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Capital Market Predictive Power on the Development of the Nigerian Economy: An Impulse Response and Variance Decomposition Approach

Ihezukwu, V. A. [α] & Uche Emmanuel [σ]

Abstract- The study investigates the contributions of Nigeria's capital market to the development of Nigeria economy. Most researchers focused on the capital market and growth nexus, while we deviated by focusing on the role played by the capital market in ensuring the reduction of unemployment and poverty in Nigeria. Specifically, we investigated the contributions of market capitalization (MCAP), the value of share traded (VST), and all share index (ASI) to the unemployment rate (UNPR) and poverty (NPI) reductions in Nigeria within the period 1981 to 2017. The data series used was obtained from the annual statistical bulletin of the central bank of Nigeria (CBN) and Nigeria stock exchange (NSE). Preliminary analyses of stationarity and cointegration tests revealed that the series was non stationary at levels, and cointegrated, respectively. The result of the impulse response functions (IRF) and variance decompositions from the two models considered revealed that the contributions of the capital market to poverty reduction in Nigeria is highly insignificant, while it contributes marginally to unemployment reductions in Nigeria within the study period. Conclusively, the research reveals that the Nigeria capital market is not contributing optimally to the development of Nigeria's economy as this is evident in its abysmal contributions to poverty and unemployment reductions. In line with the findings of this work, we recommend that the Nigeria capital market is repositioned in a way that it can optimally contribute to the reduction of unemployment and poverty in Nigeria.

Keywords: capital market, sustainable development, impulse response function, variancede composition.

I. Introduction

a) General background

The importance of the Capital market on the overall development of the Nigerian economy cannot be neglected. This is because the capital market in the recent past had played major roles as an institution that contributes significantly to the socio-economic growth and development of many economies (Bassey, 2009).A growing economy is said to experience development in areas of employment and poverty levels when factors that accelerate growth are recognized. The availability of fund as one of such economic factors for investment is acknowledged. Though commercial banks are expected to provide necessary funds for private investors, yet it is only for short terms periods. Investors, therefore need an institution that will provide funds for long periods for which banks are incapable of undertaking.

Hence, the capital market is a market for long term securities, including the stock and the bonds market. The Capital market provides funds which enable government and firms to raise long-term capital for financing new projects or expanding and modernizing industrial concern. It is therefore, an economic institution that promotes efficiency in capital formation and allocation since funds are taken from surplus economic units to deficit units for investment purposes (Osaze, 2007).Suffice it to say that if funds are not provided to those productive units, the rate of expansion of the economy will lag; this is because it is the capital resource gap that leads to external borrowing (Okpara, 2012).

The Capital market in Nigeria is classified into two; primary and secondary markets. The primary market being a market for trading newly issued securities while the Secondary markets trade on old or already existing securities. Major institutions involved in the capital market are; the Securities and Exchange Commission (SEC) as a regulatory body, the Nigerian Stock Exchange, Brokerage houses, Issuing houses, Unit trusts, etc. The growth and development of the Nigerian capital market could be traced back to late 1950s when the Federal Government, through its ministry of industries, set up the Babcock Committee, saddled with the responsibilities of setting up modalities for the establishment of a stock market in Nigeria. Before independence, financial operators in Nigeria were mainly foreign-owned commercial banks that provided short-term commercial trade credits for the operations of the multinational organizations that had their outlets in Nigeria (Nwankwo, 1991).

The Nigerian government, in a bid to accelerate economic growth, embarked on the development of the Nigeria Capital market which was meant to provide local opportunities for borrowing and lending of long-term

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capital by the public and private sectors, not excluding foreign-based organizations that offer their shares to the local investors and provide avenues for the multinationals to invest their surplus funds (Bassey, Ewah and Essang, 2009).Based on the report of the Babcock Committee, the Nigerian government set up the Lagos Stock Exchange in 1959, and it was backed by the subsequent enactment of the Lagos Stock Exchange Act of 1961. It commenced business in June 1961 and resumed the expected activities of the stock market as it provides necessary facilities for the public to trade in shares and stocks, while it maintain fair prices for all participants through stock-jobbing and other related activities, and such was restricted strictly to its members (Nemedia, 1982).

In 1977, the Lagos Stock Exchange was renamed the Nigerian Stock Exchange charged with the objectives of providing facilities to the Nigerian public for the purchase and sale of funds, stocks, and shares of any kind and for an investment of money, among others. According to the Memorandum and Articles of Association, the Exchange was incorporated as a private non-profit organization limited by guarantee to undertake the functions of providing trading facilities for dealing in securities listed on it, among others. Initially, the Nigeria Stock Exchange began trading activities with the floating of two development stocks, one preference share and three domestic equities offered by the federal government. The market witnessed slow growth during this period as only six equity stocks were traded at the end of 1966. This was an improvement when compared with only three sold at the end of trade in 1961. The bulk of the listening in the market were mainly government securities as about nineteen was quoted in 1966, compared with only six traded in 1961.

Before 1972, when the indigenization policy took off, activities on the Nigerian Stock Exchange were at its lowest level, and this was witnessed in the volume of transactions and value of trade. For instance, the levels of activities grew from ₦1.49 million in 1961 to ₦16.6 million in 1971. Similarly, transactions grew from 33 to 634 over the same period. Although the bulk of trading activities were in the government securities, which were mainly development loan stock through which the government raised money for the execution of its development plans (NSE Fact Book, 2002).In this regard, the Nigerian Enterprises Promotion Decree of 1972 was promulgated and implemented with a principal objective of promoting capital formation, savings and investment in the industrial, commercial and other related activities of the country. The low level of transactions in the stock market maintained an upward trend as Nigerians gained the commanding heights and active participation in the economy.

On the other hand, following criticisms that the Nigerian Stock Exchange was not responsive to the needs of local investors, especially indigenous participants who wished to raise capital for their businesses, the NSE, introduced the Second-tier Securities Market (SSM) in 1985 to provide the framework for the listing of small and medium-sized Nigerian companies on the exchange. Six companies were on the list of the segment of the stock market by 1988, and by 2002, more than twenty-three companies indicated interest and were subsequently listed in the market (Odoko, 2004). A fundamental question concerning stock markets is their efficiencies; the three forms of market efficiency described in the financial markets are; allocative, operations, and information efficiencies. However, Mushinov (2004), noted that a stock market with higher informational efficiency is more likely to retain operational and allocation efficiencies.

A market is regarded as being efficient with regards to a set of information if it becomes impossible to make economic profits by trading based on this information set. The term efficiency refers to broad availability of information on past stock prices to the general public and in turn, stock, how price movements respond to the information in a timely and accurate manner. Capital market efficiency therefore, suggests that stock prices incorporate all relevant information on past stock prices when that information is readily available and widely disseminated such that there is no systematic way to exploit trading opportunities and acquire excess profit. In other words, no arbitrage opportunities can be tapped using ex-ante information as all the available information has been discounted in the current prices (Magnus, 2008).

b) Motivation

The Capital market is a market that provides efficiency in capital formation and allocation, is expected to accelerate economic growth and development. Hence, for the capital market to have an impact on the development of the economy, it must operate efficiently. This, no doubt, generates confidence in the minds of the public and investors who are ready to trade with their hard-earned money and invest them in securities with the hope that in future, they would recoup their investment (Ewah, *et al,* 2009). If the market shows much volatile and speculative tendencies, investors will be unwilling to participate actively for the fear of overwhelming financial loses. The detrimental effect on the economy is that investors will refuse to invest in financial assets; hence, companies cannot raise additional capital for expansion. This will invariably hinder savings, and when savings are low, it will result in poor investment, and by way of cyclical effects, the unemployment rate would be on the increase vis-a-vis the poverty level.

Suffice it to say that he capital market since its inception on 15th September 1960 has had its shares of ups and downs. Empirical evidence from Olowe and Oludoni (2002) indicate that the capital market is

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imperfect as distortions noted in the market ranged from barring foreign investors from entering the market, regulating interest rate, imposing price caps on share price movements, political instability. All these resulted in general low performance of the capital market such that the repercussion effect is low market capitalization, low turnover, thinness in trading, significant abnormal returns, and illiquidity of the market.

Adelegan and Ariyo (2008) noted that information is not instantaneously and simultaneously available to all investors; hence, the existence of unequal access of firms to the capital market in Nigeria. Onwumere (2007) observed that limited instruments such as equity and bonds were traded in the Nigerian capital market due to the underdeveloped nature of the market. Okpara (2010) noted that ignorance on the part of most Nigerians coupled with low income and high marginal propensity to consume account for their strong desires to hold cash balances for transactions and precautionary rather than speculative motives. Such activities seem not only distorts interactions between information and prices of stock but also limited the mobilization of funds for development purposes and thus affects the liquidity of the capital market.

These anomalies, imperfections, and distortions inferred from the above assertions cast doubt on whether the trend in the Nigerian stock market can predict the economy and possibly lead to a reduction in unemployment and poverty level in Nigeria. However, some policy measures have been put in place over the years to checkmate these distortions in the capital market. For instance, the introduction of the Structural Adjustment Programme (SAP) in 1986 gave birth to the deregulation policy in 1987. This policy was meant to eliminate stringent laws and policies. It is worthy of note that SAP resulted in a positive response from the capital market as there was a tremendous boom. The boom led to a mad rush by most Nigerians investing in the capital market. Suffice it to say that the national income heightened as the GDP growth rate increased from 5.2% in 1986 to 23.22% in 1987. Though this did not have a commensurate impact on the development of the economy as our indices of study, the unemployment rate increased to 7.0% for 5.3% in 1986, and the poverty rate equally increased to 47.3% from 46.3% in 1986 (CBN, 2016).

Meanwhile, it was as a result of the deregulation exercise that the government sold its shares in many firms while privatizing and commercializing many of its parastatals in 1988. This increased private investment, and the GDP growth rate responded with an increment from 23.22% to 28.42% in 1988. Suffice it to say that the growth in the national income succeeded in reducing the unemployment rate still to 5.1% from 7.0% in 1986 while the poverty rate only increased by 1%.More so, the recapitalization exercise of banking and insurance industries in 2004 increased the number of securities in the stock market and at the same time, created a satisfactory public awareness and confidence in the stock market. This exercise, no doubt, increased market capitalization, which resulted in an enormous increase in the GDP growth rate to 30.22% from 17.38% in 2003. Suffice it to say that there was an insignificant impact of this growth on unemployment and poverty rates, as the former reduced by only 3% while the latter recorded a 0.2% reduction (CBN,2016).

Thus, the point of departure of this study is to relate the capital market to economic development, knowing that as national income increases, the expectation is that development indices such as unemployment and poverty levels reduce drastically. It is, in the light of this assert that the researchers are spurred into action, to fill this yawning research gap through variance decomposition and impulse response techniques which most researchers have not used in their capital market analysis. We therefore, ask the following research questions.

1. To what extent does market capitalization, all share index, and value of shares traded influence the poverty index in Nigeria?
2. Do market capitalization, all share index, and value of shares traded have an impact on the rate of unemployment in Nigeria?
3. What is the direction of the causal relationship between stock market indicators and economic development in Nigeria?

The current work will be guided by the following objectives; to x-ray the underlisted and consequently give empirical evidence on the following research hypotheses; viz: determine whether market capitalization, all share index and value of shares traded impact on unemployment level in Nigeria, ascertain if the capital market, all share index and value of shares traded influence the poverty level in Nigeria, and access the direction of causal relationship between the capital market and economic development indices in Nigeria.

Hypotheses:

H_{01}: There is no significant relationship between the capital market indices and the rate of unemployment.
H_{02}: Poverty index is not related to the capitals market
H_{03}: There is no causal relationship between the capital market and economic development.

II. Review of Related Literature

a) Theoretical Literature

i. Random-Walk Hypothesis

The theory behind the capital market efficiency and Economic development was made popular by a French mathematician and stock analyst Bachelier (1900). He convincingly stated that commodity speculation in France was a “fair game” where neither the buyers nor the sellers could expect to make a profit,

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hence past returns were independent of present or future returns.

Samuelson and Costner (1964) modified his work and likened it to a proverbial drunkard who, in his inebriated state, takes a step forward and a step backward. They opined that Random Walk Principles suggests that stock prices change randomly and this made prediction impossible.

Fama (1965) reviewed and presented the assertion formerly by categorizing the principles of efficient market hypothesis with some underlying assumptions.

ii. *Efficient Market Hypotheses*

The efficient market hypothesis implies that price adjustments are independent and random. Hence, a securities price at any point in time is an unbraided estimate of the real intrinsic value of the security at then. The three major forms of market efficiencies are:

(a) *Weak-Form Efficiency*

Okpara (2011) maintains that a market is efficient in the weak form when current security prices reflect all relevant information contained in its record. The fact that the value of a stock has risen for the past two or three days will give no useful information as to what today or tomorrow's price will be.

(b) *Semi-Strong Form Efficiency*

Semi-strong contends that the worth of any security reflects the only the past price of the stock but also all available public information (Information about the economy, political issues, news, company's financial statements). It reflects all publicly known information but does not consider private information or insider dealings.

(c) *Strong Form Efficiency*

This assertion contends that current market price instantaneously and fully reflects all pertinent information, including everything that is known and knowable, whether public or private. The theory encompasses both the weak and the strong forms of efficiencies.

b) Empirical Literature

The link between capital market efficiency and the development of the emerging economies has attracted empirical investigations by many researchers both Nigeria and other countries.

Ewah*et al.* (2009) evaluated the effects of the capital market efficiency on the growth of the Nigerian economy using a time series data from 1961-2004 analyzed with multiple regression and OLS technique and found out that the Nigerian capital market has the potential of growth-inducing but a minimal influence on the economic growth.

Adan and Sanni (2005) examined the role of the stock market on the Nigerian economic growth using granger causality and regression analysis and discovered one-way casualty between GDP growth and market capitalization and a two-way causality between GDP growth and market turnover ratio.

Osinobi and Amaghi (2003) examined the relationship between the Nigeria stock market and economic growth using data spanning 1980 to 2000. Applying the OLS method, found out a positive link between the stock market and economic growth.

Kehinde et al (2013) analyzed the impact of the capital market on economic growth in Nigeria using annual data between 1981 to 2010 and applying OLS and Vector Auto-regressive techniques found out that there exists a positive and long-run relationship between the capital market indicators used and the Real Gross Domestic Product.

Emenuga (1998) examined and analyzed the Nigerian stock market on the growth of the economy using a time series data from 1980 to 1995, applying unit root test and autocorrelation found out that the Nigerian capital market is illiquid.

Akingugbe (2005) analyzed the weak form efficiency of the Botswana stock market with data from 1990 to 2002, applying autocorrelation and augmented Dickey-Fuller test found out that there is evidence of weak and semi-strong form efficiencies.

Okpara (2011) analyzed the efficiency and predictive power of the Nigerian stock exchange with data from 1984 to 2009 applying the GARCH model and found out that there is evidence that the stock market in Nigeria is efficient and it equally follows a random walk.

Nwaolisa, Kasie, and Egbunike (2013) examined the impact of the capital market on the growth of the Nigerian economy under the Democratic Rule. Applying the multivariate regression method observed that MCAP and ASI positively influence GDP while VST has a negative effect.

Chinweuba and Amos (2011) examined the impact of the Nigerian Capital Market performance on economic development using the OLS model and observed that capital market impacts positively on the economic growth of Nigeria.

Smith and Ryoo (2003) examined stock market efficiency in the emerging markets in Greece, applying the Variance Ratio test found out that there is no evidence of efficient market hypothesis.

Ariyo and Adelegan (2005) are of the opinion that the liberalization of the financial market contributes to the growth of the Nigerian capital market, but then, its impact on the economy is insignificant.

Appiah (2003) employed the E-GARCH model and a logistic map to test the efficiency of the African Stock market; results particularly recognized the Nigerian stock market as not weak-form efficient.

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III. Methodology

The study adopts the Random walk theory propounded by Samuelson (1964) and reviewed by Fama (1970) Efficient Market Hypothesis (EMH). The theory emphasized that the stock market leads economic activities, and it ensures the availability of current information and the existing prices of stocks. The operational methodology adopted is the Unit Root test, co-integration tests, Vector Error Correction Model, Variance Decomposition, Impulse Response, Stability and Autocorrelation test. The scores of tests are to avoid spurious result which could lead to a wrong conclusion. A time-series of data from 1985 to 2017 was obtained from the CBN Statistical Bulletin.

a) Model Specification

For the capital market to contribute to the development of the economy, it must operate efficiently. Most often, where the capital market operates efficiently, confidence would be generated in the minds of the public and investors would be willing to part with their hard-earned fund which they will invest with the expectations of future returns. The increase in investors' confidence would motivate them to re-invest in securities, which invariably maximizes shareholders' wealth and cause a reduction in poverty level. Secondly, the capital in its numerous roles enables companies to raise extra finance that is essential for expansion. Thus, this expansion of industrial activities increases the marginal product of labor which would cause employment rate to equally be on the increase and invariably reduce the unemployment rate. By way of cyclical effect, more people would be gainfully employed and then move out of the poverty level. Hence, the functional forms of our econometric model is as follows:

Model One

$Y = F(X_1\ X_2\ X_3)$------equation(1)

Where Y is the economic development index and is the dependent variable X_1 to X_3 represents capital market indices and are the independent variable. F represents the functional notation specifically stated;

NPI = F(MCAP, ASI, VST)-------equation (2)

$Y = \alpha_0 + \alpha_1X_1 + \alpha_2X_2 + \alpha_3X_3 + u$--------(3)

$NPI = \alpha_0 + \alpha_1$ MCAPR $+ \alpha_2$ ASI $+ \alpha_3$VST + u------(4)

Where

NPI = National Poverty Index
MCAPR = Market Capitalization Ratio
ASI = All Share Index
VST = Value of Shares Traded
α_0 = Constant term
U = Stochastic Variable

Transforming equations 4 to the national logarithm

PI = $\alpha 0 + \alpha 1$ log MCAPR $+ \alpha 2$ logASI $+ \alpha 3$ logVST + u...(5)

Model Two

UNPR = F(MCAPR, ASI, VST)-----equation (1)

$Y = \alpha_0 + \alpha_1X_1 + \alpha_2X_2 + \alpha_3X_3 + u$……(2)

UNPR = $\alpha_0 + \alpha_1$ MCAPR $+ \alpha_2$ ASI + α_3VST + u…(3)

Where

UNPR = Unemployment Rate
MCAPR = Market Capitalization Ratio
ASI = All Shares Index
VST = Value of Shares Traded
A_0 = Constant term
U = Stochastic Variable

Transforming equations 3 to the natural logarithm.

UNPR = $\alpha_0 + \alpha_1$ Log MCAPR + α_2 Log ASI + α_3 log VST + u

To give clearer explanations the understanding and the interactions that exists between the variable, the VECM variance decomposition was adopted in both models. The VAR and VECM were developed by Sims in 1980, and it considers all the variables in the system as endogenous. The variance decomposition was introduced to trace the relative contributions of each variable in explaining the variability that occurs in each of the endogenous factors.

IV. Method of Data Analysis

In line with the aforementioned operational methodology proposed in the previous chapter, the time series data used for empirical probation were first

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subjected to stationarity tests to ensure that the results after that are appropriate for policy moderations. Subsequent upon that, the series was checked for cointegration test in order to ascertain a possible long-run trend among them.

The outcome of the above-mentioned preliminary analysis informed the choice of adoption of the Vector Error Correction Model (VECM) and by extension, the Variance Decomposition and Impulse Response Function, which shows the extent (percentage to which the variations in the dependent variable was brought about by the independent variables. As a follow up to the Variance Decomposition test, the VEC Granger Causality/Block Exogeneity Wald test was applied to check the cause and effect dynamics of the series.

a) The Stationarity/Unit Root Test Results

Table 1: ADF Unit Root Test

Variable	Deterministic trend	Lag	t-statistic	Critical Value 5%	Remarks
NPI	C	1	-6.252223	-2.945842	Stationary
UNPR	C	1	-5797366	-2.945842	Stationary
LoG MCAP	C	1	-4.574041	-2.945842	Stationary
LoG ASI	C	1	-4.128281	-2.957110	Stationary
LoG VST	C	1	-5.358556	-2.945842	Stationary

Table 2: Kwiatkowski – Philips – Schmidt – Shin (KPSS) Unit Root Test

Variable	Deterministic trend	Lag	t-statistic	Critical Value 5%	Remarks
NPI	C	1	0.163538	0.463000	Stationary
UNPR	C	1	0.179573	0.463000	Stationary
Log MCAP	C	1	0.174069	0.463000	Stationary
Log ASI	C	1	0.415168	0.463000	Stationary
Log VST	C	1	0.172026	0.463000	Stationary

A look at the results in tables one and two (1and2) above shows that the series were non stationary in their level forms, but after differencing once, stationarity achieved, thereby they are all integrated of order-one I(1), and this being the case, we proceeded to test the possibility of the existence of a long-run relationship among the variables.

Having ascertained stationarity, we applied the Johansen method of cointegration test as such is amenable to time-series data that exhibited such characteristics.

b) The Longrun/Cointegration Test

Table 3A: The Johansen Cointegration Test (model) (1)

Cointegration Test: Unrestricted Cointegration Rank Tests: Trace-Test & Maximum Eigenvalue
Series: UNPR LOG (MCAP) LOG (VST) LOG (ASI)

Hypothesized No. of CE(s)	Eigen values	Trace Statistic	5% Crit.	Prob.	Max-Eigen Statistic	5% Crit.	Prob.
None*	0.530216	45.84602	40.17493	0.0121	24.17545	24.15921	0.0498
At most 1	0.335945	21.67057	24.27596	0.1029	13.10051	17.79730	0.2214
At most 2	0.171798	8.570064	12.32090	0.1958	6.031960	11.22480	0.3461
At most 3	0.076252	2.538104	4.129906	0.1313	2.538104	4.129906	0.1313

* denotes rejection of null hypotheses of no cointegration at a 5% significance level.

Table 3b: The Johansen Cointegration Test (model 2)

Cointegration Test: Unrestricted Cointegration Rank Tests: Trace-Test & Maximum Eigenvalue
Series: NPI LOG (MCAP) LOG(VST) LOG(ASI)

Hypothesized No. of CE(s)	Eigen values	Trace Statistic	5% Crit.	Prob.	Max-Eigen Statistic	5% Crit.	Prob.
None*	0.600888	48.41207	47.85613	0.0443	29.39245	27.58434	0.0290
At most 1	0.250908	19.01963	29.79707	0.4915	9.244580	21.13162	0.8122
At most 2	0.191987	9.775048	15.49471	0.2984	6.821673	14.26460	0.5104
At most 3	0.088162	2.953375	3.841466	0.0857	2.953375	3.841466	0.0857

* denotes rejection of null hypotheses of no cointegration at a 5% significance level.

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The empirical evidence emanating from Johansen Cointegration tests in tables 3a and 3b for models one and two respectively reveal that the data series share a common trend among them in the long run. That is, the variables in both models are cointegrated. More technically, both the trace test statistic and the maximum-eigen value tests show the prevalence of one cointegrating vector among the series in the two models as adopted and based on the 0.05(5%) level of significance critical value.

c) The VECM and Variance Decomposition Results

The results of the long-run test above indicate that our data series are cointegrated. The prevalence of such conditions informed our choice for the adoption of the Vector Error Correction Model and by extension, the Variance Decomposition Analysis and Impulse Response Function to check the predictive power of the capital market variance on some chosen developmental variables in Nigeria.

Lag Order Selection Criteria

Before delving into further analysis, the models were subjected to lag order selection with different information criteria. The Final Prediction Error (EPE), Schwarz information (SC), the Hannan-Quinn Information (HQ) lag order selection criteria indicate the most preferred lag length of 1. The Akaike information indicates a lag length of 4.

Table 4: Optimal Lag Test Output

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-198.8314	NA	8.764305	13.52210	13.70892	13.58186
1	-53.14713	242.8072*	0.001561*	4.876475	5.810607*	5.175312*
2	-43.57092	13.40668	0.002553	5.304728	6.986165	5.842634
3	-31.23307	13.98290	0.003859	5.548872	7.977614	6.325847
4	-2.352440	25.02988	0.002349	4.690163*	7.866210	5.706208

* indicates lag order selected by the criterion

Based on the fact that out of four options adopted, three out of it chose lag length order of 1 while only one indicates four as the appropriate lag length, we, therefore, accept the lag length of one as the most preferred. The chosen lag length and its outcomes applies to models one and two as their various information criteria chose lag order one as the appropriate lag length.

Model two

The Variance Decomposition and IRF of model 2:

Table 5: Variance Decomposition and Impulse Responses of National Poverty Index (NPI) to Capital Market Variables

Variance Decomposition of NPI:					
Period	S.E.	NPI	LOG(MCAP)	LOG(VST)	LOG(ASI)
1	3.205698	100.0000	0.000000	0.000000	0.000000
2	4.368898	96.58939	1.324529	1.493477	0.592599
3	5.294328	93.26117	1.898704	2.760425	2.079697
4	6.050832	90.37080	2.484654	3.665481	3.479066
5	6.714574	87.99038	3.046748	4.343920	4.618955

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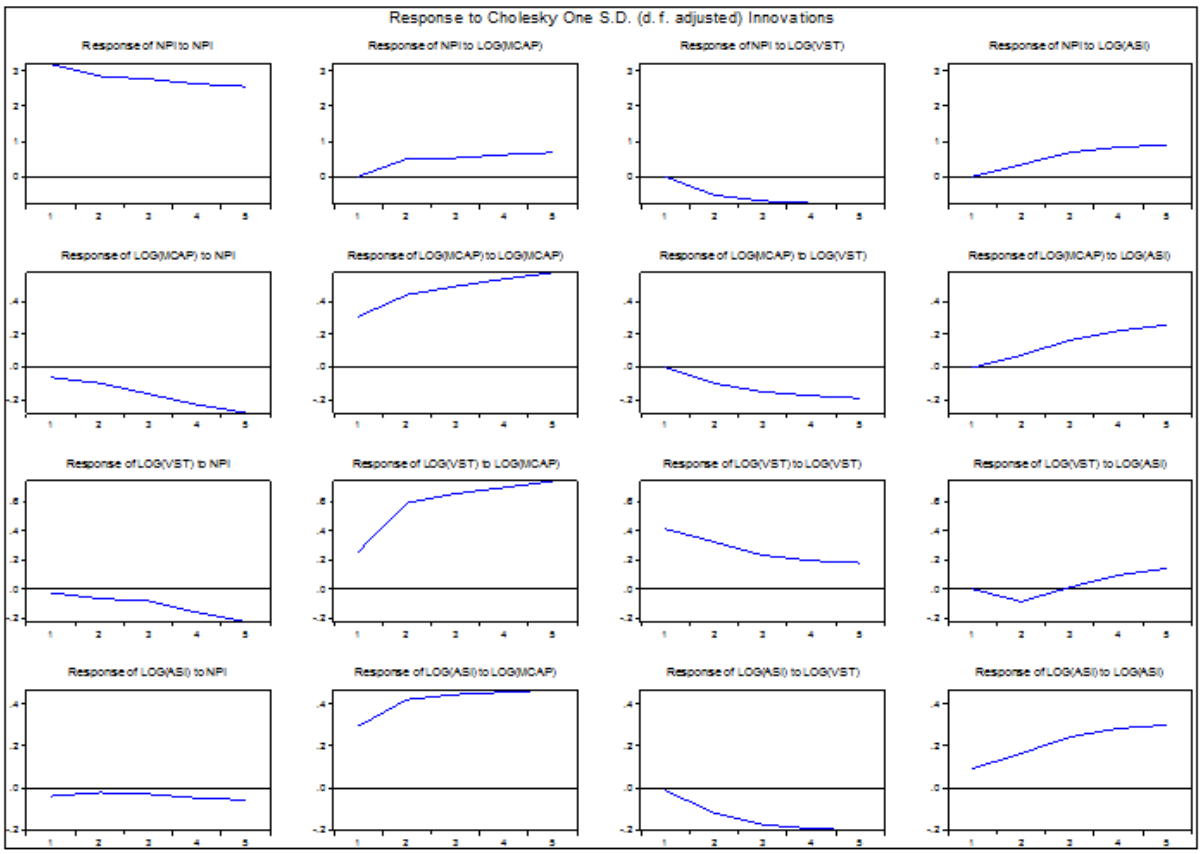


Fig. 1: Impulse Response Function of NPI and Capital market instruments

The variance decomposition of NPI presented in table 5 above reveals that 100 percent NPI variance can be explained by itself in the first period and continued in that same direction till the tenth period with a marginal difference as it stood at 94%. The capital market instruments collectively do not explain any variation of the NPI in the first period, however, they generally determined only 5.2% of changes in the NPI. These demonstrate that the contributions of the capital market to poverty reduction in Nigeria are highly insignificant.

To give further explanations, the variance decomposition and the Impulse Response Function (IRF) were employed. Figure 1 above depicts the outcomes of the IRF of NPI and capital market variables. The IRF demonstrates and further proof that the response of NPI to the capital market in Nigeria is highly insignificant, and this gives further justification to the VD results. The reaction of NPI to MCAP is positive from the first period till the third period. However, it turns negative from the fourth period till the tenth period. The response of NPI to both VST and ASI remained negative from the first period to the tenth period.

The results from the Variance Decomposition and the IRF clearly demonstrate that the contributions of the capital market in Nigeria to poverty reduction is highly insignificant, thus funds are in tandem with the revelations of Ewah, Bassey and Esang (2009), Emenuga (1998), Nwaolisa (2013), Ariyo and Adelegan (2015), Appiah (2003). Conversely, the revelations contradict the works of Chinweuba and Amos (2011), Kehinde (2013).

Model two

The Variance Decomposition and IRF of model 2:

Table 6: Variance Decomposition and Impulse Responses of Unemployment Rate (UNPR) to Capital Market Variables

Variance Decomposition of UNPR:					
Period	S.E.	UNPR	LOG(MCAP)	LOG(VST)	LOG(ASI)
1	2.520397	100.0000	0.000000	0.000000	0.000000
2	3.705849	80.10207	18.03889	0.956085	0.902951
3	4.439571	71.61123	20.78746	5.409825	2.191487
4	4.871430	70.98496	17.96159	7.630176	3.423280
5	5.159814	71.04959	16.08924	8.464362	4.396807

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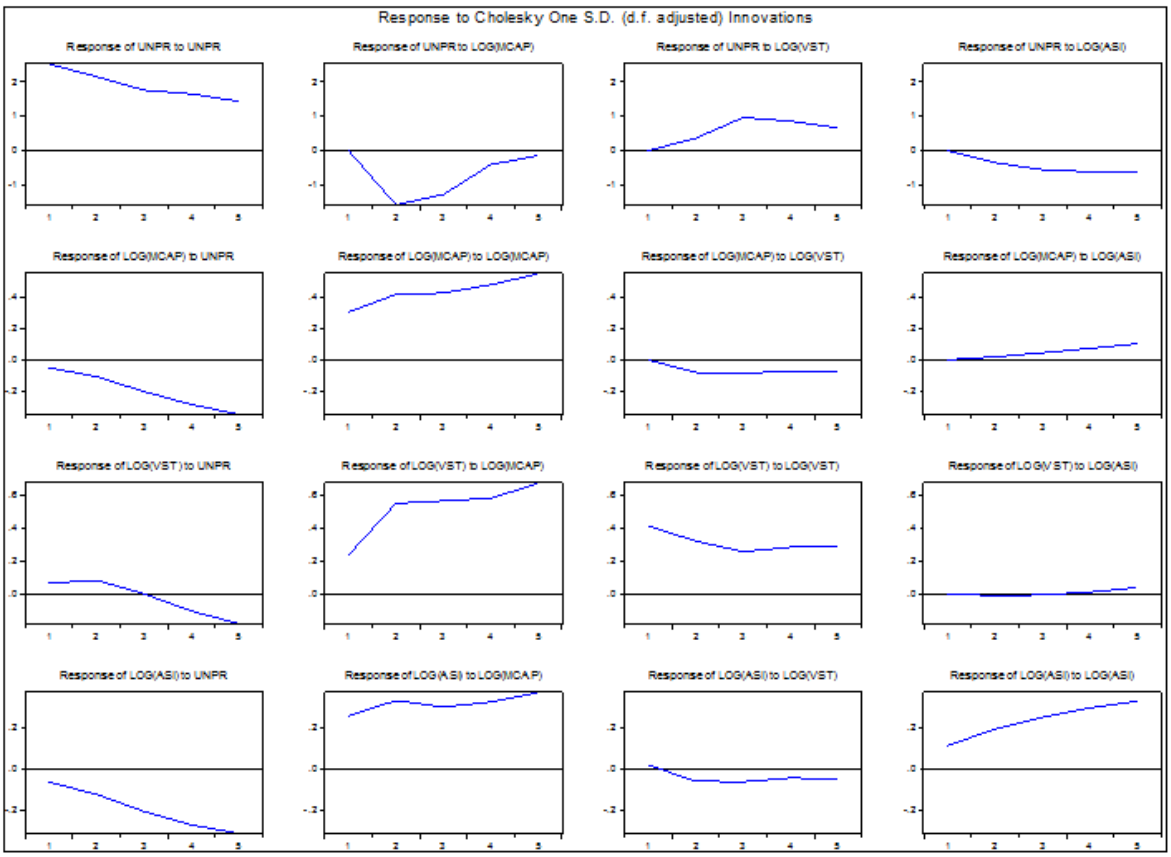


Fig. 2: Impulse Responses Function (IRF) of unemployment rates to the capital market in Nigeria

The variance decomposition of UNPR, as presented in the table above, reveals that 100% of the variations in the unemployment rate were explained by itself in the first period. The changes in UNPR that were brought by itself reduce gradually as it reduces to 43% in the tenth period. The capital market factors contributed 8% to the variance of the unemployment rate in the first period; however, with time, they collectively contributed 56.04% to the variance of the unemployment rate.

Individually, the value of shares traded (VST) has the highest contribution (31.98%) to the variance of unemployment while the value of shares traded (VST) and All Share Index (ASI) contributed 20.41% and 3.65% respectively to the changes of the unemployment rate at the tenth period. In the tenth period, the capital market variable contributed significantly to the variations of the unemployment rate in Nigeria; that is, they contribute about 56.04% to the reduction of unemployment rate in Nigeria within the period under review.

The Impulse Response Function of the unemployment rate and Capital Market Variables presented in figure 2 above to give further explanation to the result obtained from the variance decomposition. The response of UNPR to MCAP is negative in the first and second period; afterward, it turns positive from the third period till the last period of analysis (tenth period). The response of UNPR to VST and ASI is positive from the first period to the tenth period. Its response to VST attained its highest point in the third period, then a slight reduction in period four, and it remained stable within that range till the tenth period. The Capital Market Variables contributions to the unemployment rate in Nigeria are more significant compared to poverty reductions, as this is demonstrated in the results emanating from both the variance decomposition and the Impulse Response function. The findings correspond with the works of Adam and Sanni (2005), Osinubi and Amaghi (2003), Okpara (2011).

d) Diagnostic/VAR Stability Tests Model One/Two

The diagnostic test and VAR stability tests were carried out to ensure that the model is a stable one and devoid of Serial Correlation as the availability of such would render the results of the Variance Decomposition and the Impulse Response Function invalid and inappropriate for policy moderations. Secondly, the autocorrelation diagnosis would reveal the efficiency or inefficiency nature of the capital market.

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Table 7: The VEC Residual Portmanteau Test for Autocorrelations and VEC Residual Serial Correlation LM Test

Lag	LRE stat	Df	Prob	Rao F-stat	Df	Prob
1	7.926	16	0.9510	0.471652	16,617	0.9517

Lag	Q-stat	Prob*	Adj Qstat	Prob*	Df
1	3.314637	-	3.421560	-	-
2	17.54540	0.9370	18.60104	0.9100	28

The results in table 7 above obtained from the VEC Residual Serial Correlation LM test and that of the VEC Residual Portmanteau autocorrelation test nullifies the null hypothesis and prove that the residuals are not serially correlated, that is there is no autocorrelation, or there is absence of serial correlation in the models. However, in an efficient market, the null hypothesis of zero autocorrelation prevails. Therefore, the evidence above shows that the Nigerian Capital Market is weak-form efficient and follows a random walk.

VAR Stability Test

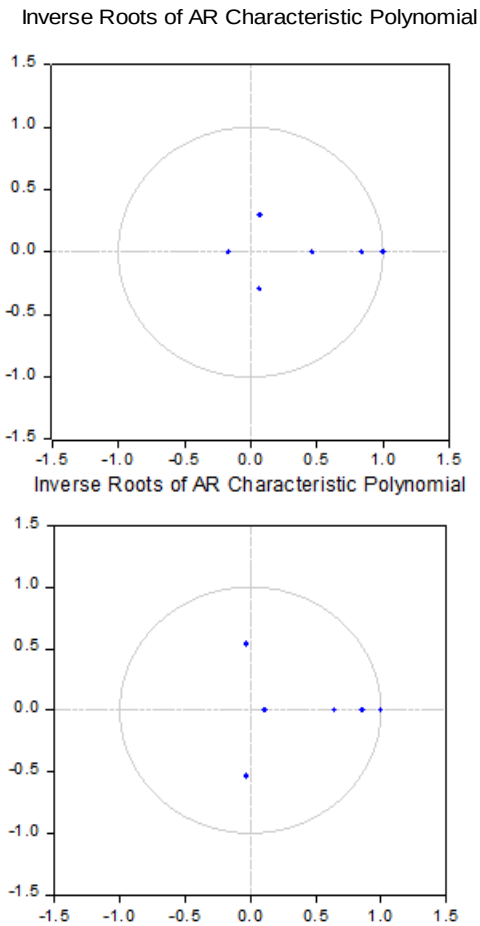


Fig. 5: Inverse Roots of AR characteristics Polynomial for models One and Two

To check for stability of the model, we applied the VAR inverse roots AR characteristic polynomial. According to Gujarati (2003), the VAR model is stable when all the modulus of its roots are less than one. In line with the VAR system tested for the two models, we can conclude that the VEC estimation for the VD and IRF analysis is stable on its optimal lag length.

V. Conclusion and Policy Recommendations

The study examined the transmission of capital market efficiency on the development of the Nigeria economy. The capital market was proxied by market capitalization ratio, All-Share Index and Value of shares traded, while economic progress was proxied by the unemployment rate and poverty rate.

The ADF unit root was adopted to test the level of integration of the variables, and all the variables attained stationarity. The series was checked for cointegration, and long-run relationship obtained among the variables. The outcome of this relationship informed our decision to analyze the series with VECM and by extension, the Variance Decomposition and Impulse response models. As a follow up to the above test, we employed the VEC Granger Causality/Block Erogeneity Wald test in to confirm the cause and effects dynamics of the series.

The results emanating from the above reveal that the capital market variables' contributions to the unemployment rate in Nigeria are more significant compared to poverty reduction.

Recommendations

(i) The government should intensify efforts that are directed towards efficient capital market development as this would restore confidence in the minds of investors and invariably enhance mobilization of funds for long term investment firms. Definitely, this would go a long way in engendering employment through job creation.

(ii) In the quest to reduce poverty rate, the regulators of the capital market should embark on adequate sensitization to the general public by offering services that are affordable to low-income earners to boost entrepreneurship in small and medium scale.

(iii) The regulatory bodies should ensure that information is disseminated speedily and accurately with utmost transparency. This is achievable by making sure that firms listed on the stock exchange publish quarterly or even semi-annual reports in

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addition to the usual annual information with detailed explanations to prevent insider abuse and ensure efficiency in the market.

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