VOL. 29 NO. 7
ISSN: 2190-2099
JUNE, 2023

African Scholar Publications & Research International

African Scholars Journal of Business Dev. and Management Res. (JBDMR-7)

Capital Market and Industrial Performance Nexus: Empirical Evidence from Nigeria

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Abstract

This paper examined the causal relationship between the capital market and the performance of the industrial sector in Nigeria from 1985 to 2015. The paper derived its theoretical basis from the finance-led growth hypothesis and the endogenous growth theory. For empirical analysis, the Phillips-Perron unit root was adopted to determine the time series characteristics of the variables, while causality was examined by employing the Granger causality test approach. Findings revealed that there is a unidirectional causality running from market capitalization ratio, total value of shares traded ratio and turnover ratio to industrial performance. The paper recommends improved publicity on the strategic role of the capital market as well as a strong regulatory mechanism for its efficient and smooth operation in order to mobilise long term funds for industrial development in Nigeria.

Keywords: Capital Market, Industrial Performance, Unit Root Test, Industrial Development, Performance, Granger Causality Test and Nigeria.

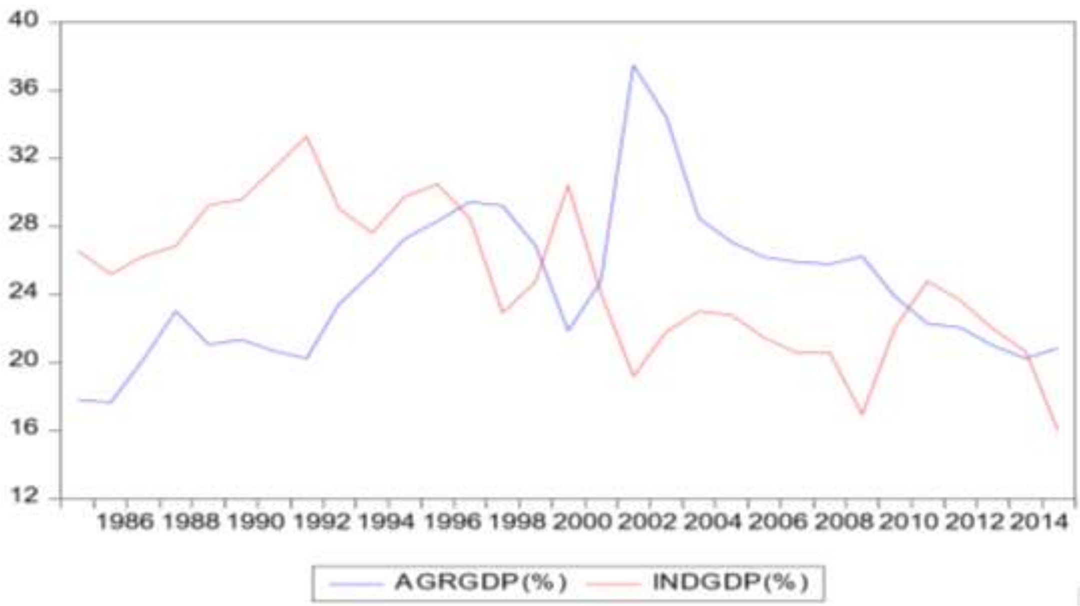
Introduction

Industrialization has been identified as a key ingredient in the growth and development process of developing countries, including Nigeria. The global development agenda emphasizes the need for industrialization as reflected in one of the United Nations Sustainable Development Goals of inclusive and sustainable industrialization (UN, 2015). Industrialization is basically concerned with the development of the capacity to transform raw materials to finished goods (Anyanwu, 1997), with a far- reaching impact on employment generation, poverty reduction, external balance, improved quality of life, high productivity and modernisation (Nyong, 2011; Todaro and Smith, 2011; Ebong, Udoh and Obafemi, 2014).

However, industrialization thrives on the foundation of key infrastructures and institutions which are built through capital formation. The capital market serves as an avenue for capital formation and mobilization (Ly, 2011). Although, there are other avenues for the mobilization of financial resources for industrial development, the capital market is believed to be more potent in the sense that it mobilises long term financial resources and diversifies risks.

Nigeria's bid to industrialize her economy has been hampered by several factors including poor infrastructure, weak institutions, inadequate capital and financial resources, etc. Such factors have resulted in an unimpressive performance of the industrial sector. For instance, the industrial sector accounted for about 25.23% of gross domestic product (GDP) in 1986, fluctuated before falling to 16.01% in 2015 (CBN, 2015). However, the industrial sector has continued to trail the agricultural sector which contributed about 20.86% to total output in 2015.

Fig.1: share of agriculture and industry in gross domestic product in Nigeria

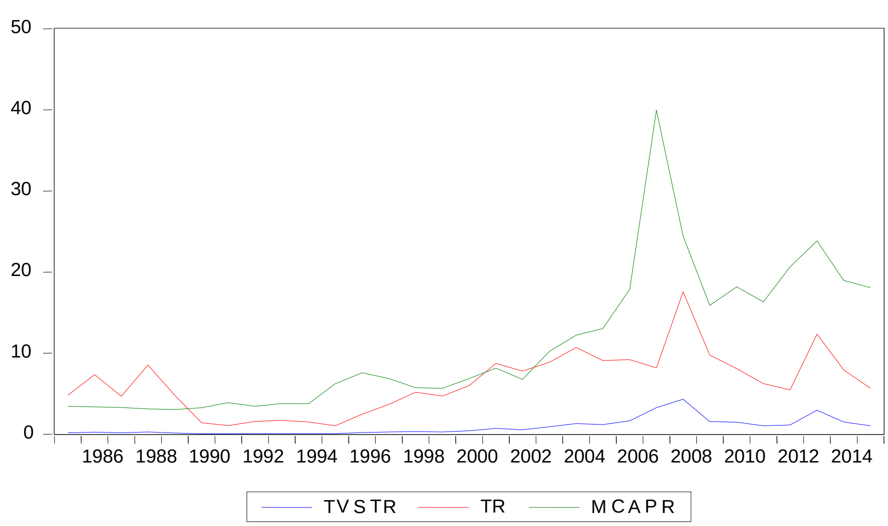


Source: Based on the data obtained from CBN Statistical Bulletin (2015)

In Nigeria, the establishment of a formal capital market dates back to 1961. Nevertheless, the market was dormant until the introduction of Structural Adjustment Programme (SAP) in 1986. The number of tradable securities increased as a result of the implementation of SAP, with much wider impact on the development of the capital market. In the post-SAP era, the market became a truly capitalist instrument for mobilizing and allocating capital funds in the process of wealth creation rather than as a vehicle for wealth distribution, as the pre-SAP activities tend to portray. Policies and strategies tended to be more market related than before. In addition, the deregulation of the foreign exchange and interest rates which were the pillars of SAP, encouraged many companies to seek for cheaper source of long term funds which only the capital market could produce (Dada, 2003).

Over the years, the capital market has shown signs of improved performance as revealed by some key stock market indices, especially during the post-SAP era. The number of listed domestic companies rose from 174 in 1993 and peaked at 215 in 2005, before plunging to 183 in 2015 (World Bank, 2015). Stock market capitalization ratio increased from 3.3% in 1986 to 18.06% in 2015. Value of shares traded ratio rose from 0.25% in 1986 to about 1.02% in 2015 (CBN, 2015). The All Share Index rose steadily from about 1, 407.4 basis points in 1985 to about 370,406 basis points in 2015 (CBN, 2015).

Fig. 2: Trend in stock market indices in Nigeria



Source: Based on the data obtained from CBN Statistical Bulletin (2015).

Surprisingly, the moderate performance of the capital market has not translated to a remarkable growth of the industrial sector. The capital market in Nigeria lacks depth and breadth, and is constrained by poor infrastructure (Dada, 2003). It is against this backdrop that this study seeks to determine if there exist any causal relationship between capital market and industrial sector performance in Nigeria. The received literature is replete with studies on capital market – economic growth nexus; Oke and Adeusi (2012), Olweny and Kimani (2011), Paramata and Gupta (2011). There exist scanty studies on capital market and industrial performance nexus. This study attempts to fill the existing knowledge gap by focusing on the causal relationship between the capital market and industrial performance using extended data points in Nigeria.
Following the introduction, the rest of this paper is organized as follows: section two reviews relevant literature. Section three dwells on the methodology. Section four presents the results and discusses the findings. Section five deals with conclusion and recommendation.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

LITERATURE REVIEW

There exists a plethora of studies and related studies on capital market - growth nexus. These studies cut across several continents. Some existing literature report a positive relationship between capital market development and growth while others show a negative relationship. However, some studies report a relationship which changes depending on short-run or long-run situation.

In Europe, Elias (2007) reviewed the literature on the finance-growth nexus within a neoclassical framework. The empirical evidence revealed that in underdeveloped and emerging countries financial development fosters aggregate investment mainly by lowering the cost of capital, while in advanced economies by raising total factor productivity.

Adamopoulos (2007) investigated the relationship between financial development and economic growth for Ireland for the period 1965-2007 using a vector error correction model (VECM). Granger causality tests indicated that there is a bilateral causal relationship between stock market development and economic growth taking into account the positive effect of industrial production growth on economic growth for Ireland.

Arav (2010) studied capital markets and economic development as a framework for newly liberalized economics. He pointed out that the confidence in the future and the confidence of the investors in this future are the sine qua non for the success of capital markets. He concluded that the role of the government in providing confidence in the capital market is pivotal to the implementation of efficient capital markets and to the propelling of economic growth.

Ayadi, Emrah, Sami and Willem (2013) explored the relationship between financial sector development and economic growth, using a sample of northern and southern Mediterranean countries for the years 1985-2009. They reported that the stock market size and liquidity play a significant role in growth, especially when accounting for the quality of an institution.

Bayar, Kaya and Mura (2014) examined the relationship between stock market development and economic growth in Turkey during the period of 1999-2013, using Johansen-Juselius cointegration test and Granger causality test. Empirical results indicated that there is a long-run relationship between economic growth and stock market capitalization, total value of stocks traded, turnover ratio of stocks traded and also there is unidirectional causality from stock market capitalization, total value of stocks traded and turnover ratio of stocks traded to economic growth.

In Asia, Choong, Yusop, Law and Liew (2005) using the bounds test approach observed that both stock market and economic growth are cointegrated in the long run with a significant positive effect in the context of Malaysia.

Paramata and Gupta (2011) undertook an empirical analysis of stock market performance and economic growth in India. They used monthly Index of Industrial Production (IIP) and quarterly by gross domestic product (GDP) data for the time span of April, 1996 to March, 2009. For the empirical analysis, they adopted unit root (ADF, PP and KPSS) tests, Granger causality test, Engle-Granger cointegration test and error correction relationship between IPP and stock prices (BSE and NSE). Quarterly results revealed that there is no relationship between GDP and BSE but in the case of NSE and GDP there is unidirectional relationship that runs from GDP to NSE. The Engle-Granger residual based cointegration test suggested that there is a long run relationship between the stock market performance and economic growth. Similarly, the results of error correction model revealed that when the long-run equilibrium deviates then the economic growth adjusts to restore equilibrium by rectifying the disequilibrium.

Regmi (2012) reported a causal relationship between stock market development and economic growth in Nepal for the period 1994-2011, using unit root test, cointegration and vector error correction models and developing NEPSE composite index as an indicator of stock market development.

Masoud and Hardaker (2014) investigated the effect of stock market development, banks development and firms growth using Saudi Arabia industrial firm-level data set for the period 1995-2013 and applying GMM, MG techniques model developed for dynamic panels. The econometric results revealed that with more development in the stock market, firms that use equity finance heavily grow faster than firms that do not. There also exists some studies on capital market-growth nexus in some African countries. In a study on capital market development and growth in sub-Saharan Africa, using Tanzania as a case study, Ziorklui (2001) maintained that introduction of high-yield government short-term treasury bills has increased the demand for treasury bills at the expense of credit to the private sector. As a result, commercial banks tend to switch a greater proportion of their deposit liabilities into treasury bills. This portfolio switching tends to crowd-out the private sector and productive activities from the capital market.

Olweny and Kimani (2011) investigated the causal relationship between stock market performance and economic growth in Kenya using quarterly secondary data for the period 2001-2010. The data was empirically analysed using the Granger causality test based on the Vector Autoregressive (VAR) model. The Johansen cointegration test was used to investigate whether the variables are cointegrated of the same order taking into account the trace statistics and the maximum Eigen-value tests. The variables were found to be cointegrated with at least one cointegrating vector. The Granger causality test revealed that the causality between economic growth and the stock market runs unilaterally or entirely in one direction.

The received literature is replete with many studies on capital market and growth relationship in Nigeria. Nyong (1997) in Oke and Adeusi (2012) developed an aggregate index of capital market development and used it to determine its relationship with long-run economic development in Nigeria. The study employed a time series data from 1970 to 1994. Four measures of capital market development ratio of market capitalization to GDP (in %), ratio of total value of transaction on the main stock exchange to GDP (in %), the value of equities transactions relative to GDP and listing were used. The four measures were combined into one overall composite index of capital market development using principal component analysis. The financial market depth was included as a control. It was found that the capital market development is negatively and significantly correlated with the long-run growth in Nigeria.

Ogboi and Oladipo (2012) studied stock market economic growth in Nigeria by adopting error correction mechanism (ECM) model and Granger causality pairwise test. The empirical result showed that there was unidirectional causality between stock market and economic growth. In addition, stock market has a negative effect on economic growth in the short run but positive effect in the long run. In a study on financial sector development and industrial production in Nigeria using time series data covering the period of 1970 to 2009 by employing aggregate production framework and autoregressive distributed lag (ARDL) cointegration technique.

Alajekwu, Ezeabasili and Nzotta (2013) studied trade openness, stock market development and economic growth in Nigeria. The ADF test revealed stationarity of the variables at first difference. The Johansen multivariate cointegration test confirms a long run cointegration relationship at 5% level of significance. In addition, the regression estimate showed that trade openness response to the relationship between stock market development and does not have significant effect on economic growth.

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Udegbunam (2002) studied openness, stock market development and industrial growth in Nigeria using annual data covering the period 1970-1997. A simple model which relates industrial output growth to openness, stock market development and a battery of control variables was specified and estimated. The empirical evidence strongly suggested that openness to world trade and stock market development are among the key determinants of industrial output growth in Nigeria.

Udoh and Ogbuagu (2012) reported a cointegration relationship between financial sector development and industrial production. Both the long-run and short-run dynamic coefficients of financial sector development variables have negative and statistically significant impact on industrial production.

Udah and Obafemi (2012) investigated empirically the impact of financial sector reforms on agricultural and manufacturing sectors in Nigeria. They adopted the variance decomposition and impulse response paradigms to test whether or not financial sector variables stimulate the growth of output in agricultural and manufacturing sectors of the Nigerian economy. The results suggested that relaxing the financial development constraints and deepening the financial sector is crucial to boost economic growth in the identified two sectors.

Idyu, Ajekwe and Korna (2013) using the Ordinary Least Squares (OLS) estimation technique showed a positive significant impact of the market capitalization on industrial sector component of the gross domestic product.

Ewetan and Ike (2014) examined the long-run and causal relationship between financial sector development and industrialisation for the period, 1981-2011 using time series data. Results from multivariate VAR and Vector Error Correction Model provide evidence of long run relationship between financial sector development and industrialization in Nigeria. Granger causality test reveals long run unidirectional causal link running from industrialization to financial sector development. They concluded that there is the urgent need for government to consolidate on past financial sector reforms to address the challenges of financial intermediation in the domestic financial sector to improve loan disbursement to the industrial sector of the Nigerian economy.

THEORETICAL FRAMEWORK

The nexus between the capital market and industrial performance in Nigeria can be studied within the framework of finance-led growth hypothesis and endogenous growth theory.

The finance-led growth hypothesis is based on an observation first made almost a century ago by Joseph Schumpeter that financial market significantly boosts real economic growth and development. The hypothesis postulates that the existence of financial sector as well as well- functioning financial intermediation mechanism provides avenues for channelling scarce and limited resources from the surplus spending units to the deficit units, thus boosting investment which in turn stimulates growth (Ovat, 2012). Following from Schumpeter (1912), Goldsmith (1969), McKinnon (1973) and Shaw (1973) laid the foundation for finance-led growth hypothesis. They argue that financial development promotes growth through savings and investments. In contrast, Robinson (1952) and Romer (1990) maintain that economic growth generates demand for financial services (demand-following). However, Wood (1993) and Akinboade (1998) report a bi-directional relationship between finance and growth.

The endogenous growth model is one in which the long-run growth rate of output per worker is determined by variables within the model, not an exogenous rate of technological progress as in a neoclassical growth model (Effiom, 2011). The vast literature on endogenous growth theory is built on the foundation earlier laid by Romer (1990), Grossman and Helpman (1991), Aghion and Howitt (1992) and Young (1998). The endogenous growth theory considers that whereas production function of a firm exhibits constant returns to scale (i.e, constant returns as to all factors) but there occur external increasing returns to scale. These external increasing returns to scale are due to the technological improvement which results from the rate of investment, size of the capital stock and the stock of human capital (Ahuja, 2000).

As a major criticism of the endogenous growth model, Parente (1999) in Effiom (2011) argues that the endogenous models do not help us understand why the whole world is not rich, especially in the face of huge differences in living standards. Another major weakness of the endogenous growth theories is the collective failure to explain conditional convergence reported in empirical literature (Sachs and Warner, 1997). Krugman (2013) criticised endogenous growth theory as nearly impossible to check by empirical evidence. However, the endogenous growth model commands more relevance in this study. The motivation for the endogenous growth model stems from the failure of the neoclassical theories to explain the sources of long-run economic growth. The capital market is an endogenous factor that stimulates industrial growth in an economy. The endogenous growth theory stresses the importance of financial intermediation for economic growth as many important services are provided by a country's financial system.

METHODOLOGY

This study adopts the Granger Causality test as an analytical methodology to investigate the nature of the relationship between the capital market and industrial performance. The Granger Causality test will determine the relationship between the variables of interest. According to Engle and Granger (1987), if two variables are co-integrated, then there is possibility of causality between the two at least in one direction. Before applying the Granger Causality test, it is important to conduct a stationarity test to ascertain that the variables in question are stationary either at level form or at first difference (Iyeli, 2010).

Given that time series data have a tendency for non-stationarity, there is need to conduct a stationarity test to prevent spurious or nonsensical results. The parameter estimates from such a regression may be biased and inconsistent (Engel and Granger, 1987). The standard approach for testing stationarity of time series data is the unit root test. One of the most commonly used techniques in testing the existence or otherwise of unit root is the Phillips-Perron (PP) unit root tests. Phillips and Perron use nonparametric statistical methods to take care of the serial correlation in the error terms without adding lagged difference terms (Gujarati, 2013). This study adopts this technique.

The study employs annual time series data, sourced from Central Bank of Nigeria (CBN) Statistical Bulletin (various years) and World Bank database (various years).

THE MODEL

The linkage between capital market and economic growth (in this case, industrial growth) has occupied a central position in the development Literature. In examining this on Nigeria's data, the study used the endogenous growth model to explain the sources of growth in an economy. The endogenous growth model specifies output as a linear function of labour (L) capital (K) and the index of technology (A), expressed as:

$$Y = f(K, L, A) \quad - - - - \quad (3.1$$

Where: Y= Output

K= Capital input

L= Labour input

A= Index of technology

The application of this method, however, has been extended and augmented to incorporate the capital market indices like market capitalization ratio, turnover ratio and total value traded ratio. It also includes such variables as share of expenditure on education in GDP and the share of domestic investment in GDP. The model in functional form is presented as follows:

$$INDGDP = F(MCAPR, TVSTR, TR, EDUGDP, INVGDP) \quad - - - - - - - \quad 3.2$$

Where: INDGDP = Share of industrial sector in GDP. This is an indicator of the performance of the industrial sector.

MCAPR = Market capitalisation ratio. This measure equals the value of listed shares divided by gross domestic product (GDP). The ratio is used as a measure of market size. The idea of the indicator is the larger the market size, the higher the ability to mobilise capital and diversify risk.

TVTR = Total Value of shares traded ratio. This is the total value of shares traded on the floor of the stock exchange divided by GDP. It reflects stock market liquidity in an economy wide basis.

TR = Turnover ratio. This is the amount of securities traded divided by the market capitalisation. It measures how active a market is. It also measures the trading volume of the market relative to size.

EDUGDP = Share of recurrent expenditure on education in GDP. It indicates the quality of the labour force.

INVGDP =.Share of domestic investment in GDP. It measures the extent to which mobilized capital is invested in the economy.

The model in its econometric linear form can be stated as;

$INDGDP = \beta_0+\beta_1 MCAPR+\beta_2 TVSTR+\beta_3 TR+\beta_4 EDUGDP+\beta_5 INVGDP+U$ - - - - - - - - - - 3.3

Where; U = Stochastic error term

For the purpose of causality test, the VAR specification of the system of equations is given as below;

$INGDP = \sum\alpha MCAPR_{t-1}+\sum\beta TVSTR_{t-1}+\sum\Omega TR_{t-1}+\sum\text{Ø} EDUGDP_{t-1}+\sum\mu INVGDP_{t-1}+\sum\prod INDGDP_{t-1}+U_1$ - - 3.4

$MCAPR=\sum\prod INDGDP_{t-1}+\sum\beta TVSTR_{t-1}+\sum\Omega TR_{t-1}+\sum\text{Ø} EDUGDP_{t-1}+\sum\mu INVGDP_{t-1}+\sum\alpha MCAPR_{t-1}+U_2$ - - 3.5

$TVSTR=\sum\prod INDGDP_{t-1}+\sum\alpha MCAPR_{t-1}+\sum\Omega TR_{t-1}+\sum\text{Ø} EDUGDP_{t-1}+\sum\mu INVGDP_{t-1}+\sum\beta TVSTR_{t-1}+U_3$ - - 3.6

$TR = \sum\prod INDGDP_{t-1}+\sum\alpha MCAPR_{t-1}+\sum\beta TVSTR_{t-1}+\sum\text{Ø} EDUGDP_{t-1}+\sum\mu INVGDP_{t-1}+\sum\Omega TR_{t-1}+U_4$ - - - - 3.7

$EDUGDP=\sum\prod INDGDP_{t-1}+\sum\alpha MCAPR_{t-1}+\sum\beta TVSTR_{t-1}+\sum\Omega TR_{t-1}+\sum\mu INVGDP_{t-1}+\sum\text{Ø} EDUGDP_{t-1}+ U_5$ - -3.8

$INVGDP= \sum\prod INDGDP_{t-1}+\sum\alpha MCAPR_{t-1}+\sum\beta TVSTR_{t-1}+\sum\Omega TR_{t-1}+\sum\text{Ø} EDUGDP_{t-1}+\sum\mu INVGDP_{t-1}+U_6$ - - 3.9

EMPIRICAL RESULTS AND ANALYSIS

DESCRIPTIVE STATISTICS

Table 1 below presents the descriptive statistics of the relevant variables in this study. This aim is to show the behaviour of the variables during the period under review.

TABLE 1: DESCRIPTIVE STATISTICS

	EDUGDP	INDGDP	INVGDP	MCAPR	TR	TVSTR
Mean	0.004190	0.249109	0.066521	0.108910	0.063086	0.008751
Median	0.004188	0.247635	0.058704	0.068561	0.059609	0.004082
Maximum	0.008403	0.333342	0.152687	0.399501	0.175588	0.042881

Minimum	0.000320	0.160112	0.036120	0.030535	0.010193	0.000406
Std. Dev.	0.001976	0.043528	0.029516	0.086974	0.037431	0.010338
Skewness	0.269630	-0.037363	2.071085	1.401398	0.677227	1.759157
Kurtosis	2.944371	2.252114	6.383159	5.003113	3.865145	5.776521
Jarque-Bera	0.379615	0.729685	36.94598	15.32966	3.336400	25.94648
Probability	0.827118	0.694306	0.000000	0.000469	0.188586	0.000002
Sum	0.129893	7.722372	2.062159	3.376196	1.955663	0.271268
Sum Sq. Dev.	0.000117	0.056840	0.026136	0.226936	0.042032	0.003206
Observations	31	31	31	31	31	31

Source: Authors` computation

From table 1 above, it is revealed that share of recurrent expenditure on education in GDP, share of industrial sector in GDP and share of domestic investment in GDP have mean values of 0.4%, 24.9% and 6.7%, respectively. Also, market capitalization ratio, turnover ratio and total value of traded ratio have mean values of 10.9%, 6.3% and 0.9%, respectively. The minimum values of share recurrent expenditure on education in GDP, share of industrial sector in GDP and share of domestic investment on GDP are 0.03%, 16.01% and 3.61%, respectively. Also, market capitalization ratio, turnover ratio and total value of shares traded ratio have minimum values of 3.05%, 1.02% and 0.041%, respectively. The variables (EDUGDP, INDGDP, INVGDP, MCAPR, TR AND TVSTR) have maximum values of 0.84%, 33.33%, 15.27%, 39.95%, 17.56% and 4.29%, respectively. It can also be seen that recurrent expenditure on education in GDP, share of industrial sector in GDP and share of domestic investment in GDP have standard deviation values of 0.20%, 4.35% and 3.0%, respectively. The standard deviation values for market capitalization ratio, turnover ratio and total value of traded ratio are 8.7%, 3.7% and 1.035, respectively. On the analysis of skewness, it is revealed that every other variable, except share of industrial sector in GDP, is positively skewed.

CORRELATION MATRIX

Table 2 below presents the correlation matrix which expresses the degree of association among the variables

TABLE 2: CORRELATION MATRIX

	EDUGDP	INDGDP	INVGDP	MCAPR	TR	TVSTR
EDUGDP	1.000000	-0.071806	-0.107366	0.066494	0.114687	0.061359
INDGDP	-0.071806	1.000000	-0.273590	-0.643503	-0.697579	-0.624899
INVGDP	-0.107366	-0.273590	1.000000	0.287333	0.051729	0.222238
MCAPR	0.066494	-0.643503	0.287333	1.000000	0.596704	0.890187

TR	0.114687	-0.697579	0.051729	0.596704	1.000000	0.820282
TVSTR	0.061359	-0.624899	0.222238	0.890187	0.820282	1.000000

Source: Authors' computation

From the result in table 4.2 above, it can be seen that share of industrial Sector in GDP has; a negative correlation with share of recurrent expenditure on education in GDP (-0.07); a negative correlation with share of domestic investment in GDP (-0.27); a negative correlation with market capitalization ratio (-0.64); a negative correlation with turnover ratio (-0.70); a negative correlation with total value of shares traded ratio (-0.62). Also, there is a high positive correlation between market capitalization ratio and total value of shares traded ratio (0.89). There is a high and positive correlation between turnover ratio and total value of shares traded ratio (0.82).

UNIT ROOT TEST

The unit root result is presented in table 3 below;

TABLE 3: PHILLIPS-PERRON UNIT ROOT TEST RESULT

Variable	At Level t-Statistic	5% Critical Value5% Critical Value	At First Differencing t-Statistic	5% Critical Value5% Critical Value	Order of Integration
TVSTR	-2.927932	-3.568379	-8.474129	-3.574244	*I* (1)
TR	-2.948779	-3.568379	-8.583282	-3.574244	*I* (1)
MCAPR	-3.219652	-3.568379	-7.902297	-3.574244	*I* (1)
INVGDP	-1.342387	-3.568379	-6.249562	-3.574244	*I* (1)
INDGDP	-2.439704	-3.568379	-8.408952	-3.574244	*I* (1)
EDUGDP	-3.625161	-3.568379	-	-	*I* (0)

Source: Authors' computation.

The results of the Phillips-Perron unit root test presented in table 3 reveals that apart from the share of recurrent expenditure on education in GDP, all the variables used in the study are stationary after first differencing. Thus, the they are I(1) series. The share of recurrent expenditure on education in GDP is stationary at level. It is thus an I(0) series.

CAUSALITY TEST

The Granger Causality test result is presented in table 4 below.

TABLE 4: GRANGER CAUSALITY TEST RESULT

Pairwise Granger Causality Tests
Date: 07/27/17 Time: 00:17
Sample: 1985 2015
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
INDGDP does not Granger Cause EDUGDP	29	0.13628	0.8733
EDUGDP does not Granger Cause INDGDP		0.81878	0.4529
INVGDP does not Granger Cause INDGDP	29	0.49915	0.6132
INDGDP does not Granger Cause INVGDP		0.28571	0.7540
MCAPR does not Granger Cause INDGDP	29	5.55760	0.0104
INDGDP does not Granger Cause MCAPR		1.32167	0.2854
TR does not Granger Cause INDGDP	29	4.73267	0.0185
INDGDP does not Granger Cause TR		2.31215	0.1207
TVSTR does not Granger Cause INDGDP	29	4.32126	0.0250
INDGDP does not Granger Cause TVSTR		1.74838	0.1955

Source: Authors' computation.

The Granger causality test result presented in table 4 shows that there is unidirectional causality running from total value of shares traded ratio to the share of the industrial sector in GDP. The result also show that there is also a unidirectional causality running from the market capitalization ratio to the share of the industrial sector in the GDP. Furthermore, there is a unidirectional causality running from the turnover ratio to the share of the industrial sector in the GDP. On the other hand, there is no causality between the share of domestic investment in GDP and the share of industrial sector in GDP. There is also no causality between the share of recurrent expenditure on education in GDP and the share of industrial sector in the GDP.

CONCLUSION AND RECOMMENDATIONS

This study set out to investigate empirically the causal relationship between the capital market and the performance of the industrial sector in Nigeria. The study examined the nexus between key capital market indices like market capitalization ratio (a proxy for market size), total value of shares traded ratio (a proxy for market liquidity) and turnover ratio (a proxy for market efficiency) in Nigeria from 1985 to 2015. The paper derived its theoretical basis from the finance-led growth hypothesis and the endogenous growth theory. In order to determine the time series characteristics of the variables used in the Granger causality test, the study adopted the Phillips-Perron unit root test. The result of the unit root test showed that the variables are either stationary at levels or at first difference, which clearly means that Granger causality test approach can be adopted in this paper.

Findings indicate that market capitalization ratio Granger causes industrial growth as shown by the unidirectional relationship running from market capitalization ratio to industrial growth. It means the size of the market can spur the performance of the industrial sector. Findings also showed that total value of shares traded ratio Granger causes industrial growth as indicated by the unidirectional relationship running from total value of shares traded ratio to industrial growth. It implies that a highly liquid market triggers the performance of the industrial sector. Also, findings revealed that turnover ratio Granger causes industrial growth as revealed by the unidirectional relationship running from turnover ratio to industrial growth. This means that a highly efficient market enhances industrial performance. The findings agree with the submissions of Bayar, Kaya and Mura (2014), Ogboi and Oladipo (2012) and Olweny and Kimani (2011). They reported a unidirectional relationship between capital market development and growth.

The policy implication of the findings of this paper is that Nigeria should evolve appropriate measures to develop the capital market and eliminate all the factors militating against the development of a virile capital market. The size, liquidity and efficiency of the capital market has been shown to spur the performance of the industrial sector by pooling the much needed long-term financial resources for industrial development.

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APPENDIX
PHILLIPS-PERRON UNIT ROOT TEST
Null Hypothesis: TVSTR has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.927932	0.1684
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	
*MacKinnon (1996) one-sided p-values.			
Residual variance (no correction)			4.42E-05
HAC corrected variance (Bartlett kernel)			4.14E-05
Phillips-Perron Test Equation			
Dependent Variable: D(TVSTR)			
Method: Least Squares			
Date: 07/26/17 Time: 23:43			
Sample (adjusted): 1986 2015			
Included observations: 30 after adjustments			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TVSTR(-1)	-0.526554	0.175940	-2.992807	0.0058
C	-0.001453	0.002738	-0.530427	0.6002
@TREND("1985")	0.000408	0.000210	1.941061	0.0628
R-squared	0.250546	Mean dependent var		0.000285
Adjusted R-squared	0.195031	S.D. dependent var		0.007811
S.E. of regression	0.007008	Akaike info criterion		-6.988938
Sum squared resid	0.001326	Schwarz criterion		-6.848818
Log likelihood	107.8341	Hannan-Quinn criter.		-6.944112
F-statistic	4.513123	Durbin-Watson stat		1.772683
Prob(F-statistic)	0.020373			

Null Hypothesis: D(TVSTR) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 20 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-8.474129	0.0000
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	
*MacKinnon (1996) one-sided p-values.			
Residual variance (no correction)			6.01E-05
HAC corrected variance (Bartlett kernel)			9.82E-06

Phillips-Perron Test Equation
Dependent Variable: D(TVSTR,2)
Method: Least Squares
Date: 07/26/17 Time: 23:43
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TVSTR(-1))	-1.113713	0.196154	-5.677754	0.0000
C	0.000957	0.003283	0.291518	0.7730
@TREND("1985")	-3.98E-05	0.000182	-0.219240	0.8282
R-squared	0.553808	Mean dependent var		-0.000193
Adjusted R-squared	0.519486	S.D. dependent var		0.011813
S.E. of regression	0.008188	Akaike info criterion		-6.674499
Sum squared resid	0.001743	Schwarz criterion		-6.533055
Log likelihood	99.78024	Hannan-Quinn criter.		-6.630201
F-statistic	16.13547	Durbin-Watson stat		2.042022
Prob(F-statistic)	0.000028			

Null Hypothesis: TR has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.948779	0.1625
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	
*MacKinnon (1996) one-sided p-values.			
Residual variance (no correction)			0.000761
HAC corrected variance (Bartlett kernel)			0.000705

Phillips-Perron Test Equation
Dependent Variable: D(TR)
Method: Least Squares

Date: 07/26/17 Time: 23:43
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TR(-1)	-0.531135	0.175736	-3.022338	0.0054
C	0.015243	0.011666	1.306547	0.2024
@TREND("1985")	0.001204	0.000760	1.585408	0.1245

R-squared	0.254017	Mean dependent var	0.000285
Adjusted R-squared	0.198759	S.D. dependent var	0.032491
S.E. of regression	0.029083	Akaike info criterion	-4.142658
Sum squared resid	0.022838	Schwarz criterion	-4.002539
Log likelihood	65.13988	Hannan-Quinn criter.	-4.097833
F-statistic	4.596938	Durbin-Watson stat	2.051298
Prob(F-statistic)	0.019135		

Null Hypothesis: D(TR) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 13 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-8.583282	0.0000
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000900
HAC corrected variance (Bartlett kernel)	0.000479

Phillips-Perron Test Equation
Dependent Variable: D(TR,2)
Method: Least Squares
Date: 07/26/17 Time: 23:44
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TR(-1))	-1.358674	0.182699	-7.436677	0.0000
C	-0.000514	0.012698	-0.040483	0.9680
@TREND("1985")	2.02E-05	0.000703	0.028757	0.9773

R-squared	0.680215	Mean dependent var	-0.001649
Adjusted R-squared	0.655616	S.D. dependent var	0.053990

S.E. of regression	0.031683	Akaike info criterion	-3.968345
Sum squared resid	0.026100	Schwarz criterion	-3.826900
Log likelihood	60.54100	Hannan-Quinn criter.	-3.924046
F-statistic	27.65233	Durbin-Watson stat	2.038362
Prob(F-statistic)	0.000000		

Null Hypothesis: MCAPR has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.219652	0.0998
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.002187
HAC corrected variance (Bartlett kernel)	0.002116

Phillips-Perron Test Equation
Dependent Variable: D(MCAPR)
Method: Least Squares
Date: 07/26/17 Time: 23:44
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCAPR(-1)	-0.563337	0.173492	-3.247053	0.0031
C	-0.003945	0.018672	-0.211269	0.8343
@TREND("1985")	0.004440	0.001723	2.577459	0.0157

R-squared	0.280838	Mean dependent var	0.004876
Adjusted R-squared	0.227567	S.D. dependent var	0.056086
S.E. of regression	0.049293	Akaike info criterion	-3.087426
Sum squared resid	0.065605	Schwarz criterion	-2.947306
Log likelihood	49.31139	Hannan-Quinn criter.	-3.042601
F-statistic	5.271859	Durbin-Watson stat	1.828951
Prob(F-statistic)	0.011672		

Null Hypothesis: D(MCAPR) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 12 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*

Phillips-Perron test statistic			-7.902297	0.0000
Test critical values:	1% level		-4.309824	
	5% level		-3.574244	
	10% level		-3.221728	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.003080
HAC corrected variance (Bartlett kernel)	0.000730

Phillips-Perron Test Equation
Dependent Variable: D(MCAPR,2)
Method: Least Squares
Date: 07/26/17 Time: 23:44
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MCAPR(-1))	-1.142748	0.194291	-5.881623	0.0000
C	0.006667	0.023503	0.283669	0.7789
@TREND("1985")	-5.21E-05	0.001301	-0.040039	0.9684

R-squared	0.570997	Mean dependent var	-0.000282
Adjusted R-squared	0.537997	S.D. dependent var	0.086236
S.E. of regression	0.058615	Akaike info criterion	-2.737955
Sum squared resid	0.089329	Schwarz criterion	-2.596510
Log likelihood	42.70034	Hannan-Quinn criter.	-2.693656
F-statistic	17.30281	Durbin-Watson stat	2.093455
Prob(F-statistic)	0.000017		

Null Hypothesis: INVGDP has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

			Adj. t-Stat	Prob.*
Phillips-Perron test statistic			-1.342387	0.8571
Test critical values:	1% level		-4.296729	
	5% level		-3.568379	
	10% level		-3.218382	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000365
HAC corrected variance (Bartlett kernel)	0.000365

Phillips-Perron Test Equation
Dependent Variable: D(INVGDP)
Method: Least Squares
Date: 07/26/17 Time: 23:45
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INVGDP(-1)	-0.206250	0.153644	-1.342387	0.1906
C	0.007081	0.010760	0.658072	0.5161
@TREND("1985")	0.000615	0.000446	1.379052	0.1792

R-squared	0.095052	Mean dependent var	0.003471
Adjusted R-squared	0.028019	S.D. dependent var	0.020424
S.E. of regression	0.020136	Akaike info criterion	-4.877999
Sum squared resid	0.010947	Schwarz criterion	-4.737879
Log likelihood	76.16999	Hannan-Quinn criter.	-4.833174
F-statistic	1.417987	Durbin-Watson stat	1.939683
Prob(F-statistic)	0.259668		

Null Hypothesis: D(INVGDP) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.249562	0.0001
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000389
HAC corrected variance (Bartlett kernel)	0.000218

Phillips-Perron Test Equation
Dependent Variable: D(INVGDP,2)
Method: Least Squares
Date: 07/26/17 Time: 23:45
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INVGDP(-1))	-1.135857	0.194154	-5.850274	0.0000
C	-0.005861	0.008393	-0.698374	0.4911

@TREND("1985")	0.000600	0.000473	1.267775	0.2161
R-squared	0.568291	Mean dependent var		-0.000451
Adjusted R-squared	0.535083	S.D. dependent var		0.030533
S.E. of regression	0.020819	Akaike info criterion		-4.808199
Sum squared resid	0.011269	Schwarz criterion		-4.666754
Log likelihood	72.71888	Hannan-Quinn criter.		-4.763900
F-statistic	17.11290	Durbin-Watson stat		2.097951
Prob(F-statistic)	0.000018			

Null Hypothesis: INDGDP has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 10 (Newey-West automatic) using Bartlett kernel

			Adj. t-Stat	Prob.*
Phillips-Perron test statistic			-2.439704	0.3533
Test critical values:	1% level		-4.296729	
	5% level		-3.568379	
	10% level		-3.218382	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000632
HAC corrected variance (Bartlett kernel)	0.000247

Phillips-Perron Test Equation
Dependent Variable: D(INDGDP)
Method: Least Squares
Date: 07/26/17 Time: 23:45
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INDGDP(-1)	-0.494830	0.166640	-2.969465	0.0062
C	0.153644	0.051302	2.994877	0.0058
@TREND("1985")	-0.002093	0.000775	-2.699209	0.0118
R-squared	0.262486	Mean dependent var		-0.003529
Adjusted R-squared	0.207856	S.D. dependent var		0.029777
S.E. of regression	0.026502	Akaike info criterion		-4.328552
Sum squared resid	0.018964	Schwarz criterion		-4.188432
Log likelihood	67.92827	Hannan-Quinn criter.		-4.283726
F-statistic	4.804749	Durbin-Watson stat		1.672185
Prob(F-statistic)	0.016402			

Null Hypothesis: D(INDGDP) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 28 (Newey-West automatic) using Bartlett kernel

			Adj. t-Stat	Prob.*
Phillips-Perron test statistic			-8.408952	0.0000
Test critical values:	1% level		-4.309824	
	5% level		-3.574244	
	10% level		-3.221728	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000855
HAC corrected variance (Bartlett kernel)	7.86E-05

Phillips-Perron Test Equation
Dependent Variable: D(INDGDP,2)
Method: Least Squares
Date: 07/26/17 Time: 23:46
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INDGDP(-1))	-1.013750	0.200700	-5.051071	0.0000
C	0.006851	0.012383	0.553247	0.5848
@TREND("1985")	-0.000629	0.000687	-0.914885	0.3687

R-squared	0.498470	Mean dependent var	-0.001135
Adjusted R-squared	0.459891	S.D. dependent var	0.042031
S.E. of regression	0.030890	Akaike info criterion	-4.019097
Sum squared resid	0.024808	Schwarz criterion	-3.877653
Log likelihood	61.27691	Hannan-Quinn criter.	-3.974798
F-statistic	12.92068	Durbin-Watson stat	1.958107
Prob(F-statistic)	0.000127		

Null Hypothesis: EDUGDP has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 13 (Newey-West automatic) using Bartlett kernel

			Adj. t-Stat	Prob.*
Phillips-Perron test statistic			-3.625161	0.0444
Test critical values:	1% level		-4.296729	
	5% level		-3.568379	
	10% level		-3.218382	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	3.20E-06
HAC corrected variance (Bartlett kernel)	1.40E-06

Phillips-Perron Test Equation
Dependent Variable: D(EDUGDP)
Method: Least Squares
Date: 07/26/17 Time: 23:46
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDUGDP(-1)	-0.696355	0.181026	-3.846717	0.0007
C	0.002738	0.000923	2.967817	0.0062
@TREND("1985")	1.72E-05	4.12E-05	0.417416	0.6797

R-squared	0.359930	Mean dependent var	7.03E-05
Adjusted R-squared	0.312518	S.D. dependent var	0.002274
S.E. of regression	0.001885	Akaike info criterion	-9.614801
Sum squared resid	9.60E-05	Schwarz criterion	-9.474681
Log likelihood	147.2220	Hannan-Quinn criter.	-9.569975
F-statistic	7.591456	Durbin-Watson stat	1.903611
Prob(F-statistic)	0.002421		

GRANGER CAUSALITY TEST

Pairwise Granger Causality Tests
Date: 07/27/17 Time: 00:17
Sample: 1985 2015
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
INDGDP does not Granger Cause EDUGDP	29	0.13628	0.8733
EDUGDP does not Granger Cause INDGDP		0.81878	0.4529
INVGDP does not Granger Cause EDUGDP	29	0.47661	0.6266
EDUGDP does not Granger Cause INVGDP		0.10231	0.9031
MCAPR does not Granger Cause EDUGDP	29	0.15521	0.8571
EDUGDP does not Granger Cause MCAPR		0.06481	0.9374
TR does not Granger Cause EDUGDP	29	0.09027	0.9140
EDUGDP does not Granger Cause TR		0.29139	0.7498
TVSTR does not Granger Cause EDUGDP	29	0.19473	0.8243
EDUGDP does not Granger Cause TVSTR		0.14071	0.8695
INVGDP does not Granger Cause INDGDP	29	0.49915	0.6132

INDGDP does not Granger Cause INVGDP		0.28571	0.7540
MCAPR does not Granger Cause INDGDP	29	5.55760	0.0104
INDGDP does not Granger Cause MCAPR		1.32167	0.2854
TR does not Granger Cause INDGDP	29	4.73267	0.0185
INDGDP does not Granger Cause TR		2.31215	0.1207
TVSTR does not Granger Cause INDGDP	29	4.32126	0.0250
INDGDP does not Granger Cause TVSTR		1.74838	0.1955
MCAPR does not Granger Cause INVGDP	29	0.96066	0.3969
INVGDP does not Granger Cause MCAPR		0.39175	0.6801
TR does not Granger Cause INVGDP	29	0.19560	0.8236
INVGDP does not Granger Cause TR		1.64201	0.2146
TVSTR does not Granger Cause INVGDP	29	0.41455	0.6653
INVGDP does not Granger Cause TVSTR		1.20743	0.3165
TR does not Granger Cause MCAPR	29	1.36749	0.2739
MCAPR does not Granger Cause TR		14.2066	8.E-05
TVSTR does not Granger Cause MCAPR	29	0.89721	0.4209
MCAPR does not Granger Cause TVSTR		20.9358	5.E-06
TVSTR does not Granger Cause TR	29	5.94439	0.0080
TR does not Granger Cause TVSTR		7.74796	0.0025

DATA

YEAR	INDGDP	EDUGDP	INVGDP	MCAPR	TVSTR	TR
1985	0.265978	0.001345	0.045768	0.034326	0.001647	0.04797
1986	0.252331	0.001298	0.056067	0.033591	0.00246	0.073221
1987	0.262608	0.000902	0.061057	0.032874	0.001533	0.046634
1988	0.268721	0.004554	0.054819	0.031218	0.002654	0.08503
1989	0.292773	0.007185	0.064003	0.030535	0.001456	0.04768
1990	0.29612	0.004809	0.080292	0.032621	0.000451	0.013828
1991	0.314374	0.002108	0.075816	0.038755	0.000406	0.010481
1992	0.333342	0.00032	0.07783	0.034293	0.00054	0.01576
1993	0.29063	0.007055	0.076977	0.037726	0.000639	0.016935
1994	0.276586	0.004188	0.059893	0.03761	0.000559	0.01487
1995	0.297817	0.003366	0.049019	0.06231	0.000635	0.010193
1996	0.305237	0.003042	0.053994	0.075626	0.001847	0.024421
1997	0.284885	0.003613	0.059076	0.068561	0.002513	0.036646
1998	0.229551	0.002961	0.052792	0.057224	0.002957	0.05168
1999	0.247635	0.008217	0.043649	0.056525	0.002651	0.046907
2000	0.304532	0.008403	0.047997	0.068474	0.004082	0.059609
2001	0.241561	0.004903	0.04575	0.081447	0.007092	0.08707
2002	0.19224	0.007106	0.044094	0.067498	0.005242	0.077666
2003	0.218231	0.00487	0.065096	0.102191	0.009052	0.088577
2004	0.230484	0.004418	0.049827	0.12196	0.013037	0.106897
2005	0.228117	0.003718	0.03612	0.130223	0.011807	0.090666

2006	0.21484	0.004152	0.053957	0.178662	0.016407	0.09183
2007	0.206094	0.00457	0.058704	0.399501	0.032611	0.08163
2008	0.206153	0.004188	0.052429	0.244216	0.042881	0.175588
2009	0.169669	0.003096	0.068884	0.158761	0.015484	0.09753
2010	0.220339	0.003128	0.07348	0.181611	0.014647	0.080651
2011	0.248116	0.005332	0.062055	0.163151	0.010145	0.06218
2012	0.236709	0.004858	0.046817	0.206389	0.011281	0.054658
2013	0.219924	0.004875	0.14331	0.238192	0.029352	0.123228
2014	0.206665	0.003861	0.152687	0.189515	0.01499	0.079098
2015	0.160112	0.003454	0.149898	0.180609	0.01021	0.056531

SOURCES: CBN STATISTICAL BULLETIN (VARIOUS YEARS), WORLD BANK WDI (2015)