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CAPITAL MARKET AND INDUSTRIAL SECTOR DEVELOPMENT IN NIGERIA- AN EMPIRICAL INVESTIGATION

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ABSTRACT: *This study examined the relationship between capital market and industrial sector development in Nigeria, utilizing annual time series data covering the period from 1980 to 2012. The study adopted both descriptive and analytical methodology in its investigation. The descriptive methods were used to analyze trend performances of the variables captured in the study. The analytical methodology employed modern econometric techniques such as the unit root test, co-integration test, granger causality test and the error correction mechanism (ECM) in the estimation of the relevant relationships. The results of the co-integration test showed that there existed a long run equilibrium relationship among the variables. The results of the granger causality test as presented showed that there is a bi-directional relationship between industrial output and market capitalization and between industrial output and number of deals, but a unidirectional causality relationship running from industrial sector development to value of transaction. The results of the short run dynamics revealed that capital market has positive and significant impact on industrial output in Nigeria via market capitalization and number of deals. On the other hand, value of transaction has negative and significant impact on industrial output in Nigeria during the evaluation period. The results also showed that real gross domestic product has a positive and significant impact on industrial output in Nigeria, while exchange rate and gross domestic investment have negative and significant relationship with industrial output in Nigeria. The study therefore recommended that the government should implement appropriate reform policies aimed at ensuring efficiency in the workings of the stock market in Nigeria. Also, there is need to reduce the cost of raising capital by firms on the stock as high cost and other bureaucratic delays could limited the use of capital market as veritable source of raising funds for investment.*

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KEYWORDS: Capital Market, Industrial Development, Nigeria

INTRODUCTION

It is usually argued by development economists that industrial sector development is pre-requisite capable of transforming an underdeveloped economy into a developed one. This is

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because industrialization is believed to be a catalyst capable of propelling a structural transformation and diversification of an economy. Over the years, successive governments in Nigeria have instituted various policies and programmes aimed at industrializing the Nigerian economy. However, despite these drives for industrialization, the efforts have seemed not to be yielding fruitful results as the share of industrial sector in total output remained unimpressive (Udoh and Udeaja, 2011). For instance, manufacturing sub-sector which is at the heart of industrial sector has continued to perform poorly over the years. Evidence has shown that manufacturing share of the GDP has increased from 7.17 per cent in 1970 to 10.4% in 1980 before declining steadily to 5.50 per cent in 1990. By 2000, the manufacturing share of total GDP has declined to 3.67 per cent before declining consistently to 1.89 per cent in 2010. As at 2012, the manufacturing share of GDP had fallen drastically to 1.88 per cent (CBN, 2012).

The poor performance of industrial sector as evidenced in the dismal performance of the manufacturing sub-sector has been attributed to so many factors, including capacity under-utilization; poor and decaying infrastructures; low level of technology; low investment; high cost of production; high rates of inflation; hostile investment climate; policy non-implementation and reversals; lack of political will to really industrialized the Nigerian economy; corruption, weak institutions; poor domestic linkages; general macroeconomic instability and lack of finance capital to build up production capacity in the various industries, etc. The effort in providing solution to the problem of finance makes the role of capital market more imperative in this regard.

Capital market has been known to perform two important functions of mobilizing funds from surplus sources and making same available to deficit sources, thereby matching individual saver's needs with firms requiring funds, and the resulting capital accumulation leads to increased investment and economic growth (Chou and Yuan, 2007). And since the expansion of firms and building of new ones requires huge capital in the form importation of technology, expertise and machineries, it is capital market that can provide the needed capital in the form of issuance of equity capital for such huge and long gestation investment. However, given the undeveloped and shallow nature of capital markets in developing countries, it is debatable whether capital markets in developing countries in general and capital market in Nigeria in particular has led to industrial sector development. More than that, this study contributes to the ongoing debate on whether capital market in Nigeria has aided industrial development. To the best of our knowledge, this study is the first to use an expanded period of time and modern econometric techniques in examining empirically the impact of capital market on industrial sector development in Nigeria. This study is organized into six sections. Section one is the introduction. Section two reviews literature on past and related studies. Section three presents theoretical framework and empirical model. Methodology and data is the focus of section four. Section five analyzes the empirical results, and section six is the conclusion.

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LITERATURE REVIEW

Large amount of study exists examining the role of capital market in economic growth of an economy. This study however reviews the recent studies in this regard. Oke and Adeusi (2012) examined the effect of capital market on economic growth in Nigeria, using time series data from 1981 to 2012. The study adopted the ordinary least squares (OLS) regression technique within the framework of co-integration and error correction mechanism. The results of the co-integration analysis showed that there is a long run relationahip among the variables. The results of the short run error correction model revealed that capital market promoted economic development in Nigeria during the period. Ifionu and Omojefe (2013) investigated the impact of capital market on economic growth in Nigeria, using annual time series data spanning the period from 1985 to 2010. The analysis was carried out under the framework of error correction mechanism. The result of the co-integration test indicated that there is long run relationship among the variables. The results of the short run dynamics revealed that capital market has positive impact on economic growth in Nigeria via market capitalization both in the short run and in the long run. Employing the ordinary least squares (OLS) regression technique, Nwaolisa, Kasie and Egbunike (2013) examined the impact of capital market on economic growth in Nigeria during the democratic dispensation covering the period from 1999 to 2011. The result of the study found that capital market has positive but insignificant impact on economic growth in Nigeria during the evaluation period.

While there are numerous studies on the relationship between capital market and economic growth, studies on the impact of capital market on industrial sector performance are relatively scarce and ongoing. Udegbunam (2002) examined the effect of openness, stock market development and industrial growth in Nigeria, utilizing annual time series data covering the period from 1970 to 1997. This study employed the granger causality test and ordinary least squares (OLS) regression techniques in testing the causality relationship and in estimating the specified relationship, respectively. The result of the granger causality test showed that there is no causal relationship between stock market development, openness and economic growth in Nigeria during the evaluation period. The empirical results of the OLS estimate however showed that stock market development has positive and significant relationship with economic growth in Nigeria. In his empirical study, Oke (2012) examined the effect of capital market activities on the development of the Nigerian oil industries, utilizing annual time series data covering the period from 1999 to 2009 under the framework of cointegration technique and error correction mechanism. The result of the cointegration test showed that there is equilibrium long run relationship among the variables in the model. The results of the empirical estimation showed that stock market capitalization and stock market prices have positive effect on the development of oil and gas industry in Nigeria in the short run but negative impact on the sector in the long run. Victor, Kenechukwu and Richard (2013) undertook analysis into the effect of capital market on Nigeria's industrial sector development, using data from 1980 to 2008 using descriptive

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statistic methods. The result of the analysis showed that capital market has positive relationship with industrial sector development in Nigeria.

From the review of literature above, it can be observed that not much study have been conducted on the impact of capital market on industrial sector development in Nigeria. Few studies earlier conducted in Nigeria have not utilized extended time period and modern estimation methods as employed in this study. For instance, Udegbunam (2002) in his study has examined the effect of openness, stock market development and industrial growth in Nigeria, utilizing annual time series data covering the period from 1970 to 1997 and employing Ordinary Least squares (OLS) as estimation technique. In another study, Oke (2012) has examined the effect of capital market activities on the development of the Nigerian oil industries, utilizing annual time series data covering the period from 1999 to 2009 under the framework of cointegration technique and error correction mechanism. Meanwhile, Victor, Kenechukwu and Richard (2013) have undertook analysis into the effect of capital market on Nigeria's industrial sector development, using data from 1980 to 2008 employing descriptive statistic methods. This study contributes to the current debate but differs from the previous studies by using a fairly large period of time from 1980 to 2012 in analyzing the impact of capital market on industrial sector development in Nigeria. In addition to an extended period of time used, this study also adopted recent modern estimation techniques such as Co-integration test, Granger Causality test and Error Correction Mechanism (ECM) in its analysis. These are gaps this study intends to fill.

THEORETICAL FRAMEWORK AND EMPIRICAL MODEL

Although theories linking capital market development to industrial sector development are scarce, however, the relationship between capital market development and industrial sector performance can be established employing neo-classical growth and endogenous growth theory. The Solow (1956) and Swan (1956) type neo-classical theory states that long run aggregate output can be enhanced by technological improvement. The neo-classical theorists held that improvement in technological advancement is capable of pushing the production function upward, there by leading to the overall growth in an economy. The main stream neo-classical growth theory held that increase in savings rate will bring about a temporary increase in aggregate output in the short run but in the long run, output will adjust to a new level and savings accumulation will only affect aggregate output and not its growth rate (Ndako, 2010). The implication of this is that notwithstanding the savings rate, financial development will have no significant effect on the long run aggregate output.

However, the emergence of endogenous growth model following the criticisms laid against the neo-classical growth model has increasingly acknowledged the role of financial development in the process of economic growth. According to the endogenous growth model, growth rate of aggregate output can be determined within the model rather outside the model through savings and investment. Within the endogenous growth model, theoretical literature such as Bencivenga

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and Smith (1991), Levine and S. Zervos (1996) and Caporale, Howells and Soliman [2004] have held that financial market has a long run impact on economic growth by mobilizing savings into productive investment which leads to the growth rate of output. Therefore, an efficient and functional financial market can lead to an increase in aggregate output (Olweny and Kimani, 2011).

Meanwhile, within the neo-classical model, the impact of capital market on economic growth can be captured by using unrestricted neo-classical growth model of the Cobb-Douglas (C-D) type. This type of growth model will enable us to introduce modifications and extension to bring it more in line with empirical phenomena of related variables accounting for increasing returns (Sinai and Stockes, 1972; Ndebbio, 1991). Thus, increased investment in the capital market provides investible funds needed for investment in the country, which in turn leads to economic growth.

In examining the relationship between capital market development and industrial sector development in Nigeria, the study applied the neoclassical growth model, otherwise referred to as the growth accounting framework to explain the source of growth in an economy. The Neo-Classical growth model specifies output as a linear function of Labour (L), Capital (K) and the index of technology (A), expressed as:

$$Y = F(K, L, T) \quad \text{..... (1)}$$

Where: Y is output, K is physical capital, L is labour force and A is an index of technology or efficiency parameter.
The application of this model has enabled us to extend and augment it incorporate the capital market variables such as market capitalization, number of deals and value of transactions. However, since the specific objective of this study is to examine the relationship between capital market development and industrial growth, the empirical model in (1) is modified slightly with industrial output replacing total output and gross domestic investment replaces physical capital. Real output is also captured to reflect the effect of growth in overall output on individual component such as the industrial sector. The study also include exchange rate to capture the extent of international competiveness. Therefore, the basic model in its functional form is specified as follows:

$$INDOUT = f(RGDP, MCAP, NDEALS, VTRAN, EXCH, GDI) \quad \text{..... (2)}$$

Where:
INDOUT = industrial output
RGDP = real gross domestic product
MCAP = market capitalization
NDEALS = number of deals
VTRAN = value of transaction

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EXCH = exchange rate
GDI = gross domestic investment
The model in its econometric linear form can be expressed as
$INDOUT = \alpha_0 + \alpha_1 RGDP + \alpha_2 MCAP + \alpha_3 NDEALS + \alpha_4 VTRAN + \alpha_5 EXCH + \alpha_6 GDI + U$ ..... (3)
Where: α_o to α_5 are the parameters to be estimated and U is the stochastic error term.
The theoretical expectations about the signs of the coefficients of the parameters are as follow:
$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_6 > 0; \alpha_5 < 0$

METHODOLOGY AND DATA

This study employed the Error Correction Mechanism in the estimation of the relevant equations. However, before estimating the error correction model, the study has tested for Unit Root, Co-integration among variables in the model and Granger Causality to determine the direction of causality between the variables of interest. The unit root test is conducted using the Augmented Dickey Fuller (ADF) test proposed by Dickey and Fuller (1979) and Phillips-Perron (PP) test proposed by Phillips and Perron (1988) with intercept only. Given the time series nature of the data used, the unit root procedure requires estimating the following ADF and PP equations as follows:

ADF Estimation:

$$\Delta Y_t = a_0 + \gamma Y_{t-1} + \sum_{i=1}^{k} \beta_i \Delta Y_{t-i} + U_t \quad \text{.....(4)}$$

Where:

$\Delta Y_t = Y_t - Y_{t-1}$ is the difference of series Y_t;

$\Delta Y_{t-1} = Y_{t-1} - Y_{t-2}$ is the first difference of Y_{t-1}

PP Equation:

$$Y_t = \lambda_0 + \rho Y_{t-1} + \varepsilon_t \quad \text{.....(5)}$$

Where:
α_0, λ_0, γ, β_i, and ρ are parameters to be estimated; U_t, and ε_t are stochastic error terms. In both ADF and PP tests, the null hypothesis of non stationarity (Presence of unit root) is accepted if $\gamma = 0$ and $\rho = 1$ respectively, while the null hypothesis of non stationarity is rejected if $\gamma < 0$ and $\rho < 1$ respectively.

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Co-integration Test

Suppose the series is integrated of order 1(1), this suggests the existence of a long run relationship among the variables and the co-integration test is carried out to test the long-run association among the variables and to provide the long-run estimates of the variables. To achieve this, the cointegration test is conducted to establish the cointegrating rank of the forcing variables. The cointegration test is based on the Johnansen and Jesulius (1990) multivariate cointegration test, using the trace and maximum eigenvalue tests. The cointegration test involves estimating and then testing the null hypothesis (H_0) of no long run relationship against the alternative hypothesis (H_a) that there is a long-run relationship. That is: H_0: $\alpha_1=\alpha_2=\alpha_3=\alpha_4=\alpha_5=\alpha_5=\alpha_6=\alpha_7=0$, against the alternative hypothesis: H_a: $\alpha_1\neq\alpha_2\neq\alpha_3\neq\alpha_4\neq\alpha_5\neq\alpha_5\neq\alpha_5\neq\alpha_5\neq0$. The trace values and the maximum eigen values are then compared with the critical value at 5% level. If at most one trace value and the maximum eigen value exceeds the critical value at 5% level, then the null hypothesis of no cointegration is rejected, hence there is cointegration and vice versa.

Granger Causality Test

Next, we proceed to test whether there is any causal relationship between industrial sector output and the various capital market variables captured in the model. 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. The Granger causality test for the series can be specified in its general form as:

$$Y_t = \sum_{i=1}^{j} \delta_{11i} Y_{t-i} + \sum_{i=1}^{j} \delta_{12i} X_{t-i} + U_{1t} \quad \text{.....(6)}$$

$$X_t = \sum_{i=1}^{j} \delta_{21i} X_{t-i} + \sum_{i=1}^{j} \delta_{22i} Y_{t-i} + U_{2t} \quad \text{.....(7)}$$

Where:

Y = the industrial output, X = indicators of capital market development, t = the current period of the variables and t-i = the lagged period of the variables, δ_{11} to δ_{22} = the coefficients of the lagged variables and U_1, U_2 = the mutually uncorrelated white noise error terms.

Error Correction Model

An error correction model (ECM) is used to detect the dynamics of short-term and long term of a variable around its stationary equilibrium value. Thus, for an adjustment error correction requires that the sign of the coefficient of the residual is negative and statistically significant. In this regard, the higher the absolute value of the coefficient is, the faster we reach the long-run equilibrium. The short – run relationships based on (2) can be expressed as Error correction Mechanism (ECM) as follows.

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$$\Delta INDOUT_t = \lambda_0 + \sum_{i=1}^{j} \lambda_{1i} \Delta RGDP_t + \sum_{i=1}^{j} \lambda_{2i} \Delta MCAP_t + \sum_{i=1}^{j} \lambda_{3i} \Delta NDEALS_t + \sum_{i=1}^{j} \lambda_{4i} \Delta VTRAN_t$$

$$+ \sum_{i=1}^{j} \lambda_{5i} \Delta EXCH_t + \sum_{i=1}^{j} \lambda_{6i} \Delta GDI_t + \phi ECM_{t-i} + U_t \quad \text{.....(8)}$$

Where: ECM is the error correction variable and U is the white noise error term.

This study employs time series data collected on annual basis from 1980-2012. The relevant data for this study were obtained from the Central Bank of Nigeria Statistical Bulletin, the Central Bank of Nigeria (CBN) Annual Reports and Statement of Accounts and the National Bureau of Statistics.

ANALYSIS OF EMPIRICAL RESULTS

Data Presentation: Descriptive Statistics

Table 1 below presents the descriptive statistics on the selected macroeconomic variables captured in this study. The aim of the analysis is to examine the performance of the variables during the evaluation period.

Table 1: Descriptive Statistics

	INDOUT	RGDP	MCAP	NDEALS	VTRAN	EXCH	GDI
Mean	115265.4	379876.3	2401.166	548484.2	211125.1	60.46212	762714.7
Median	114992.2	293745.4	262.6000	49564.00	6979.600	21.89000	204047.6
Maximum	162985.3	888893.0	14800.90	3535631.	1679144.	157.5000	4007832.
Minimum	10922.91	31546.76	5.000000	7138.000	215.0000	0.550000	8799.480
Std. Dev.	34002.03	216245.0	4260.711	861247.8	396985.9	61.41331	1196268.
Skewness	-0.640078	0.903011	1.733441	1.905443	2.148578	0.384282	1.705239
Kurtosis	3.796829	2.763354	4.642652	6.192894	7.241125	1.339198	4.577110
Jarque-Bera	3.126389	4.561860	20.23666	33.98646	50.12244	4.604814	19.41313
Probability	0.209466	0.102189	0.000040	0.000000	0.000000	0.100018	0.000061
Sum	3803759.	1253591 9	79238.49	1809997 8	6967130.	1995.250	25169586
Sum Sq. Dev.	3.70E+1 0	1.50E+1 2	5.81E+0 8	2.37E+1 3	5.04E+12	120691.0	4.58E+13
Observations	33	33	33	33	33	33	33

Source: Authors' Computation

Data as presented in table 1 above showed that industrial output, real gross domestic product, market capitalization, number of deals, value of transaction, exchange rate and gross domestic investment averaged N115265.4 million, N379876.3 million, N2401.17 million, 548,484.2 million deals, N211125.1 million, N60.46:US$1 and N762714.7 million, respectively during the

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evaluation period. The minimum values of industrial output, real gross domestic product, market capitalization, number of deals, value of transaction, exchange rate and gross domestic investment were N10922.91 million, N31546.76 million, N5.0 million, 7138.0 million deals, N215.0 million, N0.55:US1 and N8799.48 million, respectively, while their respective maximum values were N162985.3 million, N888893.0 million, N14800.90 million, 3535631.o million deals, N1679144.0 million, N157.5: US$1 and N4007832.0 million during the same period. The analysis of skewness showed that the distributions for real gross domestic product, market capitalization, number of deals, value of transaction, exchange rate and gross domestic investment were positively skewed, while the distribution for industrial output were negatively skewed.

5.2 Correlation Matrix

Table 2 below presents correlation matrix, which shows correlation relationships among the variables in the model.

Table 2: Correlation Matrix

	INDOUT	RGDP	MCAP	NDEALS	VTRAN	EXCH	GDI
INDOUT	1.000000	0.888001	0.663913	0.665385	0.607466	0.849877	0.698266
RGDP	0.888001	1.000000	0.894281	0.805306	0.803277	0.903511	0.932056
MCAP	0.663913	0.894281	1.000000	0.844046	0.895390	0.733426	0.904108
NDEALS	0.665385	0.805306	0.844046	1.000000	0.973382	0.735131	0.757444
VTRAN	0.607466	0.803277	0.895390	0.973382	1.000000	0.667634	0.788006
EXCH	0.849877	0.903511	0.733426	0.735131	0.667634	1.000000	0.791709
GDI	0.698266	0.932056	0.904108	0.757444	0.788006	0.791709	1.000000

Source: Authors' Computation

The results as presented in table 2 above showed that there is a high positive correlation between industrial output and real gross domestic product (0.89); between industrial output and market capitalization (0.66); between industrial output and number of deals (0.67); between industrial output and value of transaction (0.61); between industrial output and exchange rate (0.85); and between industrial output and gross domestic investment (0.70). The results of the correlation as presented above suggest that there is a high relationship between industrial output and its determinants.

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Trend Analysis

Table 3 below presents trend analysis of selected macroeconomic variables captured in this study. As shown in the table, market capitalization rose from N5.0 billion in 1980 to N5.7 billion in 1983 but fell briefly to N5.5 billion in 1984 and after rose consistently to N285.8 billion in 1996. Market capitalization however fell from N285.8 billion in 1996 to NN262.6 billion in 1998 but thereafter rose increasingly from N300.0 billion in 1999 to N13,294.6 billion in 2007 but fell sharply to N7,030.84 billion in 2009 following the global financial crises. The recovery from the crisis led to an increase in market capitalization from N9,672.65 billion in 2011 to N14,800.90 billion in 2012.

Data as shown in table 3 indicated that number of deals rose from 7,138 in 1980 to 27,718 in 1986. Number of deals fluctuated between 20,525 and 49,564 from 1987 to 1996 but thereafter increased consistently from 78,089 in 1997 to 973,526 in 2004 and then rapidly to 3,535,631 in 2008 but fell sharply to 1,739,365 in 2009 as an result of the crash in the global financial markets. After temporary increase in 2010, number of deals declined consistently to 1,147,626 in 2012.

Further examination of data in table 3 showed that value of transaction has exhibited fluctuating trend throughout the evaluation period. Value of transaction fell initially from N388.70 million in 1980 to N215.00 million in 1982 and thereafter fluctuated between N225.40 million and N850.30 million from 1983 to 1992. Value of transaction however increased consistently from N804.40 million in 1993 to N1,679,143.70 million in 2008 before plunging deep to N685,717.30 million in 2009 but fluctuated between N799,910.90 million and N808,994.35 million from 2010 to 2012.

In the similar manner, industrial output showed some fluctuating trend during the evaluation period. As shown in table 3, industrial output fell from N20,174.65 million in 1980 to N13,596.81 million in 1983 but thereafter rose from N14,470.76 million in 1984 to N18,226.39 million in 1985. After a brief fall to N16,392.87 million in 1986, industrial output rose consistently from N34,477.32 million in 1987 to N1,215,912.20 million in 1997 but fell sharply to N882,034.02 million in 1998 before fluctuating between 1999 and 2001. Beginning from 2002, industrial output increased consistently from N2,042,716.43 million in 2002 to N16,263,083.56 million in 2011 but fell moderately to N15,825,475.71 million in 2012. Statistics from table 3 above showed that gross domestic investment fell sharply from ₦60,428.00 million in 1980 to N8,799.48 million in 1985. However, gross domestic investment was in consistent increase from 1986 to 2003. In absolute terms, gross domestic investment rose from ₦11,351.46 million in 1986 to ₦865,876.46 million in 2003 but thereafter declined gradually to N804,400.82 million in 2005. Further increases in domestic investment were also recorded between 2006 and 2010. In absolute terms, gross domestic investment increased from ₦1,546,525.65 million in 2006 to ₦4,007,832.32 million in 2010 but fell to ₦3,357,397.77 million in 2012.

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Data as shown in table 3 above revealed that exchange was relatively fixed between 1980 and 1985. In 1980, exchange rate was N0.55 to US$1 but fell gradually to N0.89 to US$1 in 1985. Following the liberalization of the Nigerian economy in 1986, as a result of the implementation of structural adjustment programme (SAP), exchange rate depreciated. By 1991, the exchange rate had depreciated to N9.91 to US$1, and depreciates sharply to N17.30 to US$1 in 1992. The rate further depreciates to N92.69 to US$1 in 1999, N102.11 to US$1 in 2000, N132.15 to US$1 in 2005, N150.66 to US$1 in 2010 before reaching the height of N158.27 to US$1 in 2011. By 2012, exchange rate in Nigeria stood at N157.50 to US$1.

Finally, information as contained in table 3 showed that real gross domestic product rose sharply from N31,546.76 million in 1980 to N205,222.06 million 1981 but fell consistently to N183,562.95 million 1984 and thereafter increased consistently from N201,036.27 million in 1985 to N267,549.99 million in 1990. After a temporary fall in 1991, real gross domestic product increased consistently from N274,833.29 million to N888,893.00 million in 2012.

Table 3: Trend Analysis of Selected Macroeconomic Variables

YEAR	MCAP	NDEALS	VTRAN	INDOUT	EXCH	GDI	RGDP
1980	5.00	7,138.00	388.70	20,174.65	0.55	60,428.00	31,546.76
1981	5.00	10,199.00	304.80	15,802.63	0.61	18,220.59	205,222.06
1982	5.00	10,014.00	215.00	14,424.70	0.67	17,145.82	199,685.25
1983	5.70	11,925.00	397.90	13,596.81	0.72	13,335.33	185,598.14
1984	5.50	17,444.00	256.50	14,470.76	0.76	9,149.76	183,562.95
1985	6.60	23,571.00	316.60	18,226.39	0.89	8,799.48	201,036.27
1986	6.80	27,718.00	497.90	16,392.87	2.02	11,351.46	205,971.44
1987	8.20	20,525.00	382.40	34,477.32	4.02	15,228.58	204,806.54
1988	10.00	21,560.00	850.30	41,200.31	4.54	17,562.21	219,875.63
1989	12.80	33,444.00	610.30	89,596.71	7.39	26,825.51	236,729.58
1990	16.30	39,270.00	225.40	115,591.37	8.04	40,121.31	267,549.99
1991	23.10	41,770.00	242.10	136,627.70	9.91	45,190.23	265,379.14
1992	31.20	49,029.00	491.70	274,755.29	17.30	70,809.16	271,365.52
1993	47.50	40,398.00	804.40	282,305.87	22.05	96,915.51	274,833.29
1994	66.30	42,074.00	985.90	283,563.10	21.89	105,575.49	275,450.56
1995	180.40	49,564.00	1,838.80	873,884.71	21.89	141,920.24	281,407.40
1996	285.80	49,515.00	6,979.60	1,293,225.62	21.89	204,047.61	293,745.38
1997	281.90	78,089.00	10,330.50	1,215,912.20	21.89	242,899.79	302,022.48
1998	262.60	84,935.00	13,571.10	882,034.02	21.89	242,256.26	310,890.05
1999	300.00	123,509.00	14,072.00	1,179,551.18	92.69	231,661.69	312,183.48
2000	472.30	256,523.00	28,153.10	2,359,313.33	102.11	331,056.73	329,178.74
2001	662.50	426,163.00	57,683.80	1,874,082.94	111.94	372,135.65	356,994.26
2002	764.90	451,850.00	59,406.70	2,042,716.43	120.97	499,681.53	433,203.51
2003	1,359.30	621,717.00	120,402.60	3,037,706.29	129.36	865,876.46	477,532.98
2004	2,112.50	973,526.00	225,820.00	4,610,083.70	133.50	863,072.62	527,576.04
2005	2,900.10	1,021,966.60	262,935.80	6,094,891.34	132.15	804,400.82	561,931.39
2006	5,121.00	1,367,954.00	470,253.40	7,488,743.54	128.65	1,546,525.65	595,821.61
2007	13,294.60	2,615,020.00	1,076,020.40	8,085,380.04	125.83	1,915,348.83	634,251.14

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2008	9,562.99	3,535,631.00	1,679,143.70	9,719,513.85	118.57	2,030,510.02	672,202.55
2009	7,030.84	1,739,365.00	685,717.30	8,071,070.58	148.90	3,048,023.41	718,977.33
2010	9,918.21	1,925,478.00	799,910.90	15,194,561.13	150.30	4,007,832.40	776,332.21
2011	9,672.65	1,235,467.00	638,925.70	16,263,083.56	153.86	3,908,280.32	834,161.83
2012	14,800.90	1,147,626.00	808,994.35	15,825,475.71	157.50	3,357,397.77	888,893.00

Source: Central Bank of Nigeria Statistical Bulletin, 2012

5.4 Unit Root Tests

The results of the unit root tests employing the Augmented Dickey-Fuller test and Phillips-Perron tests are presented in table 3 and table 4 below. The results of the unit root test using both the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test as shown in table 3 and table 4 below revealed that no variable was stationary at levels. Hence, the null hypothesis of non-stationarity cannot be rejected at levels. However, at first difference, all variables were stationary. That means at first difference the variables were integrated of order I(1).

Table 3: Test for Unit Root using Augmented Dickey-Fuller (ADF) Test

Variable	ADF Test Statistic		Order of Integration
	Level	1st Difference	
INDOUT	-1.065308	-7.046363	I(1)
RGDP	5.949494	-6.987222	I(1)
MCAP	0.499617	-4.388882	I(1)
NDEALS	-1.257235	-4.446932	I(1)
VTRAN	-1.457728	-6.208830	I(1)
EXCH	0.032010	-5.294079	I(1)
GDI	-0.378130	-3.415763	I(1)

Test critical Values at Level: 1%= -3.653730, 5%= -2.957110, 10%= -2.617434

Test critical Values at 1st Diff: 1%= -3.661661, 5%= -2.960411, 10%= -2.619160

Source: Researcher's Computation

Table 4: Test for Unit Root using Phillips- Perron (PP) Test

Variable	ADF Test Statistic		Order of Integration
	Level	1st Difference	
INDOUT	-0.937011	-7.901684	I(1)
RGDP	1.298118	-6.036254	I(1)
MCAP	1.575031	-5.590767	I(1)
NDEALS	-1.472099	-5.732617	I(1)
VTRAN	-1.308199	-7.520793	I(1)
EXCH	0.032010	-5.294079	I(1)
GDI	0.685641	-3.032868	I(1)

Test critical Values at Level: 1%= -3.653730, 5%= -2.957110, 10%= -2.617434

Test critical Values at 1st Diff: 1%= -3.661661, 5%= -2.960411, 10%= -2.619160

Source: Researcher's Computation

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Co-integration Test

Having established that the variables are integrated of order I(1), suggests that there is a long run equilibrium relationship among the variables. The existence of this long run relationship was tested using Johansen multivariate co-integration analysis based on trace test and maximum eigenvalue test. The results of the cointegration analysis are presented in table 5 below.

Table 5: Results of the Co-integration Test

	Trace Test			**Maximum Eigenvalue Test**		
Hypothesized No. of CE(s)	Trace Statistics	0.05 Critical Value	Prob.**	Max-Eigen Statistics	0.05 Critical Value	Prob.**
None *	650.6819	125.6154	0.0001	214.9612	46.23142	0.0000
At most 1*	435.7208	95.75366	0.0001	167.9908	40.07757	0.0001
At most 2*	267.7300	69.81889	0.0000	135.7448	33.87687	0.0000
At most 3*	131.9852	47.85613	0.0000	70.73485	27.58434	0.0000
At most 4*	61.25032	29.79707	0.0000	33.74760	21.13162	0.0005
At most 5*	27.50272	15.49471	0.0005	23.09875	14.26460	0.0016
At most 6*	4.403977	3.841466	0.0358	4.403977	3.841466	0.0358

Series: INDOUT RGDP MCAP NDEALS VTRAN EXCH GDI
Trace test and Maximum Eigenvalue test indicate 7 cointegrating equations at 0.05 level
*Denotes rejection of hypothesis at the 0.05 level.
** Mackinnon-Haug-Michelis (1999) p-values

The results of the cointegration test as presented in table 5 above, using trace test and maximum eigenvalue test revealed seven cointegrating equations at five per cent level. This is because the trace and maximum Eigenvalue tests values in each of the seven co-integrating equations are all greater than their critical values at 5 per cent level of significance. Thus, we can conclude that the variables are co-integrated and hence the presence of long run relationship among them.

The Granger Causality Test

Since it is established that there is a long run relationship among the variables in the model, we proceed to conduct a causality test aimed at establishing the direction of causality among the variables of interest. The granger causality test is based on Engle and Granger (1987) pairwise granger causality test. The results of the granger causality test are presented in table 6.

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Table 6: Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
MCAP does not Granger Cause INDOUT	32	2.91205	0.0986
INDOUT does not Granger Cause MCAP		3.69935	0.0643
VTRAN does not Granger Cause INDOUT	32	2.21200	0.1477
INDOUT does not Granger Cause VTRAN		4.61643	0.0401
NDEALS does not Granger Cause INDOUT	32	3.75328	0.0625
INDOUT does not Granger Cause NDEALS		3.53267	0.0703

Source: Authors' Computation

The results of the granger causality test as presented in table 6 showed that there is a bi-directional relationship between industrial output and market capitalization and between industrial output and number of deals. This means that the development in the stock market in terms of market capitalization and number of deals granger cause industrial sector development and a feedback effect from industrial sector development to stock market development in Nigeria. However, the results of the granger causality test showed that there is a unidirectional causality relationship running from industrial sector development to value of transaction.

The Results of the Short Run Dynamics

The results of the error correction model for short run dynamics are presented in table 7 below.

Table 7: Short Run Estimates

Dependent Variable: D(INDOUT)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	644.6102	1700.752	0.379015	0.7080
D(RGDP)	0.317409	0.036790	8.627541	0.0000
D(MCAP)	1.398420	0.687976	2.032659	0.0533
D(NDEALS)	0.038825	0.010926	3.553335	0.0016
D(VTRAN)	-0.083413	0.021454	-3.888029	0.0007
D(EXCH)	-186.5463	94.65148	-1.970876	0.0604
D(GDI)	-0.019201	0.004537	-4.232140	0.0003
ECM(-1)	-1.023919	0.198343	-5.162356	0.0000

R-squared	0.863341	Mean dependent var	4751.948
Adjusted R-squared	0.823482	S.D. dependent var	15510.54
S.E. of regression	6516.599	Akaike info criterion	20.61441
Sum squared resid	1.02E+09	Schwarz criterion	20.98084
Log likelihood	-321.8306	Hannan-Quinn criter.	20.73587
F-statistic	21.65998	Durbin-Watson stat	1.846305
Prob(F-statistic)	0.000000		

Source: Authors' Computation

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The results of the short run estimates as presented in table 7 above showed that the error correction variable has the correct negative sign and it's statistically significant as theoretically expected. The error correction coefficient of 1.02 showed that about 102 per cent of the deviation from equilibrium is corrected each year. This shows a very rapid speed of adjustment from short run disequilibrium to long run equilibrium. The high values of R-squared of 0.86 and adjusted R-squared of 0.82 showed that the estimated short run model has a good fit and a very high explanatory power. Specifically, the adjusted R-squared of 0.823 showed that about 82 percent of the total variation in the industrial output has been explained by variations in its determinants. In similar manner, the high value of F-statistics of 21.66 showed that the estimated short run model is statistically significant. This means that the independent variables have a joint effect on the dependent variable. The Durbin-Watson statistics value of 1.85 showed that there is no autocorrelation in the model. This means that the residuals are not correlated and hence the model is well-behaved.

Analysis of the short run coefficients showed that real gross domestic product, market capitalization and number of deals have positive and significant impact on industrial output as theoretically expected. From the results, a N1 million increase in real gross domestic product led to an increase in industrial output by N0.32 million in Nigeria, ceteris paribus. Similarly, a N1 million increase in market capitalization and a one unit increase in number of deals brought about an increase in industrial output by N1.40 million and N0.04 million in Nigeria, respectively. As also expected, exchange rate has a significant negative relationship with industrial output in Nigeria. This implies that the appreciation of the exchange rate makes the import of industrial inputs dearer, leading to a decline in industrial output.

Contrary to expectation, value of transaction has a negative relationship with industrial output in Nigeria. This means that funds mobilized in the stock market has not been efficiently utilized for industrial production in Nigeria. From the result, a N1 million increase in value of transaction led to a decrease in industrial output by N0.08 million. The result also revealed that there is a negative and significant relationship between gross domestic investment and industrial output in Nigeria. This result is not however consistent with theoretical expectation, suggesting that there has not been enough domestic investment arising from low levels of savings. From the result, a N1 million increase in gross domestic investment led to a decrease in industrial output by N0.02 million, during the evaluation period.

CONCLUSION AND RECOMMENDATIONS

This study was carried out to empirically examine the relationship between capital market and industrial sector development in Nigeria. There is a widely held argument that efficient functioning of capital market is a pre-requisite for industrial development because it helps in mobilizing funds needed for investment in various industries in an economy. Whether this assertion holds using Nigerian data was the major objective of this study. From the results

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obtained, it was found that capital market has positive and significant impact on industrial output in Nigeria via market capitalization and number of deals. On the other hand, value of transaction has negative and significant impact on industrial output in Nigeria during the evaluation period. The results also showed that real gross domestic product has a positive and significant impact on industrial output in Nigeria, while exchange rate and gross domestic investment have negative and significant relationship with industrial output in Nigeria.

Based on the results obtained, the study recommends that the government should implement appropriate reform policies aimed at ensuring efficiency in the workings of the stock market in Nigeria. The government through the Nigerian stock exchange should also reduce the cost of raising capital by firms on the stock as high cost and other bureaucratic delays could limited the use of capital market as veritable source of raising funds for investment.

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