IOSR Journal of Business and Management (IOSR-JBM)
e-ISSN: 2278-487X, p-ISSN: 2319-7668. Volume 24, Issue 5. Ser. V (May. 2022), PP 59-69
www.iosrjournals.org

Effect of Value Relevance of Accounting Information on Stock Market Volatility in Nigeria: Application of EGARCH model

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Abstract
The study investigated the effect of value relevance accounting information on stock market volatility in Nigeria *using panel data analysis with data covering from 2000 to 2016. The main objective was to verify the extent to which dividend per share, earnings per share, book value per share and market value per share have significantly influenced annual share prices in the Nigerian Stock Exchange (NSE). The study sampled a total of ten quoted firms, which included Mobil Oil Nigeria Plc, Oando Plc, First Bank of Nigeria Plc, GTBank Plc, AIICO Insurance Plc, Niger Insurance Company Plc, Cadbury Nigeria Plc, Flour Mills Nigeria Plc, BOC Gases Nigeria Plc and Nigerian Enamel Plc, and with LLC, ADF and PP panel unit root approach, the study found that all series investigated were integrated of order one (that is, I (1)). In the panel co integration analysis, the study documented that all series exhibited a stable long run relationship with annual share prices of the listed firms within the periods under review. The result of short run dynamics panel test showed that there is a well defined error correction term, which reflected a feedback of 98 percent of the previous year's disequilibrium from the long run accounting variables such as dividend per share, earnings per share, book value per share, market value per share and stock market volatility of the quoted firms. In modeling volatility using EGARCH (1, 1), the results showed that in dividend per share, firms such as OAUDO, FIRSTBK, AIICOINS, ENAMEL and BOC exerted negatively to stock market volatility while MOBIL, GTBank, NIGERINS, FLOUR and CADBURY showed positive in response to the volatility of stock markets. In earnings per share, OAUDO, MOBIL, NIGERINS and FLOUR exhibited positively while other firms were negatively related to stock market volatility. In book value per share, all the firms under review excepting NIGERINS and ENAMEL, which seemed to be positive were found to be negatively related to stock market volatility. In market value per share, Niger and AIICO insurance were negative while other companies were positively related to stock market volatility. These empirical evidences justified the application of EGARCH (1, 1), which examined both the symmetric and asymmetric effect of variables under investigation. Based on the above findings, the study is of the opinion that there should be cumulative retained earnings of accounting variables, sequential documentations and other entries under the equity of stockholders to ensure relevance in the value of investors' assets.*

Key Words: Value Relevance, Accounting Information, Stock Market Volatility, EGARCH and Nigeria.

Date of Submission: 18-05-2022 Date of Acceptance: 02-06-2022

I. Introduction

The link among accounting information, value relevance and stock volatility stimulates considerable interest across a diverse range of researchers and more importantly capital market investors, financial analysts, management and accounting professionals. A common factor among the three is stock price and stock price movements. Specifically, stock prices mirror value relevance and can sometimes be an important guage for stock volatility. In the capital market, two factors are important in share price determination; these factors are accounting and non-accounting information (Khanagha, 2011; Cheng, Shamsher and Annuar, 2008, cited in Ejuvbekpokpo and Edesiri, 2014). Accounting information refers to the means by which we measure and communicate economic events whether in the management of a business enterprise, making investments or in being observant in the receipt and disbursement of money (Bo, 2009). It originates in the form of ratios, which could be earning per share, dividend per share, book value per share, market value per share and amongst others.

Non-accounting information on the other hand refers to information other than accounting which can be speculations, gambling and rumours (Ejuvbekpokpo and Edesiri, 2014). Consistent with efficient market theory, stock prices are a reflection of both types of information; and as such they serve as the basis for the valuation of whether a business enterprise is performing well or not. These prices are relevant measurement of the returns accruing to the stakeholders, therefore the value attached to them serves as a major boost to both existing and prospective investors in the capital market (Glezakos, Mylonakis and Kafourous, 2012).

There are many claims that accounting theory and practice have not kept pace with stock market volatility which invariably affect the value relevance of accounting information (Akinde, 2015). In other words, past studies (e.g. Osondina, Jayeoba and Olayinka, 2016; Stephen and Okoro, 2014 and Abiodun, 2012) have documented that variability of stock prices affects the value relevance of accounting information. But the extent of this variability remains largely debatable. More so, the observation of investors and finance managers of the effect of accounting variables on stock prices has necessitated the idea of conducting this study. Accounting information variables such as dividend per share, earnings per share, book value per share and market value per share will assist investors to determine the expected returns on their investments. (Wan, 2010). Thus, the poor quality of accounting information and its relevance or irrelevance, the distorting effect of poor quality of accounting information on stock price movement, failed policies on this area and inconsistencies of empirical evidences documented constitute a serious dodge in investigating on this area. Based on these loopholes, the study is intended to fill the existing gap by investigating the effect of value relevance accounting information on stock market volatility in some quoted companies listed on the Nigerian Stock Exchange (NSE). The rest of the paper was structured as follows; section two presented the conceptual issues, theoretical and empirical review, section three dwelled on the method of study, section four presented and analyzed results while section five concluded.

Research Hypothesis

a. H_{01}: Reported dividend per share does not have a significant effect on stock market volatility in the Nigerian stock market.

b. H_{02}: Reported earnings per share do not have a significant effect on stock market volatility in the Nigerian stock market.

c. H_{03}: Reported book value per share does not have a significant effect on stock market volatility in the Nigerian stock market.

d. H_{04}: Market value per share does not have a significant effect on stock market volatility in the Nigerian stock market.

II. Conceptual Issues

The term relevance as a quality of accounting information as used in accounting literature is defined by the American Accounting Association (1966) as thus; "For information to meet the standard of relevance, it must bear on or be usefully associated with the action it is designed to facilitate or the result desired to produce. This requires that either the information or the act of the communicating exert influence on the designated action". Relevance thus implies the ability of the information to influence decisions of both potential and existing investors whether by changing or confirming their expectations about the result or consequences of actions or events (Novak. 2010). Dividend per share is defined as gross dividend divided by number of ordinary shares. It indicates the retention policy of the company as investors would always prefer higher ratio to continue to retain investment in the company (Siyanbola and Adedeji, 2014). According to Khan (2012), dividend per share is important for investors as they consider dividends not only the source of income but also a way to assess company from investment point of view and whether the company is cash generative or not. The International Accounting Standards Board (IASB) in its International Accounting Standards (IAS) define earnings per share as the amount of current period earnings or profit (or loss) attributable to a unit of ordinary share. Earnings per share have a significant impact on the stock price of an entity as it affects the calculation of an entities stock price (Idekwulim, 2014). Earnings per share can be used as a performance indicator of the financial standing of the company during the year and it indicates the progress of the company in the near future. The sum of the cumulative retained earnings and other entries under stockholder's equity is the book value of the equity of the entity (William, Gordon and Jeffery, 2004). Book value per share is one of the important variables which affect the market value of equity share as it is the value of own funds of a company per share and it expresses the worth of each share in a company. The book value is a reflection of the past earnings, dividend distribution policy of the company and investment decisions, hence, a high book value indicates that a company has huge reserves and is a potential bonus entity, while a low book value signifies a liberal distribution policy of bonus and dividends, or a poor track record of profitability (Pushpa and Sumangala, 2013). Lastly, the market value per share is the price at which a share of company stock can be acquired in the market place. When a small company loses a client contract, it may go bankrupt. But when a very large

company loses one single sales contract (client), it might not even make the news. So, stock of a large company is less volatile to changes in it's business or business prospect as compared to a smaller company

Theoretical and Empirical Considerations

The paper adopted the efficient market hypothesis as propounded by Fama (1965). This hypothesis was of the view that at any point of time, prices will fully reflect all available information about individual stock and the stock market as a whole. This is because when new information arrives, the news spread very quickly and is incorporated into the prices of securities immediately. Thus, according to the efficient market hypothesis, no market player has the advantage in forecasting stock price movements since no one has access to information that is not available to the entire market. Under the efficient market hypothesis, investors engage themselves in a game of chance and not skill, at any time they buy and sell securities. Therefore, it is, however, impossible to out-perform the market as prices normally incorporates and reflects all relevant information in the market. The efficient market hypothesis is not only concerned with the type and source of information, but also the quality and speed of which it is disseminated among inventors. This helps in questioning the type of information available and incorporated in stock prices (Kehinde, 2012). Amiri, Ravanpaknodezh and Jelodar (2015) posit that an efficient market is one in which stock price is adjusted to newly issued information and such information is used for pricing as an investor is assured that securities are valuable at the market price and the price reflects relevant financial information which affects stock prices. According to the Efficient Market Hypothesis (EMH), an operationally efficient stock market is assumed to be externally and informationally efficient; thus security prices at any point in time are an unbiased reflection of all the available information on the security's expected future cash flows and the risk involved in owning such a security (Reilly and Brown, 2003).

However, a lot of interests have been arisen on this area of accounting research but very few studies were documented in this paper. Thus, this study presented limited but important empirical studies done on this area of study. For instance, Ali (2017) investigated on accounting value relevance of earnings and book value of firms listed in Tunisian Stock Exchange from 2010 to 2015. Adopting OLS technique and using 28 quoted firms, the study found that the book value is more relevant than the earnings per share, whilst the combined value relevance of book value and earning has declined when firms have negative earnings. Ngoc and Manh (2017) studied on the relationship between accounting information in the financial statement and the stock returns of listed firms in Vietnam Stock Exchange using OLS, FEM, REM, GLS and GMM regression models within the period of 2012 to 2016. The result showed that the change in the rate of return, gearing ratio and the growth rate were positively correlated to the stock returns while the size of firms by assets is negatively related to stock returns. In the study done in Nigeria, Uduak, Emmanuel and Sunny (2017) investigated on stock price movements and the value of firms in Nigeria using secondary data research design and pooled data study approach. Five firms were selected for the study between 2005 and 2015. Data analyzed using Ordinary Least Square (OLS) regression technique showed that Earnings Per Share, Dividend Per Share, and Return on Shareholders' Funds were positively and significantly related to all the firms under investigation.

Tharmila and Nimalathasan (2016) studied on the impact of value relevance of accounting information on market vulnerability of the listed manufacturing companies in Colombo stock exchange (CSE) using one of accounting based measure of market vulnerability which is measured by market price per share. The sample of this study composed of twelve companies listed in the CSE and period of 5 five years from 2009 to 2013. Descriptive and inferential statistics were used for this purpose for the study. The results revealed that earning per share (EPS) and net assets value per share (NAVPS) significantly impact on market vulnerability. Osundina, Jayeoba and Olayinka (2016) studied on the impact of accounting information on stock prices volatility in selected quoted manufacturing companies in Nigeria for the period of 2005 to 2014. The study adopted an ex-post facto research design and econometric procedures since all data used were secondary. The study found that accounting information has a strong positive significant impact on stock prices volatility in Nigeria. Akinde (2015) examined the link between series of stock market fundamental and the proxy of real national development in Nigeria. Time series data collected from the fact book of Nigerian Stock Exchange and Central Bank of Nigeria's Statistical Bulletin from 1980-2013 were used. The study used Error Correction Model and carried out Granger Causality test, and found a significant positive relationship between the explanatory variables and explained variable at 5% confidence interval. Oloidi and Bolade (2015) analyzed the major variables that determine the equity share price of listed companies on the Nigerian Stock Exchange [NSE] publication as at 2011/2012 edition. Eighty companies were examined. The quoted price of the shares on 4th January 2011 was estimated by other explanatory variables. OLS regression technique was used to analyze cross-sectional data. Findings revealed that the previous year share price significantly and positively influenced equity share price at α=0.000 and earnings per share was negatively significant at α=0.05. Also revealed was that dividend per share positively and significantly influenced equity share price at α=0.014. The combined three variables explained the variation inequity share at an adjusted R – square value of 0.969. This showed that about 97 percent of the determinants of equity share price had been explained by these three explanatory

variables. From the above review, a gap can be established in area of number or type of variables used, size of data and or method of study in this paper. This constituted a contribution to knowledge.

III. Model Set Up and Sample Size

The paper sampled a total of ten quoted companies, which included Mobil Oil Nigeria Plc, Oando Plc, First Bank of Nigeria Plc, GTBank Plc, AIICO Insurance Plc, Niger Insurance Company Plc, Cadbury Nigeria Plc, Flour Mills Nigeria Plc, BOC Gases Nigeria Plc and Nigerian Enamel Plc out of 169 listed companies in the Nigerian Stock Exchange (NSE, 2018), which formed the population of the study. The paper selected two from five key companies, which were based on viability and data documentation for the study within the year under review. Their selection was also based on the fact that the companies have been listed on the Nigerian Stock Exchange (NSE) during the period and that the companies have the necessary financial statement data. The study further used a panel data analysis, which resulted in one hundred and seventy (170) observations.

The EGARCH model

The issue of volatility stock market is usually captured using Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) model developed by (Nelson 1991). The simple GARCH model capture symmetric shocks (positive shocks) and is unable to capture asymmetric shock (negative shocks). It is widely argued that negative shocks are likely to create more volatility than positive shocks having the same magnitude. The EGARCH model is able to capture both, symmetric and asymmetric shocks. Therefore, EGARCH model is selected in order to capture asymmetric volatility. The conditional variance of EGARCH (p, q) model according to Nelson (1991) is specified generally as;

$$\log(\delta^2_t) = \beta_0 + \sum_{i=1}^{q}\{\boldsymbol{\alpha i}\frac{\varepsilon t-i}{\delta t-i} + |\boldsymbol{\Upsilon i}|\ (\frac{\varepsilon t-i}{\delta t-i})\} + \sum_{i=1}^{p}\boldsymbol{\beta j log}\ (\delta^2_{t-j}) \quad (1)$$

$\varepsilon_{t-1} > 0$ and $\varepsilon_{t-1} < 0$ implies good news and bad news and their total effects are $(1 + \Upsilon i)\ \varepsilon_{t-1}$ and $(1 + \Upsilon i)\ \varepsilon_{t-1}$, respectively. When $\Upsilon < 0$, the expectation is that bad news would have higher impact on volatility. The EGARCH model in line with the description offered by Nelson (1991) achieves covariance stationarity when $\sum_{i=1}^{p}\boldsymbol{\beta j} < 1$. The major concern of this study is to model the conditional variance using EGARCH (1, 1) model, which is as specified below;

$$\log(\delta^2_t) = \beta_0 + \boldsymbol{\alpha i}\frac{\varepsilon t-i}{\delta t-i} + |\boldsymbol{\Upsilon i}|\ \frac{\varepsilon t-i}{\delta t-i} + \boldsymbol{\beta i}\log(\delta^2_{t-j}) + et \quad (2)$$

The total effects of good news and bad news for EGARCH (1, 1) are $(1 + \Upsilon_1)\ \varepsilon_{t-1}$ and $(1 - \Upsilon_1)\varepsilon_{t-1}$, respectively. β_0 and $\boldsymbol{\beta i}$ are the parameters to be estimated, $\boldsymbol{\alpha i}$ and $\boldsymbol{\Upsilon i}$ represent the accounting information and annual share price respectively, while et is the white noise. Failing to accept the null hypothesis that $\Upsilon = 0$, shows the presence of leverage effect, that is bad news have stronger effect than good news on the volatility of stock index return. Arising from the above model, the specification under which this paper followed involved stock market prices proxied by annual share prices (ASP) as the dependent variable while accounting information were disaggregated into dividend per share, earnings per share and book value per share, as exogenous variables. This was specified thus;

$$\log ASP_t = \alpha_0 + \alpha_1 \boldsymbol{\Delta} \log DPS_t + \alpha_2 \log EPS_t + \alpha_3 \log BVPS_t + \alpha_3 \log MVPS_t + \varepsilon_t \quad (3)$$

where, all variables remained as previously stated, log is the logarithm transformation and ε_t is the white noise. However, the above equation can be specified in its variance form, which gives credit to equation (4) as seen below;

$$\log(\delta^2_t) = \boldsymbol{\lambda} + \alpha \log(\delta^2_{t-1}) + \beta\frac{\varepsilon t-1}{\delta t-1} + \Upsilon\frac{\varepsilon t-1}{\delta t-1} + \mu_t \quad (4)$$

where, $\log(\delta^2_t)$ is the log transformation of conditional variance of stock market returns, ε_t is the white noise, α is the vector of coefficient, Υ is the leverage effect, and μt is the accounting information. In apriori, it is expected that all variables are non negative.

In the estimation procedures, the paper used the Levin, Lin & Chu (LLC), Augmented Dickey-Fuller (ADF) and the Philips-Perron (PP) unit root tests. The procedure is based on the following regression:

$$\boldsymbol{\Delta} ASP_t = \boldsymbol{\beta} t + \alpha ASP_{t-1} + \sum_{i=1}^{k}\boldsymbol{di}\boldsymbol{\Delta} DPS_{t-2} + \boldsymbol{\Delta} EPS_{t-3} + \boldsymbol{\Delta} BVPS_{t-4} + \boldsymbol{\Delta} MVPS_{t-5} + \mu_t \quad (6)$$

Where μ_t is a white noise error term and $\boldsymbol{\Delta} ASI_{t-1} = ASP_{t-1} - DPS_{t-2}$; $\boldsymbol{\Delta} DPS_{t-2} = EPS_{t-2} - EPS_{t-3}$ and so on. Equation 6 tested the null hypothesis of a unit root against a trend stationary alternative. The Phillips-Perron (PP) test was equally conducted with models similar to that of ADF approach on the variables but with Newey West non-

parametric correction for possible autocorrelation rather than the lagged variables method employed in the ADF test. Equation (7) below reported the Philips-Perron (PP) specification:

$$\boldsymbol{\Delta}\text{ASP} = \delta_1 + \Upsilon\text{DPS}_{t-1} + \Upsilon_t\boldsymbol{\Delta}\text{EPS}_{t-1} + \Upsilon_t\boldsymbol{\Delta}\text{BVPS}_{t-1} + \Upsilon_t\boldsymbol{\Delta}\text{MVPS}_{t-1} + - - - + \Upsilon_p\boldsymbol{\Delta}\text{ASP}_{t-p} + \mu_t \quad (7)$$

where $\delta 1$ may be zero, φ or $\varphi + \boldsymbol{\beta}$. The Philips-Perron equation is however regarded as a modified version of the Dickey-Fuller test (Philip and Perron, 1988). However, if two time series are found to be integrated of the same order, the implication is that such study can proceed to conduct a co integration test. Consequently, the study will also employ a cointegration test after ascertaining that the variables are stationary at a particular order. Thus, the Johansen cointegration specification for the existence of cointegration vectors is therefore stated as follows:

$$\boldsymbol{\Delta}\text{ASP} = \phi v_{t-1} + \sum_{i=1}^{k} \boldsymbol{\lambda 1\Delta}_{t-1} + \text{LDPS}_{t-j} + \text{LEPS}_{t-k} + \text{LBVPS}_{t-j} + \text{LMVPS}_{t-j} + \mu_t \quad (8)$$

However, if the study finds the existence of one integrating relation between the variables in the model, we proceed to derive the Error Correction Mechanism (ECM) of the form as specified below;

$$\boldsymbol{\Delta}\text{LASP}_t = \mu_2 + \sum_{j=1}^{k-1} \boldsymbol{\Gamma 12}(j) + \boldsymbol{\Delta}\text{LASP}_{t-j} + \sum_{j=1}^{k-i} \boldsymbol{\Gamma 22}(j)\text{LDPS}_{t-j} + \Pi_{21}\text{LEPS}_{t-k} + \Pi_{22}\text{LBVPS}_{t-j} + \Pi_{22}\text{LMVPS}_{t-j} \quad (9)$$

$$\boldsymbol{\Delta}\text{LDPS}_t = \mu_1 + \sum_{j=1}^{k-1} \boldsymbol{\Gamma 11}(j) + \boldsymbol{\Delta}\text{LDPS}_{t-j} + \sum_{j=1}^{k-i} \boldsymbol{\Gamma 12}(j)\text{LEPS}_{t-j} + \Pi_{11}\text{LBVPS}_{t-k} + \Pi_{22}\text{LMVPS}_{t-j} + \Pi_{12}\text{LASP}_{t-j} \quad (10)$$

Where the matrix Γ represents the short run dynamics of the relationship between accounting information and the stock market prices and the matrix Π captures the long run information in the data. All data were obtained from the Nigerian Stock Exchange Factbook, Annual Financial Reports of the quoted companies on the Nigerian Stock Exchange under review. The data of share prices were collected from the Nigerian Stock Exchange database. The stock price index (that is, ASP) was sourced from Nigerian Stock Exchange (NSE) online database (i.e. www.nse.com.ng)

IV. Results and Discussions

The data engaged in this study were examined for the presence of unit root using the LLC, ADF and PP method, which is based on the Dickey–Fuller procedure. The null hypothesis for these tests is that there is a presence of non-stationary series against the alternative hypothesis of stationary series. The unit root test is important because non-stationary series regression estimation leads to spurious regression estimations with the wrong magnitude and sign of the parameter of the regressors. Based on the result, the study failed to reject the null hypothesis of a panel unit root in the level of the series and concludes that the variables are non-stationary at level. Hence, all series were stationary after the first difference I (1), which confirmed that the data included in the study were useable. Table 2 shows the summary result of the panel unit root test.

Table 2: Summary of Panel Result of Unit Root Tests form ADF Approach

	Level			**First Difference**				
Variables	**LLC t-statistic**	**ADF t-statistic**	**PP t-statistic**	**LLC t-statistic**	**ADF t-statistic**	**PP t-statistic**	**Order**	**Prob.**
ASP	5.53497	3.94575	14.5000	-7.29014	38.7868	100.408	I (1)	0.0000
DPS	3.36468	11.1117	13.4916	-5.52524	57.2486	113.386	I (1)	0.0000
EPS	3.02970	14.5397	16.8810	-4.77607	60.1104	127.824	I (1)	0.0000
BVPS	2.30680	8.36214	8.09713	-3.24965	55.7349	116.226	I (1)	0.0000
MVPS	0.50422	17.8983	14.3834	-8.83796	72.5777	106.042	I (1)	0.0000

*Not stationary at any %

**Stationary at 1%, 5% and 10%

Sources: E-view 9.0

The results of the panel unit root tests showed that at level, the critical values at 1%, 5% and 10% of all the series were greater than the LLC, ADF and PP test statistic and hence were not stationary. However, all series (ASI, DPS, EPS, BVPS and MVPS) were stationary after differencing them once 1(1). This implied that the data engaged in this study have been confirmed useable, which guaranteed further test of co integration to examine the long run relationship among the series. Table 3 reported the panel co integration test as shown below:

Results of Panel Co Integration Test

Having confirmed that the data employed in this study are stationary at I (1), the study proceeded to conduct the co integration test to determine if there exist a long run relationship between accounting variables and stock market volatility proxied by all share index and the result is as shown below:

Table 4: Results of Panel Co integration Test

Alternative hypothesis: common AR coefs. (within-dimension)

Weighted				
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	1.863877	0.0312	-1.052573	0.8537
Panel rho-Statistic	-3.323555	0.0004	1.375502	0.9155
Panel PP-Statistic	-14.43972	0.0000	-2.410984	0.0080
Panel ADF-Statistic	2.614009	0.9955	-1.350422	0.0884

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	2.486805	0.9936
Group PP-Statistic	-3.173176	0.0008
Group ADF-Statistic	-0.904720	0.1828

Cross section specific results

Phillips-Peron results (non-parametric)

Cross ID	AR(1)	Variance	HAC	Bandwidth	Obs
OANDO	-0.648	30870.26	29862.11	1.00	16
MOBIL	0.317	103.7551	102.3712	2.00	16
GTBank	0.242	21.55924	17.01115	7.00	16
FIRSTBK	0.405	11.36051	9.104675	3.00	16
NIGERINS	0.017	13.53620	11.77049	2.00	14
AIICOINS	-0.076	0.576065	0.404819	3.00	16
FLOUR	0.151	82.13469	30.13503	8.00	16
CADBURY	0.121	15.71002	15.96842	1.00	16
ENAMEL	-0.207	1.163151	0.636850	4.00	16
BOC	0.189	1.778115	0.574277	10.00	16

Augmented Dickey-Fuller results (parametric)

Cross ID	AR(1)	Variance	Lag	Max lag	Obs
OANDO	-0.699	31239.00	1	--	15
MOBIL	0.088	97.99111	1	--	15
GTBank	-0.227	14.50133	1	--	15
FIRSTBK	0.183	10.40460	1	--	15
NIGERINS	-0.262	14.50807	1	--	12
AIICOINS	-0.366	0.553032	1	--	15
FLOUR	-0.144	80.59672	1	--	15
CADBURY	-0.003	14.85664	1	--	15
ENAMEL	-0.458	1.190012	1	--	15
BOC	-0.240	1.490281	1	--	15

Source: E-view 9.0:

The result of panel co integration test as presented above suggested that all series were cointegrated in all the listed companies in the Nigerian Stock Exchange. This findings indicated that accounting variables such as dividend per share, earnings per share, book value per share and market value per share exhibited a stable long run relationship with all share index in all the listed companies under review.

Short run Dynamics Panel Test

The study has verified that there is a long run relationship existing among the variables (i.e. annual share price, dividend per share, earning per share, book value per share and market value per share) but there may be tendency for disequilibrium to occur in the short run and that necessitated the test of panel of Error

Correction model (ECM). This test was conducted to estimate the pace of adjustment in case of disequilibrium and the summary result is as contained in table 5 below:

Table 4: Summary of Short run Dynamics Panel Test

Total panel (balanced) observations: 160

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.048152	2.96E-18	1.63E+16	0.0000
DLOG(DPS)	-0.064152	1.47E-17	-4.37E+15	0.0000
DLOG(EPS)	0.135330	1.05E-17	1.29E+16	0.0000
DLOG(BVPS)	-0.039277	9.20E-18	-4.27E+15	0.0000
DLOG(MVPS)	1..457654	6.43E-19	8.534285	0.0000
ECM(-1)	-0.984370	6.74E-18	-1.48E+17	0.0000

R^2 = 0.99; Adj R^2 = 0.98; F-statistic = 5.54; DW = 1.87

Source: E-view, 9.0

From the above results of **s**hort run dynamics panel test, the study first estimated equation (3) as specified in chapter three. The equation became necessary in order to state the constant and the parameter estimates as contained in equation (11) below:

$ASP_t = 0.048152 - 0.064152DPS_t + 0.135330EPS_t - 0.039277BVPS_t + 1.457654 + \varepsilon_t$ (11)

(1.63E+16) (-4.37E+15) (1.29E+16) (-4.27E+15) (8.534285)

where all variables are as previously defined and the values in parenthesis are the asymptotic t-values.

Results of Modeling Volatility from ASP Model

In chapter three, it was stated that the study adopted an EGARCH (1, 1) model. This is so because the study is intended to examine both the symmetric and asymmetric effect of accounting variables such as dividend per share, earning per share, book value per share and market value per share on stock market volatility. However, the conditional standard deviation was engaged in the variant of the mean specification instead of the conformist conditional variance. Therefore, the study first employed a GARCH (1, 1) to estimate the conditional variance of all the variables specified in the model. Thereafter, the volatility of the stock market and the accounting variables were introduced in the conditional variance of all the selected quoted firms in the Nigerian Stock Exchange market using an EGARCH (1, 1). and the summary results are as reported in table 5 below, while details of the results can be found in appendices 17 to 26

Table 5: Summary Results of Accounting Variables and Stock Market Volatility from ASP Model

Variables	OANDO	MOBILE	GTBank	FIRSTBK	NIGERINS	AIICOINS	FLOUR	CAD	ENAMEL	BOC
C	0.171938	0.231932	0.114611	0.292133	0.018816	0.287263	0.126173	-0.052697	0.486042	0.683332
DPS	-0.925277	1.925277	0.531429	-1.224467	0.144181	-3.171397	0.309316	2.545773	-1.033119	-3.955576
EPS	0.523847	4.423847	-1.100719	-0.149985	0.673783	-0.531907	0.202696	-0.011786	-3.416884	-1.169636
BVPS	-2.091822	-2.255632	-0.224634	-1.419823	0.767287	-0.575-89	-0.032043	-0.655556	0.106348	-0.06794
MVPS	4.632543	5.846265	1.676352	0.673821	-1.056275	-1.729235	0.945362	3.824524	0.624912	2.856367
R^2	0.829406	0.629406	0.772357	0.919702	0.821050	0.587174	0.632090	0.457277	0.847474	0.583706
Adj.R^2	0.829406	0.629406	0.772357	0.919702	0.821050	0.587174	0.632090	0.457277	0.847474	0.583706
F(Stat.)	46.88958	28.88958	14.77222	89.45080	29.30631	14.50740	9.601285	5.674065	79.71935	44.65051
Prob.	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000002	0.000000	0.000000
DW	1.856323	1.626894	1.583287	1.701744	1.324582	1.536274	1.788398	1.619115	1.670265	2.188883
AIC	0.869177	1.255471	0.357441	1.201299	0.270850	1.073431	1.283976	0.516757	0.774627	0.431742
SIC	0.855471	1.256826	0.343735	1.578593	0.657144	0.071439	1.221984	0.854764	1.112634	0.769749

Source E-view 9.0

From the result of an EGARCH (1, 1), it can be inferred that some of the series in some selected firms as reported above are negatively related to stock market volatility while other series in some firms were positive in response to stock market behavior. Specifically, in dividend per share, firms like OAUDO, FIRSTBK, AIICOINS, ENAMEL and BOC exerted negatively to stock market volatility while MOBIL, GTBank, NIGERINS, FLOUR and CADBURY showed positively in response to the volatility of stock markets. In earnings per share, OAUDO, MOBIL, NIGERINS and FLOUR exhibited positively while other firms were negatively related to stock market volatility. In book value per share, all the firms under review excepting

NIGERINS and ENAMEL, which seemed to be positive were found to be negatively related to stock market volatility. Finally, in the market value per share, NIGER insurance and AIICO insurance were found to be negative, while all other firms engaged in the study were positive in relation to stock market volatility. This implies that the market value of all the shares bought by the insurance companies included in the study have not been favourable within the period under review. Overall. the empirical evidence as provided above justified the application of EGARCH (1, 1), which examined both the symmetric and asymmetric effect of the variables under investigation.

The findings of this paper coincide with the recent study of those of Uduak, Emmanuel and Sunny (2017) who investigated on stock price movements and the value of firms in Nigeria using selected five firms and documented that earning per share has a positive and significant relationship with the Mobil Oil Nigeria Plc and also a positive butnon-significant relationship with Niger Insurance, Oando and Flour Mills but a negative and significant relationship with GTBank Plc at 5 percent significance level. Also, DPS shows positively significant relationship with Flour Mills and positively non-significant relationship with GTBank Plc. However, the results obtained in this paper rather contradicted with those of Tharmila and Nimalathasan (2016) who studied on the impact of value relevance of accounting information on market vulnerability of the listed manufacturing companies in Colombo stock exchange (CSE) and the results revealed that earning per share (EPS) and net assets value per share (NAVPS) significantly impact on market vulnerability. Again, the study revealed that increasing return on equity, improvement in earnings per share and size of the firm in terms of market capitalization are likely to improve the market price of the share. Finally, the result of the paper is consistent with the findings of Osundina, Jayeoba and Olayinka (2016) who studied on the impact of accounting information on stock prices volatility in selected quoted manufacturing companies in Nigeria for the period of 2005 to 2014, and found that accounting information has a strong positive significant effect on stock prices volatility in Nigeria.

Test of Hypotheses

Hypotheses One:

Decision: Reject Ho if t-cal > t-tab or p – value greater than 0.05, otherwise accept Ho
Results: t-cal = -0.064152 while t-tab = 2.00000
Conclusion: Based on the above results, the study rejected the Ho and concluded that reported dividend per share has a significant effect on stock market volatility in the Nigerian stock market.

Hypotheses Two:

Decision: Reject Ho if t-cal > t-tab or p – value greater than 0.05, otherwise accept Ho
Results: t-cal = 0.135330 while t-tab = 2.00000
Conclusion: Based on the above results, the study rejected the Ho and concluded that reported earnings per share have a significant effect on stock market volatility in the Nigerian stock market.

Hypotheses Three:

Decision: Reject Ho if t-cal > t-tab or p – value greater than 0.05, otherwise accept Ho
Results: t-cal = -0.039277 while t-tab = 2.00000
Conclusion: Based on the above results, the study rejected the Ho and concluded that reported book value per share has a significant effect on stock market volatility in the Nigerian stock market.

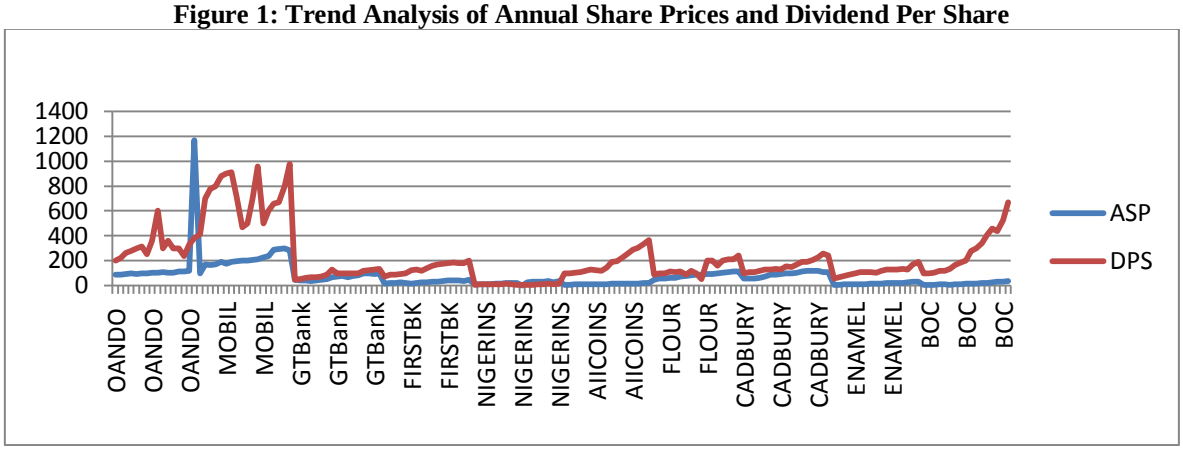
Hypotheses Four:

Decision: Reject Ho if t-cal > t-tab or p – value greater than 0.05, otherwise accept Ho
Results: t-cal = -0.039277 while t-tab = 2.00000
Conclusion: Based on the above results, the study rejected the Ho and concluded that market value per share has a significant effect on stock market volatility in the Nigerian stock market.

Graphical Analysis of Annualized Share Prices on DPS, EPS, BVPS and MVPS

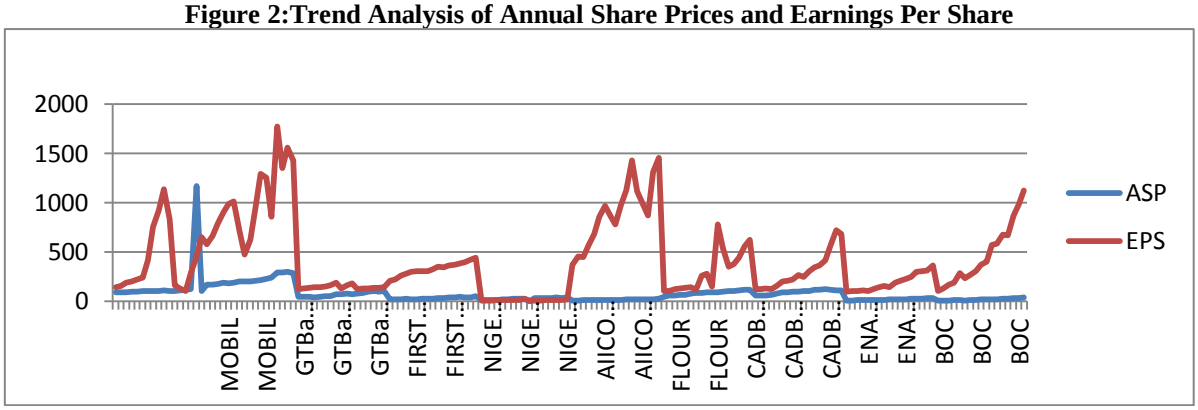
In order to identify the effect of value relevance of accounting information on stock msrket prices, trend analysis of all the accounting variables such as ASP and DPS, ASP and EPS, ASP and BVPS, and ASP and MVPS were illustrated as shown in the graphs below;

Figure 1: Trend Analysis of Annual Share Prices and Dividend Per Share



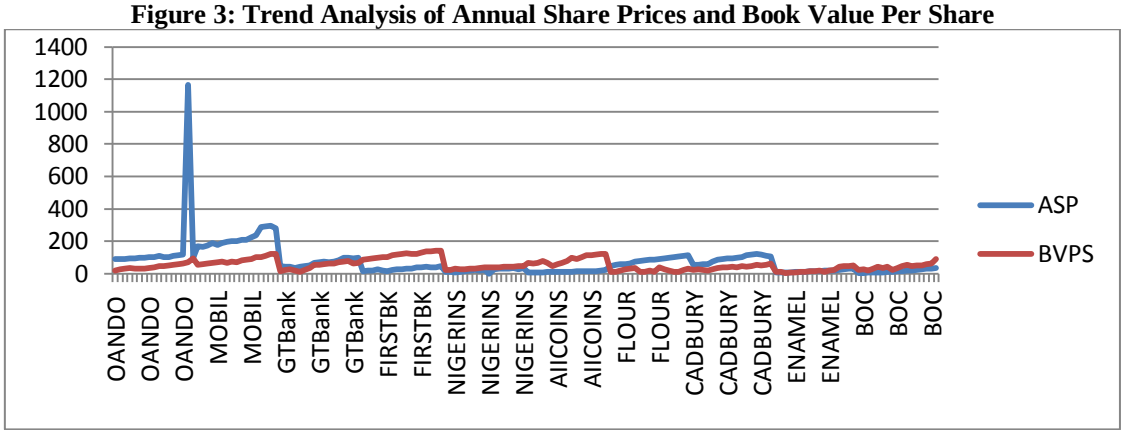
Sources: Author's Illustrations Using E- Views 9.0

Figure 2:Trend Analysis of Annual Share Prices and Earnings Per Share



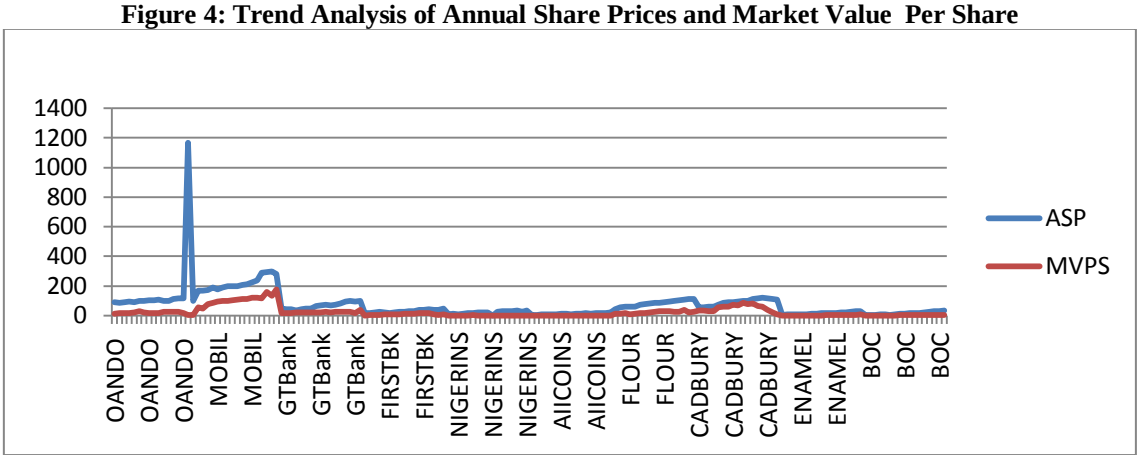
Sources: Author's Illustrations Using E- Views 9.0

Figure 3: Trend Analysis of Annual Share Prices and Book Value Per Share



Sources: Author's Illustrations Using E- Views 9.0

Figure 4: Trend Analysis of Annual Share Prices and Market Value Per Share



Sources: Author's Illustrations Using E- Views 9

Figures 1, 2, 3 and 4 depict the trends of the accounting variables in relation to annual share prices of the quoted companies within the period under review. For instance, in figure 2 where annual share price was presented in relation to dividend per share, OANDO company stood at 1120, which is far higher than the share prices of all other companies listed in this study. This monumental increase could be attributed to the contribution of the company in the development of Nigerian stock exchange. Again, MOBIL company had a share price of 500, while other companies showed a downward trend reaching close to the horizontal axis. The annual share prices of the companies further revealed that OANDO, MOBIL, GTBank, FIRSTbank, FLOUR mill and CADBURY had a higher trend compared to the rest of the companies included in the study. On the other hand, the trend of dividend per share, earnings per share, book value per share and market value per share in figures 1, 2, 3 and 4 respectively were mixed in explaining annual share prices in the companies under review.

Specifically, in dividend per share, MOBIL took a share value of 980 followed by OANDO with 600 shares, FIRST bank with 200, AIICO with 390 and BOC having a share of 740. In earnings per share, the trend revealed that the oil sector (MOBIL and OANDO) in this study performed extremely high reaching a share of 1800 and 1110 respectively. This development is not shocking as it is in line with the activities of the oil sector compared to other sectors of thr Nigerian Stock Exchange. Furthermore, the earnings per share of AIICO insurance and FLOUR mill respectively stood at 1400 and 800, which suggest that the share earnings of these companies have been higher compared to those of other sectors within the study. However, in book value per share, the trend revealed that only the oil sector (OANDO and MOBIL) and the financial sector (GTBank and FIRST) showed an upward trend, indicating that the two sectors have been recording their financial transactions in respect to the number of shares bought and sold, whereas the trend showed that other companies were not documenting their share transactions appropriately. Finally, in market value per share, the trend as contained in figure 5 showed that oil sector as MOBIL and OANDO have continued to exhibit an upward trend compared to other companies that have a flatter trend suggesting that the market values per share have been steady and had continued to maintain that trend for the periods under review. Thus, it may be deduced from the trend analysis that the oil sector such as OANDO and MOBIL, followed by the financial sector (GTBank and FIRST) have been performing better than other sector included in the study in terms of dividend per share, earnings per share, book value per shared, and market value per share within the periods under review.

V. Conclusion and Recommendations

So far, this study has been able to show that accounting information and its variables are key instruments for the analysis of stock market volatility in some quoted companies in Nigeria Stock Exchange (NSE). It is therefore evident in some empirical study (e.g. Osundina, Jayeoba and Olayinka,2016;, Abiodun, 2012 and Miah, 2012), that a critical analysis of these accounting variables will go a long way in controlling the stock market movement and consequently give confidence and value relevance to those who may wish to invest in stock markets. Based on the available results, the following are recommended:

a. Since the dividend per share was found to have a significant effect on stock market volatility, it is recommended that investors should be consistent about the performance of this specific accounting variable in an attempt to making their portfolio decision. This will be a guide to knowing whether or not to increase or decrease their investments or shares acquisition.

b. The listed companies in this study should ensure that they improve on their earnings per share even though it was found to be significantly related to the stock market behaviour. This will ensure that their earnings per share will cover their stock market prices.

c. Since the study documented that book value per share was negatively related to almost all the firms under review, it is therefore suggested that there should be a cumulative retained earnings, documentations and other entries under the equity of stockholders.

d. Market value per share is very vital in stock market behavior, therefore the study recommended based on the result of this variable that investors in the stock market should improve on the volumes of their investments in order to maintain their market value per share.

e. Government and the regulatory agencies should provide enabling environment that will ensure strict adherence to code of corporate governance and sound confidence of investors so as to improve their value relevance.

f. Finally, it is recommended that accounting professionals, portfolio managers, investors should strive more towards fundamental parameters of day to day business rather than engaging in stock market data, which may affect their stock yields.

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