Evidence on the Dynamic Relationship between Stock Market All Share Index and Gross Fixed Capital Formation in Nigeria

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Abstract*: This study examines the dynamic relationship between Stock Market All Share Index and Gross Fixed Capital Formation in Nigeria. Annual data on market capitalization, value of shares traded, all share index, average prime lending rate, inflation rate, national savings and gross fixed capital formation at current purchaser's value from 1980 to 2012 were sourced from the statistical bulletin of the Central Bank of Nigeria and the Nigerian Stock Exchange Fact Book various issues. The ordinary least square (OLS) regression technique was employed in the data analysis and the error correction mechanism (ECM) was used to study the short-run dynamics as well as long-run relationship between the stock market and gross fixed capital formation in Nigeria. The result revealed that all share index of the Nigerian stock market has significant effect on gross fixed capital formation. It further shows that though the capital market has the potential of influencing gross fixed capital formation its' effect has not been fully realized due to illiquidity and low level of development of the Nigerian capital market. It is recommended that appropriate policy measures been taken to deepen the market and strengthen the structure of the market to ensure that long term funds are used to finance long-term investments.*
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I. Introduction

The general theme of capital formation lies at the very centre of the problem of development in developing countries. The so-called developing countries, as compares with developed countries, are less equipped with capital in relation to their population and natural resources.

Gross fixed capital formation is essentially net investment. It is a component of the Expenditure method of calculating gross domestic product. To be more precise Gross fixed capital formation measures the net increase in fixed capital.

Gross fixed capital formation includes spending on land improvements (Fences, ditches, drains, and so on); plant, machinery, and equipment purchases; the construction of roads, railways, private residential dwellings, and commercial and industrial buildings. Disposal of fixed assets is taken away from the total.

Gross Fixed Capital Formation can be classified into gross private domestic investment and gross public domestic investment. The gross private domestic investment is equivalent to gross fixed capital formation plus net change in the level of inventories. The gross public investment includes investment by government and public enterprises.

Economic theory as well as empirical experience confirm that the significant differences in the level of economic development and rates of economic growth among countries or in the same country over time are, to a great extent, interrelated with the differences that exist in the level and composition of the capital stock, Bakare (2011). Ideally, capital stock is build-up by the accumulation of capital assets regularly done. Therefore economists have for a long time used the estimate of capital formation as well as capital stock in their analysis of the results of productive activity. Estimate of the gross stock of capital assets and capital formation are frequently used in determining the magnitude of and changes in productive capacity.

According to Al-Faki (2006), the capital market is a network of specialized financial institutions, series of mechanisms, process and infrastructure that in various ways, facilitate the bringing together of suppliers and users of medium to long-term capital for investment in developmental projects.

The primary aim of the Nigerian capital market is therefore to mobilize long-term funds from individuals, investors and corporate bodies and channel the funds to productive activities for economic advancement. The Nigerian Stock Exchange (NSE) is the centre point of the capital market while the security and Exchange commission (SEC) serves as the apex regulatory body. To enable small as well as large-scale enterprises gain access to public listing, the NSE operates the main Exchange for relatively large enterprises,

and the Second – Tier Security Market (SSM) where listening requirements are less stringent for small and medium – scale enterprises.

The importance of the capital market lies in its financial intermediation role of linking the deficit unit with the surplus unit of any economy. The inability of the capital market to perform this role deprives the economy of much needed financial resources for investment and production of goods and services, (Ewah *et al.,* 2009; Odili and Ezeudu, 2014). The capital market was therefore constituted or established to facilitate the mobilization and channeling of funds into productive investments.

Osaze (2000), sees the capital market as the driver of any economy to growth and development because it is essential for the long-term growth in gross fixed capital formation. It is critical in fund mobilization and allocation for profitable investment projects and production of goods and services. The institutional framework of the capital market has to be put in place to effectively perform its core function of fund mobilization and allocation to ensure that the expectations of investors and fund users are met to induce savings and capital formation (Oke and Adensi, 2012).

Equity markets in developing countries until the mid – 1980's generally suffered from the classical defects of bank dominated economies that was characterized by shortage of foreign institutional investors, and lack of investors confidence in the stock market (Adebiyi, 2005). Before the eighties, corporate savings were the most important component of gross resource mobilization by the private corporate sector and reliance on external resources was limited. The investment behaviour of a firm depends crucially on its financial structure since apart from technology, managerial and demand problems the only completely exogenous constraint on the diversified firm is the stock market via its impact on company valuation and cost of capital. In a developing country, the constraint is more serious because of imperfections in the capital market. The functioning of the capital market affects liquidity, acquisition of information about firms, risk diversification, savings mobilization and corporate control (Anyanwu, 1998). Altering the quality of these services can alter the rate of economic growth through the functioning of the capital market.

In 1986; Nigeria policy markers pursued a structural adjustment program which shifted emphasis from public sector to private sector. The goal was to encourage private domestic investment and capital formation in order to enhance economic prosperity. This gave birth to privatization and commercialization of state enterprises. But unfortunately, the initial objectives for setting up privatization and commercialization programmes have not been achieved.

Ariyo and Adelegan (2005) contend that the liberalization of capital market led to the growth of the Nigerian capital market but its impact at the macro-economy has been negligible. It is increasingly being recognized that the growth process of the Nigerian economy which depends to a great extent on crude oil revenue and marginally on the provision of long-term funds for gross private domestic and public investment as well as funds for the small and medium – scale enterprises (SMEs) which are the engine of growth in any developing or emerging market economy is very slow. These sectors have been grossly deprived of the need financial resources due to low level of national savings and hence low level of gross fixed capital formation in Nigeria. This study therefore examines the relationship between the all share index of the Nigerian capital market and the gross fixed capital formation and its' effectiveness in mobilizing and allocating financial resources for fixed capital investment. It will seek to resolve the perennial problem of inadequate investment in fixed capital through the capital market. It will also proffer policy recommendations for efficient mobilization and allocation of funds in the Nigerian capital market.

The rest of this paper is organized as follows: Section 2 presents the literature review and theoretical framework. The methodology of the study is discussed in section 3. In section 4, we carry out the data analysis and discuss the findings while section 5, draws conclusion and makes policy recommendations.

II. Theoretical Framework

Gross fixed capital formation consists of additions to the assets of producers of tangible reproducible goods which have an expected lifetime of use of one year or more. The producers in question may be industries, producers of Government services and producers of private non-profit services to household. The capital goods may be purchased or produced on own account. Sales less purchase of second-hand fixed assets and sales of scrapped fixed assets by producers should be deducted from gross fixed capital formation. The development of stock market is necessary to achieve full efficiency of capital formation. Back and Levine (2003) shows that positive link exist between stock market development and capital formation. The stock market assists corporate entities to raise long term funds for investments. The capital market constitutes an important institution for massive financial resources needed for increased fixed capital in the economy.

Capital market according to Ekezie (2002) is the market for dealings (that is, Lending and Borrowing) in long-term loan-able funds. The development of the capital market provides opportunities for greater funds mobilization, improved efficiency in resource allocation and provision of relevant information for appraisal (Inanga and Emenuga, 1997). The cheap source of funds from the capital market remains a critical element in

the sustainable development of the economy (Okereke – Onyiuke, 2000; Odili and Ezeudu, 2014). She enumerated the advantages of capital market financing to include long repayment period as funds are held in medium and long-term basis or in perpetuity, fund to state and local government without pressures and ample time to repay loans.

Mckinnon (1973) theories on finance and development criticized the dominant neo-classical monetary theories and the Keynesian counter arguments. The neo-classical monetary growth models postulate that high – positive interest rate have a direct impact on savings and investment. Within this school of thought, money is regarded as a substitute for physical assets and productive investments. Keynesian economists on the other hand agree that low interest rate increases investment, income and eventually savings.

Pardy (1992), contends that macroeconomic and fiscal environment are the building blocks which determine the success or otherwise of securities market. Conducive macroeconomic environment promotes the profitability of business which propels them to a stage where they can access securities for sustained growth (Akingunola *et al.,* 2012).

Interest rate is a financial price for credit and affects resource allocation, production levels, prices and profitability. Fluctuations in the interest rates reflect in share price. For instance, lowering of interest rate in demand and savings deposits will improve returns to investing on the stock exchange relative to investing in deposit money banks (DMBs) holding factors such as risk, transaction costs etc. constant. This will therefore increase the demand and share price of affected equities on the exchange thereby affecting its performance (Akingunola *et al.,* 2012).

Prime lending rate also has significant effects on stock market prices much in the same way as interest rate: Agenor (2000) captures these views by stating that interest rate, high inflection, large fiscal deficits and real exchange rate over-valuation are often key symptoms of macroeconomic instability which constraints private and public sectors investment and savings and results in inefficient allocation of resources on the exchange thereby affecting its performance.

The theoretical basis for this study is therefore anchored on Harrod – Domar model, which emphasized the key role of investment in economic growth process. It describes the economic mechanism by which more investment leads to more growth. For a country to develop and grow, it must direct part of its resources from current consumption needs and invest them in fixed capital. Diversion of resources from current consumption is called savings. According to Harrod (1960) and Domar (1946) investment creates income (demand effect) and increases the capital stock for expansion of productive base. The model explains a long-run steady state of capital – output and savings – investment flow equilibrium for increased productivity in an economy.

The model holds that national saving(s) mobilization and capital formation in one period (t) is the source of output (y) in the next period (t+1). That is, capacity of the economy for increased productivity in future.

$$I_t - Y_{t+1} > 0 \qquad \text{_____} \qquad (1)$$

$$Y/I > 0 = \text{growth} \qquad \text{_____} \qquad (2)$$

Increase or change in savings – output ratio
ΔS divided by a lower capital - output
ΔY

Ratio $\underline{K}$ or $\underline{\Delta I}$, magnifies economic growth.
$\quad \Delta Y$

In a two sector model $\qquad Y = C + I$
$\qquad\qquad\qquad$:. $\qquad Y - C = I$
$\qquad\qquad\qquad$ Also $\qquad Y = C + S$
$\qquad\qquad\qquad\qquad Y - C = S$

This implies that S = I, savings – investment identity $\qquad$ _____ $\qquad$ (3)
$\underline{S} = \underline{I}$, savings – output ratio $\qquad\qquad\qquad\qquad$ _____ $\qquad$ (4)
Y $\quad$ Y
Investment (I) is defined as the change in capital stock K
$\qquad I = K \qquad\qquad\qquad$ _____ $\qquad$ (5)
Therefore K/Y = I/Y = capital – output

Ratio $\underline{K}$ $\qquad$ _____ $\qquad$ (6)

But since the total stock, K, bears a direct relationship to total national income, or output Y, as expressed by the capital – output ratio K, then it follows that:

K   =   K   _____   (7)

Dividing equation (4) by equation (6) gives the growth rate (g) of the economy

$$G \quad = \quad \frac{s/y}{k/y} \quad = \quad s/y \times y/k = \quad s/k \quad _____ \quad (8)$$

Harrod – Domar model draws from the experience of Keynesian growth model. While the Keynesian model is a short-run analysis, the Harrod – Domar model is a long – run analysis. The demand for invisible financial resources from the capital market is a derived demand for the production of goods and services in the economy. National savings and hence Net Investment (i.e. gross fixed capital formation) is supposed to be proportional to changes in output of the economy.

2.1 Empirical Literature

The role of capital market in corporate fund mobilization seems insignificant and questionable over the years especially in developing and emerging market economies. Levine and Zervos (1998) used pooled crossed country time series regression of 47 countries from 1976 to 1993 to evaluate whether stock market liquidity is related to growth, capital accumulation and productivity. They towed the line of Demiurgue-kunt and Levine (1996) by conglomerating measures such as stock market size, liquidity and integration with world market, into index of stock market development. The rate of Gross Domestic Product (GDP) per capital was regressed on a variety of variables designed to control for initial conditions, political instability, investment in human capital and macroeconomic condition and then included the conglomerated index of stock market development. They found empirically that the measures of stock market liquidity were strongly related to growth, capital accumulation and productivity while stock market size does not seem to correlate to economic growth.

A study by Bencivenga *et al.,* (1996), considered empirically how the efficiency of an economy's capital market or equity market – as measured by the costs of transacting in them – affect the economy's efficiency in producing physical capital and, through this channel, final goods and services. They followed the line of thinking of Hicks (1969) that emphasized the role of equity markets in providing liquidity to holders of long-term and inherently illiquid capital. Their research showed that as the efficiency of an economy's capital market increases (i.e. transaction costs fall) the general effect is to cause agents to make longer-term, and more transactions – intensive investments. This results in a higher rate of return on savings and investments as well as a change in their composition.

Kofi (1998) in his study titled analysis of factors affecting the development of an emerging capital market: The case of the Ghana stock market, established that the Ghanaian capital market has not yet played its role in capital mobilization though if properly organized it could be a source of the much needed capital necessary for economic growth. Engberg (1975) recognized the need for capital markets even for less – developed country. The study contends that capital markets can sufficiently raise the level of domestic savings and contribute to a more efficient allocation of such savings among competing uses.He emphasized that through the capital market, a variety of financial assets, carrying different risks, yield and liquidity is added to the traditional types of financial assets such as demand and savings deposits.

Caporale *et al.,* (2004) in their study provided the evidence that an organized and well managed stock market stimulate investment opportunities by recognizing and financing productive projects that lead to economic activity, mobilize domestic savings, allocate capital efficiently, help to diversify risks, and facilitate exchange of goods and services.

Ezeoha, *et al.* (2009), examined the nature of relationship that exists between stock market development and the level of investment (domestic private investment and foreign private investment) flows in Nigeria. Their finding shows that stock market development contributes positively to domestic private investment but has not significantly contributed to the flow of foreign private investment.

Mishra *et al,* (2010) appraised the effect of capital market efficiency on economic growth in India using multiple regression and time series data on capitalization, total market turnover and stock price index over the period spanning from the first quarter of 1991 to the first quarter of 2010. Their findings show that the capital market in India has the potential of contributing to the economic growth of the economy.

Adeusi, *et al.,* (2013), examined the impact of capital market development on economic growth and development since the liberalization policy in 1986 to 2010 in Nigeria using ordinary least square (OLS) and Johansen co-integration estimation techniques. The result of this findings shows that capital market development has not impacted positively on Nigeria economic growth and development due to the relative small size of the market despite its development as a result of the liberalization policy.

Ajao, (2011) examined the impact of stock market development on capital formation and growth in Nigeria, using a time series data, for the period 1981 to 2009. His result shows that positive and significant relationship exists between gross fixed capital formulation and gross domestic product as well as industrial production index. However, his analysis shows an inverse relationship between gross fixed capital formation and market capitalization as well as new issues of instruments, this indicates that the Nigerian stock market in its many years of existence has contributed marginally to long-term capital formation in Nigeria.

Owolabi and Adegbite (2012) examined the effects of capital market operations on Nigerian economy. Covering the period 1990 to 2010, and Using a multiple regression analysis, Gross Domestic Product, All share index, market Turnover, inflation, Transaction cost, and market capitalization were all found to have significant effects on the Economic Growth with Adjusted R^2 of 99%. They concluded that the Nigerian capital market has tremendous influence on the growth rate of the economy and the performance in terms of capital mobilization and accessibility to savers and users of funds with the aim of mobilizing and allocating productive resources to aid national economic development. This is contrary to the findings of Ewah *et al.,* (2009) who appraised the impact of the capital market efficiency on economic growth of Nigeria using time series data from 1963 to 2004. They found that the capital market in Nigeria has the potential of growth inducing but has not contributed meaningfully to the economic growth of Nigeria because of low market capitalization, illiquidity, misappropriation of funds among others.

Okafor and Arowoshegbe (2011), investigates the Impact of the Nigerian capital market performance on the gross fixed capital formation using ordinary least square (OLS) regression models. The result revealed that due to high level of buy-hold attitude of Nigerian investors, the stock market has not financed significantly the gross fixed capital formation.

The inconsistency in the result of the researchers on the impact of capital market indices on gross fixed capital formation therefore partly motivates the study.

III. Methodology

This study provides empirical evidence on the effectiveness of the Nigeria capital market in mobilizing and allocating funds for fixed capital investment. The data were source from the Central Bank of Nigeria statistical bulletin and the Nigerian stock exchange fact book, various issues. The study hypothesized that the Nigeria's capital market has no significant effect on gross fixed capital formation. The study employed the ordinary least square (OLS) estimation technique to assess the short run effects of the independent variables, market capitalization, value of shares traded, all share index, average prime lending rate, inflation rate and national savings on the dependent variable (GFCF) using an annual time series data from 1980 to 2012. The Augmented Dickey fuller unit root test is used to test the stationarity of the data and Johansen co-integration test to ascertain the long-run equilibrium relationship among variables in the model. Error correction model (ECM) was employed to correct possible problem of non-stationarity of data.

3.1 Model Specification

The model adopted in this study is based on the modification of the model used by Ajao, (2011). Our model specifies the dependent variable (GFCF) as a function of market capitalization, value of shares traded, all share index, average prime lending rate, inflation rate and national savings. Several models have been used to empirically establish the relationship between stock market index and Gross fixed capital formation. They include mean adjusted return, the market model, the modified market model and the Auto-regressive distributive lag (ARDL) model. This study uses a multiple linear regression model due to its predictive and informative ability about the direction of relationship between the dependent and independent variables.

The functional form on which the econometric model is based is given as:

$Y = F(x_1, x_2, x_3, x_4, x_5, x_6)$

Where:

Y is the gross fixed capital formation (GFCF) the depended variables,

X_1 to x_6 are independent variables, F represents the functional notation.

This can be specifically stated as;

GFCF = F (MCAP, VST, ASI, AVPLR, INFR, NS)

The linear regression equation based on the above functional relation is thus:

$$Y = a_0 + a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 + a_5x_5 + a_6x_6 + e \qquad - \qquad \underline{\qquad\qquad} \qquad (1)$$

$$GFCF = a_0 + a_1MCAP + a2VST + a_3ASI + a_4AVPLR + a_5 INFR + a_6NS + e \qquad \underline{\qquad\qquad\qquad} \qquad (2)$$

Where:

GFCG   =   Gross fixed capital formation

MCAP   =   Market capitalization

VST   =   value of share trade
AS1   =   All share index
AVPLR = Average prime lending rate
INFR   = Inflation rate
NS   =   National savings
a_o =   Intercept of relationship in the model/constant
a_1 to a_6 =   Coefficient of each of the independent variables
e   =   Stochastic disturbance (Error Term). By log Linearization, the model becomes

$Log(GCFC) = a_0 + a_1 Log(MCAP) + a_2 log(VST) + a_3 log(ASI) + a_4 Log(AVPLR) + a_5 log(INFR) + a6 Log(NS) + e$ _____   (3)

Where:
Log = Natural Log
From Equation 3, the model can be specified in a time series form as:

$Log(GFCF)_t = a_o + a_1 Log(MCAP)_t + a_2 log(VST)_t + a_3 log(ASI)_t + a_4 log (AVPLR)_t + a_5 log(INFR)_t + a_6 Log(NS)_t + e_t$ _____   (4)

A prior expectation

Our *a prior* expectation is that MCAP, VST, ASI, and NS have direct   relationship with GFCF while INFR and AVPLR have inverse relationship with GFCF. This can be expressed mathematically as:

$a_1, a_2, a_3, a_4, a_6 > 0$, while, $a4, a5 < o$.

IV.   Data Analysis And Interpretation Of Results

The descriptive statistics over the sample period which are expressed in Nigerian currency are reported in table 4.1. The Gross domestic product (GDP), range from 139,085.3 to 29,205312. The data showed a progressive increase in GDP within the period investigated with annual average of 8,022,540. The all share index range from 233.60 to 57990.20. Over this period all share index averaged 1,320.27 while the time series data is approximately symmetric with skewness and kurtosis of 1.05 and 2.69 respectively.
Accordingly, Jarque-Bera statistic shows that the data is not significantly difference from a normal series.

Table 4.1 Descriptive Statistics of all variables

	GDP	MCAP	VST	ASI	AVPLR	INFR	NS
Mean	8022540	2379007.	314041.2	13203.27	22.35217	1130.243	1130.243
Median	3194015	300000.0	14027.40	6992.100	12.90000	277.7000	277.7000
Maximum	29205312	13294600	2379143.	57990.20	72.80000	6183.800	6183.800
Minimum	139085.3	10000.00	136.2000	233.6000	6.600000	23.20000	23.20000
Std. Dev.	9266172.	3863476.	647137.8	14403.71	19.51875	1822.321	1822.321
Skewness	1.054184	1.664839	2.421268	1.455689	1.274815	1.882585	1.882585
Kurtosis	2.686306	4.470484	7.655499	5.110959	3.348181	5.227660	5.227660
Jarque-Bera	4.354301	12.69703	43.24366	13.74924	6.345929	18.34152	18.34152
Probability	0.113364	0.001749	0.000000	0.001034	0.041879	0.041879	0.000104
Observations	23	23	23	23	23	23	23

Unit Root Test

The first stage is to test for the stationarity properties of the variables by employing the unit root test. Non-stationary data produces spurious regression hence the result may be misleading. The Augmented Dickey-Fuller (ADF) Unit root test is used to establish stationarity of data. The decision rule is that the ADF test statistic value must be greater than the Mackinnon critical value at 5% in absolute terms.
The table below shows the summary of unit root test conducted on the parameter at level.

Table 4.2 ADF Unit Root Test at Level

Variables	ADF Test Statistic Value	Mackinnon critical value at 5%	Remark
Y1	1.801832	-3.0114	Presence of unit Root
X1	-0.471301	-3.0114	Presence of unit Root
X2	-2.043914	-3.0114	Presence of unit Root
X3	-1.363503	-3.0114	Presence of unit Root
X4	-2.242906	-3.0114	Presence of unit Root
X5	-2.361789	-3.0114	Presence of unit Root
X6	-1.876434	-3.0114	Presence of unit Root

From the Table above, it can be deduced that all the variables are non-stationary because they have their Augmented Dickey Fuller (ADF) statistic less than Mackinnon critical value at 5%. This led to the testing for stationarity at first difference.

Table 4.3: ADF Unit Root Test at First Difference

Variables	ADF Test Statistic Value	Mackinnon critical Value at 5%/10%	Remark
Y1	-4.549685	-3.0294/ -2.6502	No Unit root
X1	-4.673951	-3.0294/ -2.6502	No Unit root
X2	-6.762005	-3.0294/ -2.6502	No Unit root
X3	-4.562377	-3.0294/ -2.6502	No Unit root
X4	-5.821030	-3.0294/ -2.6502	No Unit root
X5	-3.924789	-3.0294/ -2.6502	No Unit root
X6	-2.694784	-3.0294/ -2.6502	No Unit root
ECM	-4.3858	-3.0294/-2.6502	No unit root

All the variables are stationary at first difference because they have their respective ADF statistics greater than Mackinnon critical value at 5%. Except National savings that is stationary at 10%. It also shows that the variables are co-integrated in the same order.

Co-integration

The essence of co-integration test is to ascertain if a long-run equilibrium relationship exist among variables of the model.

Decision Rule: The trace statistic must be greater than 5% critical ratio at one Hypothesized (None**)
The table below shows the summary of result from analysis conducted on the specified model.

Table 4.4:   Presentation Of Johansen Co-integration Result

Series: GFCF, MCAP, VST, ASI, AVPLR, INFR, NS

Lags Interval: 1 to 1

Eigen value	Trace statistic	5percent critical value	1percent critical value	λ max	5% critical value	1% critical value	Hypothesized No. of CE(s)
0.968326	143.37467	124.24	133.57	59.80161	45.28	51.57	None **
0.959097	106.53483	94.15	103.18	48.94153	39.37	45.10	At most 1 *
0.876953	78.78325	68.52	76.07	34.67835	33.46	38.77	At most 2
0.674176	55.20112	47.21	54.46	28.20143	27.07	32.29	At most 3
0.550305	23.14314	29.68	35.65	17.34568	20.97	25.52	At most 4
0.545007	8.30467	15.41	20.04	6.44307	14.07	18.63	At most 5
0.945061	0.89316	3.76	6.65	0.79326	3.76	6.65	At most 6

Trace and max-eigen value tests indicates 4 cointegrating equation at the 0.05 level.

*denotes rejection of the null hypothesis at the 0.05 level. The first row of the trace tests, shows a statistics of 143.37467 which considerably exceeds the critical value at 95 percent and so the null of no cointegrating vectors is rejected. This continues, until we do not reject the null hypothesis of at most four cointegrating vectors at 5% level. The max text confirms this result. The co-integration equation is specified below:

$$GFCF = 66502 - 0.02MCAP - 0.65VST + 41 ASI - 6836.28AVPLR$$
$$(0.0763) \quad (0.2105) \quad (10.4386) \quad \quad (12222.51)$$
$$+ 896.72 \ INFR + 559.00NS$$
$$(3081.41) \quad \quad \quad (74.70)$$

The standard error statistics are in parenthesis.

It can be deduced from the result that the constant parameter in the long-run is positive. This implies that if all the explanatory variables are held constant, GFCF will increase by 66502 units. The result also indicates that coefficient of MCAP is negative (-0.02). This implies that there exist, a negative relationship between MCAP and GFCF in the long-run. A 1% increase in MCAP leads to a decrease in GFCF by 2.0%. Likewise the coefficient of NS and AVPLR are -0.65, and -6836 respectively. This implies that each of these variables share a negative relationship with GFCF in the long-run. Any attempt to increase any of them in the long-run will lead to a decrease in GFCF. ASI, INFR and NS indicate a coefficient of 40.99, 892.72, and 556.80 respectively. This implies that there exists, a positive relationship between ASI, INFR, NS and GFCF in the long-run. An increase in any of these variables will lead to an increase in GFCF. Multiple correlation coefficient (R), of 0.984243364 indicates a strong positive linear relationship between the independent variables and the dependent variables since the value is close to 1. R^2 with a value of 0.968735 indicates that about 96.87% of the variation in the dependent variables is due to MCAP, VST, ASI, AVPLR, INFR and NS. From the F-distribution table, the critical value obtained at $\alpha = 0.05$, d.f.n = 6, and d.f.d = 22 is 2.53. Since F (=82.6249) is

greater than the critical value (=2.44), and also since, the P-value (=0.000) is less than α (=0.05), it implies that there is a significant relationship between the dependent variable GFCF and the six independent variables in the long run.

ERROR CORRECTION MODEL (ECM)

Given the presence of co-integration, we estimated an ECM of the form in Equation 5 in order to tackle the problem of spurious regression. The attractiveness of the ECM is that it provides a framework for establishing links between the short-run and long-run approaches to econometric modeling.

$$\Delta log(GFCF)_t = a_0 + \sum_{i=0}^{n} Q_1 \Delta log\,(GFCF)_{t-1} + \sum_{i=0}^{n} a_1 \Delta log\,(MCAP)_{t-1}$$

$$+ \sum_{i=0}^{n} a_2 \Delta log\,(VST)_{t-1} + \sum_{i=0}^{n} a_3 \Delta log\,(ASI)_{t-1} + \sum_{i=0}^{n} a_4 \Delta log\,(AVPLR)_{t-1}$$

$$+ \sum_{i=0}^{n} a_5 \Delta log\,(INFR)_{t-1} + \sum_{i=0}^{n} a_6 \Delta log\,(MS)_{t-1} + \lambda\ ECM + e_t \quad\underline{}\quad (5)$$

The error correction mechanism involves developing two models: the over-parameterized model (ECM1) and the parsimonious model (ECM2). ECM1 involves leading and lagging of the variables while ECM2 introduces short-run dynamism into the long-run equilibrium.

Table 4.5: Over – Parameterized error correction mechanism (ECM1)

Dependent variable: D (GFCF$_2$)

Variable	Coefficient	Std. error	t-statistic	Prob.
D(GFCF(-1),2)	-1.6922	0.3719	-4.5496	0.0003
D(MCAP 2)	-0.7889	0.5573	-1.4155	0.0850
D(MCAP(-1),2)	-0.9109	0.4840	-1.8820	0.0314
D(VST 2)	4.6642	3.0652	1.5217	0.3765
D(VST(-1),2)	1.2497	2.4108	0.5184	0.0006
D(ASI 2)	9.6509	49.546	0.1948	0.0025
D(ASI(-1),2)	13.2251	43.9816	0.3007	0.1008
D(AVPLR 2)	-3396.37	858479	-0.39563	0.0265
D(AVPLR(-1),2)	-2605.03	8517.11	-0.30585	0.0296
D(INFR 2)	277.209	2615.37	0.1059	0.9750
D(INFR(-1),2)	1006.91	3025.70	0.3328	0.3058
D(NS2)	1666.09	1090.67	1.5276	0.2502
D(NS(-1),2)	-738.14	1299.64	-0.5680	0.0588
ECM (-1)	-0.82193	0.38952	-5.7430	0.0467
C	66502.02	299038.3	0.222386	0.8268
R^2	0.634265			
Adjusted R^2	0.588548			
F – Statistic	13.87376 (0.000320)			
Durbin-Watson	2.249460			
S.E of Regression	293382.9			

Table 4.6: Parsimonious error correction model (ECM2)

Dependent Variable: D (GFCF 2)				
Variable	Coefficient	Std. Error	T-Statistic	Prob.
D(GFCF(-1),2	0.6006	0.29000	2.070916	0.0549
D(MCAP (-1),2	-0.017714	0.076253	-0.232311	0.8192
D(VST, 2)	-0.649683	0.210481	-3.086666	0.0071
D(ASI(-1), 2)	40.99254	10.43856	3.927030	0.0012
D(AVPLR,2)	-6836.282	12222.51	0.559319	0.5837
D(IMFR(-1),2)	896.7215	3081.411	0.291010	0.7748
D(NS,2)	559.9969	74.70051	7.496561	0.0000
ECM (-1)	-0.83181	0.41092	-5.87324	0.0027
R^2	0.968735			
Adjusted R^2	0.957010			

F-statistic	82.6249(0.000)
D-W Statistic	2.047899
S.E of Regression	232447.7
AIC	27.79651
SIC	28.14209

The regression results shows that the speed of adjusted on the ECM term is significant at 1% and carries the expected negative sign. The coefficient (λ) shows that 83.2% of the adjustment to equilibrium condition occurs within the first period. This implies that the present value of GFCF adjust rapidly to changes in MCAP, VST, ASI; AVPLR, INFR and NS. The lagged value of ECM given also shows an adjustment of 83.2% from the previous period disequilibrium of the present level of GFCF in the determination of causality between the past level of GFCG and the present and past level of the explanatory variables.

Implications of Findings

The implication of some of the explanatory variables is to tell their effect on Gross fixed capital formation in Nigeria through the stock market.

MCAP and VST are negatively related to GFCF. This implies that as MCAP and VST increases, the GFCF reduces in the short and long run. This is due to the fact that market capitalization and VST increases as total new issues increases as a result of increased domestic savings being channeled into short-term investments instead of long term (fixed capital) investments. Improved liquidity in the secondary market is needed for Gross fixed capital formation rather than increase in market capitalization and the value of shares traded. All share index and inflation are positively related to Gross Fixed Capital Formation in the long run. This implies that as the ASI and INFR increases the GFCF also increases. The implication of this is that the increase in transactions in the Nigeria Stock Exchange which lead to the positive relationship in the GFCF is largely due to speculative reasons rather than long term investment in capital projects and fixed assets thereby necessitating positive relationship between inflation and Gross fixed capital formation.

Average prime lending rate is negatively related to the gross fixed capital formation. This implies that as AVPLR decreases the GFCF increases. This is in line with a prior expectation and theoretical postulations. Low cost of capital encourages long term investment especially in capital projects and fixed assets.

Lastly the national savings is positively related to the gross fixed capital formation. An increase in national savings leads to an increase in GFCF in the short and long run. Theoretically, capital accumulation reduces cost of capital (interest rate) and encourages investment especially in fixed capital.

V. Conclusion And Recommendations

This study analyses the dynamic relationship between all share index of Nigeria's capital market and gross fixed capital formation. The result of the error correction model corroborates the theoretical predictions of the relationship between stock market and the gross fixed capital formation. The level of national savings, Average prime lending rate and all share index are correctly signed and in line with the theory while value of shares traded, inflation and market capitalization though showed significant relationship with gross fixed capital formation, were inversely related.

The speed of adjustment on the ECM term was significant at 1% and carries the expected negative sign.

The findings have significant policy implications in relations to fund mobilization and allocation function of the stock market. The results revealed that most funds mobilized in the capital market were invested in short term investment projects. Long term funds are used to finance short term investments and this lead to the significant negative relationship between market capitalizations, value of shares traded and gross fixed capital formation. Given the fact that capital market investors in Nigeria are speculative in nature and adopt the attitude of buy and hold instead of trading on shares, inflation also recorded positive and significant relationship with gross fixed capital formation.

Optimal policy measures are therefore required to manage fund mobilization and allocation in the Nigerian stock market to ensure that long-term funds are employed in long-term investment. In line with this, the results also suggest the need for policy makers to design policies that will deepen capital market and strengthen the structure to increase the liquidity of the market and to provide the needed financial resources to finance fixed capital investments.

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