Critical Value	P-Value**	Max-Eigen Statistic	5 percent Critical Value	P-Value**
r = 0*	0.7639	92.8526	47.85613	0.0000	34.6519	27.58434	0.0052
r ≤ 1*	0.7448	58.2007	29.79707	0.0000	32.7823	21.13162	0.0008
r ≤ 2*	0.5840	25.4183	15.49471	0.0012	21.0505	14.26460	0.0036
r ≤ 3*	0.1664	4.3679	3.841466	0.0366	4.3679	3.841466	0.0366

Notes: Both trace test and max-eigen test statistic indicates four cointegrating equations @ 5 per cent
**denotes rejection of the hypothesis at the 0.005 level*
***Mackinnon-Haug-Michelis (1999) p-values*

Panel (b): Estimates of co-integrating vector

Normalized co-integrating coefficient

GDPg	CF	FDI	TRDO
1.0000	67.375		
	0.5740	0.2911	
	(18.4021)	(5.39174)	
		(0.31002)	

The values in parenthesis are the t ratio

From table 4 above, the table presents the result of Johansen co-integration test both for the trace and maximum eigen value statistics. Accordingly, the trace statistics and maximum eigenvalue statistics

detect four cointegrating relationship at the 5% level with the probability of 1 percent in panel (a). In essence, these tests indicate the presence of a long-run equilibrium relationship among variables of interest in the study. Moreso, panel (b) show that there exist a long run relationship among the variable in relations to the GDP growth rate (i.e capital formation,, trade openness and foreign direct investment). Interestingly, though all was in line with the thereotical underpinning, but only capital formation (CF) and trade openness TRDO) were statistically significant while foreign direct investment though positive but statistically insignificant.

Table 5. Estimated vector error correction model.

Error Correction:	D(GDPG)	D(CF)	D(FDI)	D(TRDO)
Ecm(-1)	-0.527433	-0.000759	0.100668	0.015667
	[-2.45025]	[-0.50338]	[0.69557]	[1.76301]
D(GDPG(-1))	0.064414	-0.000115	0.180394	-0.004156
	[0.28821]	[-0.07364]	[1.20051]	[-0.45042]
D(CF(-1))	4.115961	-0.014667	-38.76031	-2.759248
	[0.10425]	[-0.05305]	[-1.46011]	[-1.69283]
D(FDI(-1))	0.491168	0.001431	-0.468495	-0.008887
	[1.50077]	[0.62454]	[-2.12912]	[-0.65781]
D(TRDO(-1))	5.842187	0.016853	-4.534376	-0.639981
	[1.13521]	[0.46764]	[-1.31047]	[-3.01231]
C	0.210602	-0.001587	0.033953	0.013954
	[0.32790]	[-0.35296]	[0.07863]	[0.526290]
Adj. R-squared	0.221155	-0.197225	0.220888	0.206128
F-statistic	2.306185	0.242217	2.304159	2.194388
Log likelihood	-57.76862	61.30683	-48.24088	18.72698

Figures in parenthesis are t statistics

Having ascertain the order of integration to be I(1), and that they are cointegrated, the stage is set for to formulate an error correction model. The results from table 5, presents the short run component of the estimated vector error correction models (VECM). The F-Statistics suggests that the variables in the VECM explained short run variation in economic growth (GDPg), Foreign Direct Investment (FDI), and trade openness (TRDO) while capital formation (CF) do not.

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Perhaps, the ecm(-1) is negative and statistically significant in terms of its associated t-value with GDP growth rate, which implies a long run causality as well as long run convergence with (-0.527) but a negative but statistically insignificant for capital formation. On the other hand, the ecm(-1) shows a positive but insignificant for foreign direct investment, and positive and significant with trade openness

Table 6. Estimates of variance decomposition of GDP growth rates

Period	S.E	GDPg	CF	TRDO	FDI
1	**3.101632**	**100.0000**	**0.000000**	**0.000000**	**0.000000**
2	3.655566	93.90934	5.364410	0.000500	0.725752
3	4.069593	82.39887	16.84152	0.002801	0.756804
4	4.262542	76.34131	21.86506	1.092813	0.700817
5	4.492532	68.92836	28.94892	1.199868	0.922846
6	4.660822	64.14046	32.66089	2.228561	0.970093
7	4.849817	59.25421	37.18050	2.430953	1.134340
8	5.010040	55.55795	40.12888	3.109248	1.203929
9	5.178461	52.01326	43.33028	3.341891	1.314567
10	5.331769	49.08713	45.74024	3.792394	1.380233

The variance decomposition outputs are reported in table 6. It was documented that the variance of GDP growth rates is always caused by 100 per cent by itself in the first year. In the second year, the GDP growth rates variance is decomposed into its own variance (93.91%) followed by FDI (72.84%) and level of capital formation (5.36%). However, in subsequent years, the share of GDP growth rates decline to approximately 82% followed by the volume of FDI and degree of capital accumulation increased to (75.68% and 16.84% respectively). On the other hand, the share of trade openness in explaining the variation of GDP growth rates increases gradually from the second year, till the tenth year. Summarily, the changes in GDP growth rates is mainly caused by its own variation, which by the end of the tenth year it could accounted for below average (i.e 50%).

From figure 1 of the (Appendix) presented the impulse response in the GDP growth rate to the foreign direct investment (FDI), trade openness (TRDO), and capital formation (CF) in the Nigeria context for the post-SAP era. Figure 1(A) presented the response of FDI to GDP growth rate which reveal that it was only favourable in the second eriod but negative in all other period, thus this have a bad implication of the Nigeria economy performances. Likewise, capital formation (CF) has only contributed to GDP growth rate in the first period but decline henceforth. Indeed, figure 1(C) in appendix of trade openness response to GDP growth rates is positive and has been increasing over time.

5. SUMMARY AND CONCLUSIONS

The goal of this study is to investigate the nexus between trade openness, capital formation, FDI and economic growth rates in Nigeria by empirically analysinig the time series data spanned from 1986 – 2011 (post-SAP era).

From table 4, panel (a) above, it was revealed that the both trace statistics and max-eigen statistics value shows there exist four co-integrating equation at 5 percent probability levels; and also from panel (b), the normalised co-integrating vector coefficient shown a long run relationship between trade openness, Capital Formation, foreign direct investment and economic growth rates in Nigeria.

However, foreign direct investment shows a positive effect on the economics growth rates in Nigeria but it was insignificant. On the other hand, capital formation, trade openness also shows a positive effect on economic growth while still statistically significant.

Perhaps, this study supported the a prior expectation underpinning the relationship between trade openness, capital formation, FDI and economic growth rate. Indeed, previous study on the relationship between FDI and economic

growth in Nigeria that have shown if not statistically significant but rather positive includes (see Aluko (1961), Brown (1962), Obinna (1983), Adeolu (2007) and Onakoya (2012).

Subsequently, panel (b) shows a positive and significant relationship between capital formation and economic growth in Nigeria since the post-SAP era in the country. The results also support the study of Kormendi & Meguire (1985), Barro (1991), Levine & Renalt (1992) that report positive influence between the rate of physical capital formation and the rate of a country's economic growth. Also, positive and significant relationship exist between trade openness and economics growth in Nigeria. This result approves our theoretical linkage between them, and favours international finance and neoclassical growth theories.

Evidence based on the short-run component of the estimated Vector Error Correction Model (VECM), the associated variance decomposition,and impulse responses, revealed that the equilibrium relationship between GDP growth rate and the variables in the study were stable, exogenous shocks due to GDP growth rate is being corrected within 0.527 (approximately 2 ½ years).

From the findings above it is imperative for the Nigeria government to formulate and still improves on its export-led policy to brings about more trade balance and also, to increase the efficacy of its fiscal and monetary policies to increase its exports, create more avenue towards the capital formation as well as rates of GDP growth. Interestingly, with a great perception about the country of its great potential in absorbing FDI into the country, it shows that FDI had not really aids the economic growth in Nigeria, this might be ascribed to corruption, bad governance and decay within the Nigerian economy system. Hence, the government need to work out all its institution frame work to enhance, and monitor the inflow of the FDI so that it will reflect on the economy.

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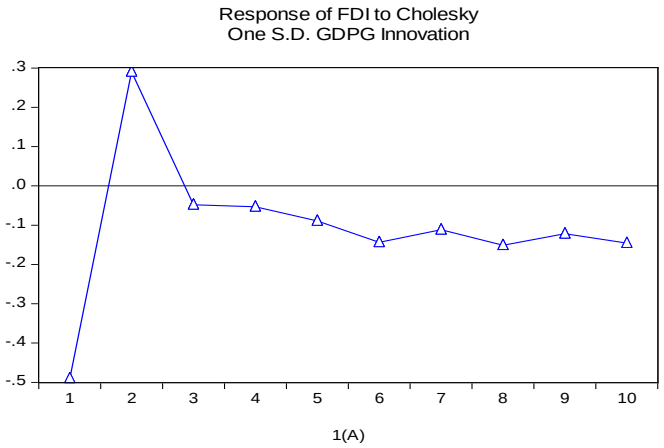

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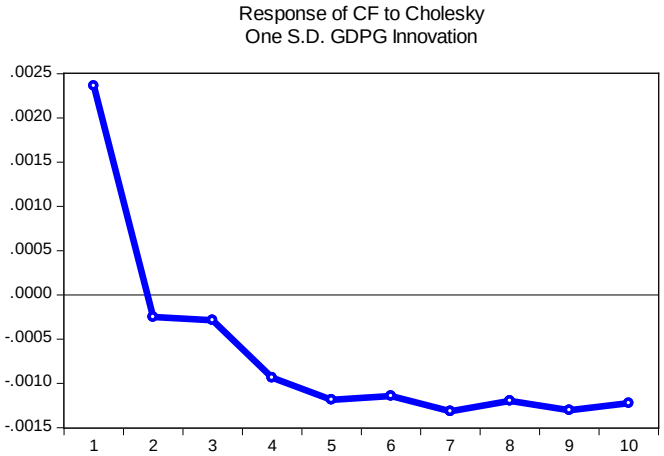

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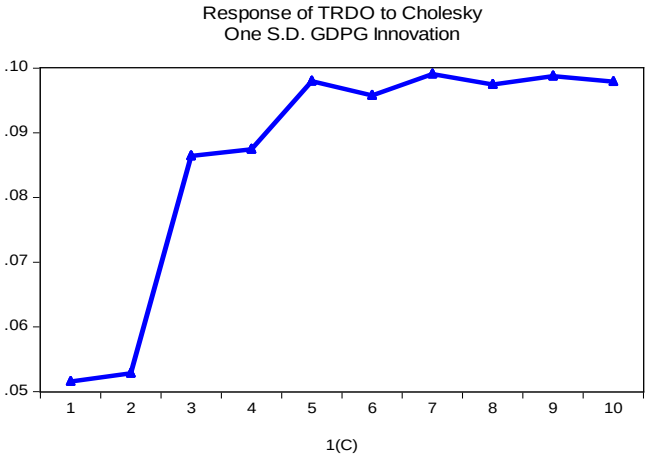
Response of TRDO to Cholesky
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