Stock Markets and Economic Growth: Does Volatility Matter?

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Abstract
This study provides an extension to the a-priori relationship between growth and market development by including market volatility and volatility uncertainty into the model. The extended model takes the form of ADRL framework and it is estimated over a period of 1985 to 2012 using time series data on GDP and market capitalization index which are sourced from the Nigerian Central Bank Statistical Bulletin. We particularly adopt the bound test or ADRL approach to co integration and find that there is the presence of long-run relationship between growth, market performance, market volatility and volatility uncertainty. Also, the results of VEC Granger Causality reveal that both market performance and market volatility lead economic growth in Nigeria and they provide positive impact on growth. However, volatility uncertainty decreases with a rise in growth rate.

Keywords: Bound, ADRL, VEC, Granger, Causality, Co integration, Growth Volatility, Stock market, Nigeria

Jel Code: C5; C8; E2; G1; G2

1.0 Introduction

The perspective of growth in Nigeria is regrettably over-centered on the acquisition of consumables, liabilities and non-interest earning household assets. Therefore, the proportion of aggregate income that would have been channeled into savings or capital accumulation had been drastically shrunk overtime. The consequence of this reaction is that the stock market is left with very little savings to mobilize and channel into productive investments. The consumption-prone spending culture of an average Nigerian and the wasteful habit of the governments do not only limit the volume of transactions in the market they also increase the incidence of incessant thin trading. All of these put together give rise to heteroscedastic volatility. However, the empirical investigation on the relationship between growth and stock market development can be traced to the works of (McKinnon, 1973) and (Shaw, 1973) who critically affirmed that financial sector liberalization induces veritable avenues for large capital accumulations that invariably boost economic growth. Greenwood and Smith (1997) stressed that the pooling of resources by the stock market to finance large investments increase the tempo of growth. Efficient mobilization of resources on a long-term horizon stimulates investment opportunities and spurs economic growth. Evidence has shown that the stock market is a catalyst for growth and efficiency of an economy through mobilization and allocation of scarce savings among competing ends (Alile, 1984).

In a recent time, Adampoulos (2010) examined the direction of causality between growth and stock market development in Zambia and concluded that there is the presence of unidirectional causality between the variables with the direction of flows trickling from stock market to development. On the contrary, the study of (Sililo, 2010) is consistent with the demand following hypothesis that growth Granger causes market development in Zambia. However, the findings of (Athanasios & Antonios, 2012) in Greece refute the position of (Sililo, 2010) and overwhelmingly support the Adampoulos' (2010) conclusion. Hence, there is a critical issue awaiting fresh contribution especially in emerging economies; can we refute the conclusion of Sililo or that of Adampoulos here in Nigeria? Thus, this critical question is of serious theoretical and empirical concern to us. We are also motivated by the possibility of investigating the missing gap as a result of the egregious shortcomings of these studies which fail to examine whether stock market volatility and volatility uncertainty could influence/cause growth. In essence, the objective of this study is to examine the relationships among economic growth, stock market performance, stock volatility and volatility uncertainty. This unequivocally extends the current issues on the relationship between growth and capital market developments. The rest of the paper is organized as follows: section 2 looks at the literature review while section three deals with data and methodology. In section four, the results and findings of our empirical work are presented and discussed and in section five we have conclusion and recommendations

2.0 Literature Review

Various empirical studies have been conducted on the relationship between stock market development and economic growth with different positions. In the early works of (McKinnon, 1973) and (Shaw, 1973) on financial repression which is often referred to as the “McKinnon-Shaw” hypothesis, the authors assert that the liberalization of the financial sector in the form of an appropriate rate of return on real cash balances catalyzes economic growth. The ultimate contention of this hypothesis is that savings are discouraged by a low or negative real interest rate. Consequent upon this is the lowering of the available funds for investors to loan and corresponding reduction of the rate of economic growth. Therefore the model of McKinnon and Shaw overstresses that a liberalized financial system with absence of financial repression propels savings and investments to higher magnitudes and consequently promotes economic growth. Pagano (1993) outlined three areas whereby financial sector development could influence growth based on endogenous growth model: one, it could increase investment outputs to a considerable height, two, it could minimize transaction costs and hence increase the proportion of savings canalized into productive investments and three, it could either promote or retard savings through concessionary rates or otherwise. However, various models emphasize that well-functioning financial markets reduce/completely eliminate information and transactions costs through efficient resource allocations and thereby enhancing economic growth on the long-run (Greenwood & Jovanovic, 1990; Bencivenga & Smith, 1991; Bencivenga, Smith & Starr, 1996; King & Levine, 1993). For example, Levine and Zervos (1996) investigated the causal relationship between stock market development and economic growth in the long-run based on pooled regression data of forty-one countries for a period 1976 to 1993. Their findings show a monotonic association between aggregate stock market development and economic growth on the long-run which alternatively means a positive relationship between stock market development and economic growth.

Filer, Hanousek and Campos (1999) examined the causality between stock market development and economic growth using Granger causality technique for 70 countries for a period of twelve years ranging from 1985 to 1997. They discover little relationship between stock market activity and long-run economic growth, especially for the lower income countries. In addition, Kassimatis and Spyrou (2001) appraised the relationship between stock-market, credit-market and economic growth in several emerging economies using causality method. They revealed that in repressed markets, the stock market has either an inverse impact or zero impact on economic growth. Argrawall and Tuteja (2007) also investigated the relationship between stock market performance and growth based on pooled data for nine African countries for the sample period 1992-1997. They particularly employed simple correlation between some stock market proxies and investment. Their findings reveal a positive relationship between several of the stock market performance indicators and economic growth. In his study, Seetanah (2009) explored the complex nexus between stock market development, bank development and economic growth for 27 emerging countries for a period 1991 to 2007. He adopted rigorous panel VAR procedures for his analysis and showed that stock market development is an indispensible factor of growth, but when compared to the other determinants of growth, especially banking development; it has a relative lower magnitude. Nowbutsing and Odit, (2009) studied the effect of stock market development on growth in Mauritius using time series data for the period 1989 -20067*. Analyzing both the short run and long run relationships; they conclude that stock market development has positive impact on Mauritius economic growth in both the short run and long run equilibrium position.

Olweny and Kimani (2011) investigated the link between economic growth and capital market development in Kenya for the period 2001-2010 using Granger causality and Johansen and Juselius co-integration techniques. The results of the later confirm a long-run relationship while the former imply that the causality between economic growth and stock market runs uni-directionally from the Nairobi Stock Exchang 20-Share index to GDP. They concluded that the “movement of Nairobi Stock Exchange reflects the macroeconomic condition of the country and can therefore be used to predict the future path of economic growth”. Adamopoulos (2010) carried an empirical investigation on the causal relationship between stock market development and economic growth in Germany using time-series data for 1965-2007 period. He applied Johansen co integration analysis based on the classical unit root tests and found that there is the presence of co integration between the variables. Furthermore, the results of the Granger causality tests reveal a unidirectional causality from stock market performance to growth. Udaya (2012) employed co integration and vector error correction mechanisms to examine the level of significance (if any) between stock market development and economic growth in Nepal for the period 1994-2011. Satisfying the objective of the unit root test, he found that the variables are co integration at order one. Antonios (2010) examined the relationship between financial development and economic growth for the period 1965-2007 in Ireland using Johansen multivariate co integration and Granger Causality mechanisms. The results show one co integrating vector which indicate that the specified variables maintain long-run relationship. Also, the Granger causality test result implies that economic growth causes credit market development while there is bidirectional causal relationship between growth and stock market. He therefore concluded that economic growth has positive influence on the development of both stock and credit markets.

In Nigeria, Mustapha and Yusuf (2013) demonstrated an empirical study on the relationship between Nigerian capital market and economic growth using time-series data that cover a period of 26 years ranging from 1986-2012. They applied co integration technique to examine if there is in existence any long run relationship between the variables and found that growth and capital market in Nigeria are co integrated in the long run. Furthermore, Ogbulu (2009) examined whether there is any long run relationship between capital market activities and economic growth in Nigeria as well as the direction of causality between some selected capital market indicators of performance and economic growth using the Engle-Granger and Johansen-Juselius techniques of co-integration. The author employed time series data for the period 1970-2008 and the empirical results demonstrate that there is a long run relationship between capital market indicators and economic growth in Nigeria. The Granger causality test results are however mixed showing that there is a uni-directional causality from GDP to Value of transactions and market capitalization respectively while the Granger causality relationship between GDP and Value of new issues is bi-directional. The results report no Granger causality relationship between GDP and Turnover ratio and Number of listed securities respectively.

In the same token, Ogege and Ezike (2012) applied Engle-Granger and Johansen methods of co integration and established a long-run relationship between growth and capital market development in Nigeria. The study by Odetayo and Sajuyigbe (2012) in Nigeria employed Ordinary Least Squares technique and reveals that stock market has significant impact on the growth of Nigerian economy. As varied as the results of these studies are, the overall shortcoming of these studies is that they fail to extend the frontiers of these studies on this subject matter to embrace stock volatility and volatility uncertainty in the finance-growth nexus. This is a very vital gap that ought to be addressed and which the current study intends to cover.

3.0 Methodology and Data

The first model that is considered in this study is the Autoregressive Conditional Heteroscedastic (ARCH) specification of (Talor, 1986). The ARCH (1) model in relation to stock market index can be expressed as:

$$Mind(t) = \lambda 0 + \lambda 1\ Mind(t-1) + et \quad \text{--(1)}$$
$$Et = wtSDmind(t),\ wt \tilde{}\ N(0,1) \quad \text{---(2)}$$
$$Volmind(t) = a0 + a1\ e2t-1 \quad \text{--(3)}$$

Where: $M_{ind(t)}$ represents the composite stock market index (All-Share index) of the Nigerian Stock Exchange at time (t)

e_t is the random error term

w_t is the white noise which is identically and independently distributed.

$SD_{mind(t)}$ is the standard deviation of the composite market index at time (t).

$Vol_{mind(t)}$ is the conditional variance of the composite stock market index at time (t) which is the volatility term.

Therefore, equation (3) is alternatively known as conditional variance equation while equation (1) is known as conditional mean equation.

e^2_{t-1} is the one-period lag term of the square of the random error and it represents the ARCH term.

*The composite stock market index CSMI can be defined as;

$$M_{ind(t)} = \frac{Tc_1 - Tc_0}{Tc_0} \times 100 \quad \text{---(4)}$$

Where: $M_{ind(t)}$ = CSMI

Tc_1 = total capitalization at current year

Tc_0 = total capitalization at base year

Tc_1 = sum of the outstanding share x price at current year

Tc_0 = sum of the outstanding share x price at base year

According to (Vazakidis, 2006; Shan, 2005 and Vazakidis & Adamopoulos, 2009), the composite stock market index is considered better than other financial indices as a proxy for stock market performance. In the absence of any other broad-based stock market index in the Nigerian capital market, we adopt the NSE All-Share Index which is all-inclusive of all equity stocks (but not all assets as in Ogbulu, 2012) quoted on the NSE and is also market-value weighted in its computation. Therefore, in order to test the causal relationship between growth, stock market performance, stock volatility and volatility uncertainty we adopt a model that is close to the multivariate specification of (Antonios, 2010). Thus, the origin of our estimated model can be stated linearly as:

$*Gr(t) = \beta_0 + \beta_1 Mind(t) + \beta_3 Volmind(t) + \beta_4 UVolmind(t) + \mu t$ -------------------------- (5)

Where: $UVolmind_{(t)}$ is the uncertainty of volatility which is a dummy variable that takes values (1) or (0). It is (1) when the volatility value is above average; otherwise zero when the value of volatility is less than average. Gr is the growth rate of GDP. Other variables had already been defined. The coefficients β_3 and β_4 are very paramount in this study. If they are significant, it implies that stock market volatility and its instability (uncertainty) have significant impact on economic growth, otherwise not.

The study further employs the autoregressive distributed lag (ARDL) model or bound test approach to co integration because the series of volatility data may be both I(0) and I(1) compliant in nature. Therefore, there is the tendency that the specified variables in equation (5) are integrated at different orders. The ARDL approach to co integration was originally developed by (Pesaran & Shin, 1999). This approach has advantage over the Johansen and Juseluis mechanism since it can be applied whether or not variables are I(0) or I(1). The ARDL representation of equation (5) can be explicitly expressed as:

$$\partial Gr(t) = \lambda 0 + \sum ni = 1\ \lambda 1 \partial Gr(t-1) + \sum ni = 0 \lambda 2iMind(t-i) + \sum ni = 0\ \lambda 3i \partial Volind(t-1) + \sum ni = 0\ \lambda 4i\ \partial UVolind(t-1) + \varepsilon t + \beta_1 Gr(t-1) + \beta_2 Mind(t-1) + \beta_3 Volindt-1 + \beta_4 UVolind(t-1) + \varepsilon t \text{---------------}(6)$$

$$i = (0, 1 \ldots n)$$

Where: ∂ stands for the 1^{st} difference operator.

λ_0 is the constant representing the drift component.

ε_t is the residual error term.

Note that the first set of variables in the right hand side of equation 6 that is the expressions with sigma signs ($\lambda_{1i} - \lambda_{4i}$) represent the short-run dynamics of the model while the expressions without the sigma signs ($\beta_1 - \beta_4$) correspond to the co integration relationship exhibiting the variables.

Thus, we adopt the bound test or ARDL technique under (Pesavan, Shin & Smith, 2001) procedure to estimate the presence of long-run relationship between/among the specified variables. The bound test technique involves computing the F-test or Wald-statistic of the ARDL specification and then subsequently comparing the F-value with the Pesaran's critical values at the lower and upper bounds. The lower critical value affirms all variable to be I(0) whereas the upper assumes variable to be I(1) in nature. The I(0) means that variables are not co integrated; while I(1) implies presence of co integration. If the calculated or observed F-statistic is equal to or below the lower bound critical value, it means that there is no co integration. Conversely, if the observed F-value is equal to or larger than the upper bound critical value, it means that the variables are co integrated, therefore leading to the rejection of the null hypothesis of no co integration. However, if the observed F-statistic falls within the range of values between the lower and upper critical values, it means the test is inconclusive.

To look at the speed of adjustment in the short-run disequilibrium, we develop a special version of ARDL error correction mechanism as follows:

$$\partial Gr(t) = \alpha 0 + \sum ni = 1\ \alpha i1\ \partial Gr(t-i) + \sum ni = 0\ \alpha 2i\ \ \partial Mind(t-i) + \sum ni = 0\ \alpha 3i\ \partial Volind(t-1) + \partial UVolind(t-1) + \lambda ECM + \mu it \text{--}(7)$$

Where: λ is the coefficient of the speed of adjustment while ECM is the residuals obtained from the co integrating expression of equation (6). The theoretical sign of lambda (λ) is negative and if not it is considered irrelevant since no adjustment can be made.

We explore Granger Causality framework to evaluate the directions of causality between these variables including stock volatility and volatility uncertainty. Granger (1969) posited that Y is said to Granger cause X, if the lag values of Y can be used to predict X better than the past values of X. This is analogously known as unidirectional or one-way causality with the flow from Y to X. On the other hand, there is existence of bi-directional or two-way causality which says Y and X Granger cause each other and we have the zero causality implying the absence of cause and effect in a relationship between Y and X. Therefore, Granger's definition of causality is essentially based on predictability. To implement the Granger's mechanism another version of ARDL framework with lag length (n) can be specified as:

Mind(t) = λ1 + ∑ni = 1a1iMind(t-1) + ∑nj = 1 b1iGr(t-j) + eit ---(8)
Gr(t) = λ2 + ∑ni = 1 a2iGr(t-i) + ∑nj = 1b2iMind(t-j) + e2t ---(9)
Again, the F-statistic value (F) is computed and compared with the critical F-value (F_*); if $F > F_*$, we reject the null hypothesis of no Granger causality.

3.1 Data

The time series data on economic growth (GDP) and stock market index are sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin. The data span through the period of 1985 to 2012 and are subsequently transformed to rates in order to maintain the same unit of value for our analysis.

4.0 Empirical Results

We compute the mean, standard deviation, skewness, kurtosis and Jarque Bera statistics of the data series over the period 1985 to 2012. The results are as presented in Table 4.1 which shows the descriptive statistics for the analysis.

Table 4.1: Descriptive Statistics for the Series of Growth, Market Performance, Market Volatility and Volatility Uncertainty for 1985 to 2012

Variable/Series	Mean	Std Dev	Skewness	Kurtosis	JB
Gr	0.06	0.05	1.14	4.69	9.43(0.01)
M_{ind}	0.14	0.23	-1.79	8.14	45.75(0.00)
Vol_{ind}	0.08	0.08	3.00	12.38	144.67(0.00)
$UVol_{ind}$	0.36	0.49	0.60	1.36	4.81(0.09)

Note*: The values in brackets are the probability values.*
Source: *Computed from e-Views Window 7*

Table 4.1 has evidently shown that the mean values of the variables are positive implying that they have increasing tendency throughout the study period. It is noted that volatility uncertainty has the highest mean value and standard deviation while growth rate displays the lowest mean value and standard deviation. We therefore posit that uncertainty of market volatility is more unpredictable than economic growth rate in Nigeria. We observe that all the series are positively skewed except the series of market index and again are all leptokurtic except the series of volatility uncertainty. However, the probability values of the Jarque Bera statistics indicate that all the series are not normally distributed except the series of volatility uncertainty. This makes us to proceed to the test of the presence of a unit root to further confirm the results of the JB Statistics.

Table 4.2: Unit Root Test Results

Variable/Series	PP_0	I(0)	PP_2	I(1)	ADF_0	I(0)	ADF_1	I(1)	$KPSS_0$	I(0)	$KPSS_1$	I(1)
Gr	-3.24	(-2.98)*	-6.95	(-2.98)*	-3.26	(-2.98) *	-6.99	(-2.98)*	0.25	(0.46)*	0.06	(0.46)*
M_{ind}	-4.08	(-2.98)*	-17.76	(-2.63)*	-4.11	(-2.97)*	-5.92	(-2.99)*	0.35	(0.46)*	0.29	(0.46)*
Vol_{ind}	-4.67	(-2.98)*	-13.39	(-2.98)*	-4.69	(-2.98)	- 5.03	(-3.00)*	0.16	(0.46)*	0.30	(0.46)*
$UVol_{ind}$	-4.04	(-2.98)*	-10.31	(-2.98)*	-4.06	(-2.98)*	-7.48	(-2.98)*	0.09	(0.46)*	0.03	(0.46)*

Note: *PP_0, ADF_o, & $KPSS_o$, means observed values of Phillip-Peron, Augmented-Dickey-Fuller and Kwiatkowski-Phillips-Schmidt-Shin Statistics at levels respectively; PP_1, ADF_1, and $KPSS_1$, are the observed values for the respective statistics at first difference; while 1(0) & 1(1) are the respective critical values @ levels and first difference. * implies significance at 5%.*
Source: *Computed from E-Views 7.*

The results of the unit root test in respect of the PP, ADF and KPSS statistics are presented in Table 4.2. The observed PP and ADF statistics are larger than the critical values at both levels and first difference for all the variables making us to reject the null hypothesis that the variables are not stationary. To corroborate these tests, we also employed the KPSS technique. Looking at the observed KPSS statistics for all the variables, we discover that they are larger than all the critical values at level and first difference data. Thus, the null hypothesis cannot be rejected, suggesting that the PP, ADF and KPSS techniques provide strong evidence that the variables are integrated at different orders. Therefore, Johansen multivariate co integration technique cannot be appropriate in this study. This makes us to proceed to the application of bound test or ADRL method to co integration. The ADRL technique assumes that there is only one co integrating vector or long-run relationship between the explained and explanatory variables (Pesaran, et al, 2001) and it is based on the F-statistics or Wald statistics.

Table 4.3: Results of Test for Co integration Based on ADRL Technique

Order of lag	F-stat	Pesaran stat @ 5%		Narayan stat @ 5%	
		lower bound	upper bound	lower bound	upper bound
1	3.53	3.23	4.35	2.96	3.91
2	1.74	3.23	4.35	2.96	3.91
3	4.65	3.23	4.35	2.96	3.91

Note: *the Pesaran and Narayan critical value bounds are extracted from Table CI (iii) with no trend and unrestricted intercept*
Source: *Computed from E-Views.7*

The results of co integration test in Table 4.3 show that the F-statistic at lag 2 falls below the lower bound level for both Pesaran and Narayan statistics at 5% level implying that the null hypothesis that the variables are not co integrated cannot be rejected. Also, at lag 1, the F-value falls in between the lower and upper bounds for both statistics. Therefore, there is inconclusive evidence to reject the null hypothesis. However, we noted that F-statistic at lag 3 is larger than the upper critical value for both statistics thereby rejecting the null hypothesis of no co integration.

The nature of the short-run and long-run relationship as well as the speed of adjustment are obtained from the estimated values of equation 7 and are as presented in Table 4.4.

Table 4.4: Results of the ADRL Estimation

Panel A: Short-Run Coefficient Estimates		
ECM	-0.36(0.12)[-3.06]**	
M_{ind}	0.41(0.17)[2.50]**	
Vol_{ind}	3.30(0.66)[4.97]**	
$UVol_{ind}$	-0.22(0.10)[-2.23]**	
Panel B: Long-Run Coefficient Estimations		
∂Gr	0.24(0.31)[0.79]	
∂M_{ind}	-0.02(0.06)[-0.32]	
∂Vol_{ind}	0.17(0.26)[0.65]	
$\partial UVol_{ind}$	-0.05(0.04)[-1.25]	
Panel C: Diagnostic Tests		
Serial Correlation		10.68(0.83)
Heteroskedasticity		155.79(0.90)
Normality		50.42(0.00) **

Note: *The figures in parenthesis and brackets are the standard errors and t-values respectively for panel A and B: while the figures in parenthesis in panel C are the probability values.** implies significant @ both 1% & 5%.*
Source: *Computed from E-Views 7*

With respect to panel (A) in Table 4.4, the observed t-values for market capitalization, volatility of market and uncertainty of volatility are 2.50, 4.97 and -2.23. Given a critical t-value 1.71 at 5%; it means that the variables are highly significant in influencing the growth rate of the Nigerian economy. However, the coefficient of volatility uncertainty is negative meaning that an increase in market volatility uncertainty decreases the rate of economic growth. The adjustment parameter (-0.36) is negative and highly significant. Therefore, the sign of the ECM is theoretically appropriate which means growth, market performance, market volatility and volatility uncertainty are co integrated. The absolute value of the ECM coefficient implies that about 36% of the disequilibrium in growth rate is offset by short-run adjustment annually. This means that a large growth rate is followed in the next period by a reduction in growth rate. Therefore, it is necessary to reduce the existing short-run disequilibrium so as to maintain long-run equilibrium.

The corresponding ADRL long-run model results depicted in Panel (B) of Table 4.4 shows that market volatility is positively related to growth while market performance and volatility uncertainty are negatively related to growth. This means that the position of the market performance in the short-run has been altered in the long-run equilibrium position which calls for adjustment. Panel C in Table 4.4 displays the results of the diagnostic tests for the ADRL model. The results show that the null hypothesis that the successive residual series are not auto-correlated and heteroscedastic cannot be rejected while the null hypothesis that the residuals are not normally distributed can be rejected. Thus, it means that the residuals are identically and independently distributed and the model is well fitted.

We employed the VEC Granger Causality and Block Exogeneity Wald Tests to examine the direction of causality between the specified variables. Our results are summarized in Table 4.5.

Table 4.5: Results of the VEC Granger Causality and Block Exogeneity Wald Tests

Variables:	D(Gr)	$D(M_{ind})$	$D(Vol_{ind})$	$D(UVol_{ind})$
D(Gr)	-	1.39(0.50)	2.43(0.30)	1.69(0.43)
$D(M_{ind})$	12.50(0.00)*	-	10.01(0.01)*	6.23(0.04)*
$D(Vol_{ind})$	10.32(0.01)*	0.70(0.71)	-	2.63(0.27)
$D(UVol_{ind})$	3.30(0.19)	1.81(0.40)	8.49(0.01)*	-

Note: *the figures without parenthesis are the Chi-squared or LM Statistics while those inside parenthesis are the p-values. The critical LM Statistic is given as 5.99 @ lag 2 with 5% significance level. * implies significant @ 5%.*

Source: *Computed from E-Views 7*

The results reported in Table 4.5 are derived from the computed values of equations 8 and 9. It is discovered from the block exogeneity wald test that market performance and market volatility are exogenously determined when GDP is retained as an endogenous variable. Market performance and volatility uncertainty are exogenous when market volatility is transformed to an endogenous variable, while only market performance appears to be exogenously determined when volatility uncertainty is transformed to endogenous variable. Therefore, it is apparent that only market performance is truly exogenously determined while only GDP is truly endogenous in the system. According to the results of VEC Granger Causality Test, it is estimated that market performance Granger causes growth rate (Gr), market volatility and volatility uncertainty. Also, it is discovered that market volatility only Granger causes growth, while volatility uncertainty granger causes market volatility. Thus, we can say that market performance and market volatility lead economic growth in Nigeria implying that growth can be predicted based on the changes in the performance of the stock market and its corresponding shocks/volatility.

5.0 Conclusion and Recommendations

As we have noted, our study is an extension of the existing studies because it has incorporated market volatility and volatility uncertainty into the a-priori or theoretical relationship between growth and capital market development. In consonance with the findings of (Greenwood & Smith, 1997) and also (Alile, 1984), we discover that there is the presence of monotonic relationship between growth and market performance. Furthermore, the VEC Granger Causality tests show that market development leads economic growth. This is contrary to the claims of the popularly known demand-following hypothesis. However, our position is strongly supported by the studies of (Adampoulos, 2010) in Zambia and (Athanasio & Antonios, 2012) in Greece.

Our additional findings reveal that market volatility does not only positively affect growth but it causes growth while volatility uncertainty decreases with a rise in growth rate. Thus, we recommend that authorities in the Nigerian capital market should spur more participants into the market through attractive investment policy measures with commensurate rates of return that are stable over the long term horizon. Furthermore, the public's inordinate affection for consumables should be checked through the imposition of an appropriate tax regime on consumables/non-interest yielding assets. This will probably redirect people's preference away from consumables and other non-interest yielding assets to the stock market to boost activities in the market.

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