JOURNAL OF APPLIED FINANCIAL ECONOMETRICS
Vol. 3, No. 2, 2022, pp. 235-253

URL : www.arfjournals.com
https://DOI:10.47509/JAFE.2022.v03i02.07

ACCOUNTING INFORMATION ASYMMETRY AND STOCK RETURN VOLATILITY

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Article History

Received : 17 November 2022
Revised : 05 December 2022
Accepted : 11 December 2022
Published : 29 December 2022

To cite this article

ODIA, James. O. & OSAZEVBARU, Henry Osahon (2022). Accounting Information Asymmetry and Stock Return Volatility. *Journal of Applied Financial Econometrics,* Vol. 3, No. 2, pp. 235-253. *https://DOI:10.47509/JAFE.2022.v03i02.07*

Abstract: The paper examined accounting information asymmetry and stock return volatility in the Nigeria Stock Exchange (NSE). It contributed to this discourse by testing the hypothetical proposition that accounting information asymmetry (contained in earnings per share (EPS) and operating cash flow per share(OPS) has no significant influence on stock return volatility. The study used a sample of 43 quoted firms on the NSE from 2006 to 2017. To capture the heteroscedacticity component of financial series, the study adopted asymmetric non-linear models of EGARCH (11) and GJR-GARCH (11). The results of the EGARCH (11) and model showed that EPS and OPS significantly reduced stock return volatility. In the GJR-GARCH (11) model, the two variables were also found to reduce volatility due to the negative sign of the parameter estimates, but only EPS was significant. Furthermore, the results indicated that significant negative shocks and presence of volatility clustering, but leverage effect was not established in both models.The persistence of shock in volatility measured by the impulse response function was found to be short-term. Therefore the paper concluded that asymmetric accounting information significantly influenced the stock return volatility in the Nigerian capital market. It is recommended that the regulatory authorities of the Nigerian capital market should strengthen measures that would enable free flow of information and encourage firms to disclose and make financial information public in order to guarantee relevant information to market participants for their investment decisions.

Keywords: Accounting information asymmetry, leverage effect, volatility, stock returns

1. INTRODUCTION

One of the most important information resources for investors' decision concerning stock price is the accounting figures reported by a firm. The International Accounting

Standard Board [IASB] (2010) and Financial Accounting Standard Board [FASB] (2010) stated that one of the purposes of accounting was to inform investors on aspects that help them predict future economic events that are relevant in determining company value. Consequently, accounting measures must reflect the underlying economic phenomena that they are designed to capture. It is on this ground they can serve in establishing stock prices that guide efficient capital allocation (Anatas & Olufemi, 2019).Accounting will not convey useful, relevant and reliable information if it is biased, untimely, and manipulated (Mahmood, Froogh & Ahmad, 2012).This could be due to the inability to capture certain significant aspects of transactions, which also do not meet all the criteria specified by the standard setters. Also, the case of manipulation of accounting information is evident when managers use their discretions to temporarily manipulate earnings in order to meet performance goals, to boost stock price prior to a security offering, or before executing their stock options to meet debt covenants.

Earnings management may be performed by opportunistic adjustments in the accounting methods used to determine accrual or by temporary changes in real economic policies (Roychowdhury,2006). All these accentuate information asymmetry and can send misleading signal about a firm's economic position to investors. In the light of the foregoing, the ability of accounting figures to capture the most significant traits of economic phenomena is thus an empirical question. Mixed results abound on accounting information disclosure, its asymmetry and stock return volatility. For instance, Mahmood et al (2012), Ali (2017) and Hung, Ha and Binh (2018) are of the view that disclosure is capable of reducing stock price volatility through reduction of the magnitude of news impact on firm performance, reduction in information asymmetry as suggested by the market microstructure theory because personal judgments that might be inferred into financial reports and transaction structures are eliminated, and increasing the homogeneity in beliefs of investors about the true value of the firm. Conversely, Chae (2005) and Bolibok (2017) averred that an increase in disclosure will make more information available and cause drastic price movements since stock trades on the basis of information. Also, more disclosure will require intelligent investors to interpret and where the level of accounting education is low; analysts can miscomprehend such information thereby increasing stock price volatility.

Mgbame and Ikhatua (2013) submitted that a theoretical link between accounting information and stock price volatility can be established and that the conditional variance of accounting information is a subset of the conditional variance of stock returns established in the theory of market efficiency.To this end, if current accounting information is uncertain, it will increase uncertainty of firm's future cash flows and hence more volatile future stock returns are expected. Some empirical evidence like those of Glezakos, Mylonakis and Kafouros (2012), Omokhudu and Ibadin (2015) and

Delkhosh and Poorkazem (2016) suggested that accounting is indeed successful in delivering information that is useful for estimating company value and that stock return volatility tends to increase around accounting information events.These results indicate that accounting information helps in predicting the future value generated by the firm and hence in company's valuation.

Be that as it may, a sizeable proportion of prior empirical studies have focused on analyzing information asymmetry and leverage effect using the All Share Index [ASI] instead of accounting variables (Emenike & Aleke, 2012; Herbert,Ugwuanyi & Nwaocha,2019; Omokehinde, Abata, Somoye & Migiro,2017). The ASI contains both market information, of which firms' financial information is a component as well as non-market information such as political news, noise and fads. But the analysis of asymmetry of accounting information has not been rigorously studied. Also, majority of the previous studies have applied linear regression by assuming homoscedasticity in the data, and thereby used Ordinary Least Square (OLS) or panel data (fixed and random effect) regression models with stock price or return as the dependent variable. See Aiyabei,Tobias and Macharia (2019), Al-Farah, Almeri and Shanikat (2014), Ali (2017), Amahulu, Abiahu, Obi and Nweze (2018), Avdalovic (2018), Cahyaningrum and Antikasari (2017), Ohlson (1995), Omokhudu and Ibadin (2015), Osundina, Jayeoba and Olayinka (2016) and Uniamikogbo, Ezennwa and Bennee (2018). However, the time-varying properties of financial variables cannot be adequately measured by linear models (Appiah-Kusi & Menyah, 2003) to capture volatility clustering and leverage effect. This study recognized this facts and therefore adopted the non-linear generalised auto-regressive conditional heteroscedasticty (GARCH) model. This paper also noted that stock market does not always exhibit symmetric information wherein all investors demonstrate homogeneous expectations.To accommodate this, non-linear asymmetric models of E-GARCH and GJR-GARCH were applied to differentiate between modelling stock and stock price volatility arising from the disclosures of accounting information which have been omitted in most prior studies.

Therefore, the objective of the paper was to determine the influence of accounting information asymmetry on stock return volatility. The paper also examined whether there was presence of leverage effect, volatility clustering and persistence of shock following accounting information disclosure. The rest of the paper is divided into four sections. The immediate next section is the review of literature on accounting information asymmetry, earning per share and operating cash flow and stock return volatility. Section three dwells on the methodology and research hypotheses. Section four is the data analysis and discussion of results while the last section is the conclusion and recommendations. The paper contributes to capital market research from the

perspective of management relating to the concerns over the explanatory and predictive power and their asymmetries of accounting information on stock return volatility.

2. LITERATURE REVIEW

2.1. Asymmetric Information Asymmetry and Stock Return Volatility

Volatility refers to the risk associated with the upward and downward swings in the value of an asset. It is a useful summary measure of the likely effect of a change in returns on an asset's value. Most investors and stock market participants pay particular attention to the properties of stock market return volatility such as time-varying volatility, volatility clustering/pooling, long memory or long-term dependence and leverage effect because the stock market returns are a critical factor for investment decision-making (Tripathy & Gil-Alana, 2010). The stock returns volatility is a barometer or useful measure of uncertainty about the stock market and the country's macroeconomic environment. Market volatility has been attributed to the volatility of macroeconomic variables financial leverage, changes in expected returns to stock, interest rates, ex post dividends volatility, changes in the volatility of future cash flows, exchange and discount rates .According to Herbert *et al* (2019), volatility clustering is a prominent stylized fact which suggests that a large (small) market shock tends to be accompanied by a similar large (small) stock. In an efficient market, information is the basis of stock trade (Chae, 2005). Variations in stock prices will therefore be due to information flow to the market. Information can come in discrete bits which the market absorbs with perfect efficiency or it could unfold gradually in cyclical pattern overtime. In the view of Omokehinde, Abata, Somoye and Migiro (2017), information can come to the market either symmetrically or asymmetrically.It is symmetric if stock prices reflect fully all available information on the basis of homogeneous expectations of all investors thereby giving no room for mispricing. On the other hand, the market is information asymmetric if there is room to earn abnormal return that is not commensurate with the level of risk assumed. This suggests that there is divergence between the market value of the shares and their intrinsic values and normally arises where there is heterogeneous expectation.

The existence of information asymmetry in markets was first identified by Akerlof (1970) and extended by Leland and Pyle (1977). Information asymmetry describes a situation where one party to a transaction has privilege information which is explored to the detriment of the uninformed party (Okpara,2010b).A close link between management incentives to misrepresent and information asymmetry has been identified by Osazevbaru and Tarurhor (2020). This is against the backdrop that management is saddled with the responsibility of financial reporting for their firms. So, depending on what they want to achieve, they can withhold certain information and present only

general information to the public making them the informed party about their entity's real value. Abad and Rubia (2005) found evidence of information asymmetry in financial market when they observed that there are two categories of traders namely: uninformed traders also called liquidity traders and informed traders who trade on the basis of insider or privilege information to earn abnormal returns. Anifowose (2012) found significant information asymmetric effect on stock return volatility in the Nigerian capital market when he examined 40 equities listed on the floor Nigerian stock exchange using the E-GARCH model for the period January 2009 to June 2012.

Levi and Zhang (2008) found the correlation between information asymmetry and stock returns to be positive and noted that good news curtailed volatility. Okpara (2010b) examined the relationship between asymmetric information and dividend policy in Nigeria. Using OLS framework that incorporated unit root test (Augmented Dickey-Fuller test), Johansen co-integration test and the vector error correction model and data from 1984 to 2006, the study found a significant and positive relationship between dividend policy and asymmetric information. The study concluded that higher asymmetric information led to higher dividend policy confirming the dividend signaling model and that dividend policy Granger caused information asymmetry.

Emenike and Aleke (2012) used the NSE weighted ASI daily data from January 2, 1996 to December 30, 2011 to examine volatility for evidence of asymmetric effect. The study estimated GARCH (1 1), EGARCH and GJR-GARCH. Result of the GARCH (1 1) model shows evidence of both volatility clustering and persistence. In the EGARCH model, the estimate of the volatility effect shows positive coefficient which is contrary to the leverage effect theoretical sign. Implicitly, volatility is more from positive news than negative news. The GJR-GARCH shows negative statistically significant coefficient of the asymmetric volatility parameter and supports the E-GARCH result. In a related study, Omokehinde *et al* (2017) examined the effect of asymmetric information on stock returns volatility in Nigeria. Using daily ASI price from January 3, 2000 to November 29, 2016, the study estimated Asymmetric Power Autoregressive Conditional Heteroscedasticity (APARCH) model. The study found that the financial time series is reflective of an asymmetric information market with heterogeneous expectations of investors. Specifically, the paper found volatility persistence to be explosive with the coefficient greater than unity. The coefficient of asymmetric effect was found to be negative suggesting that bad news have more destabilizing effect on volatility though was not statistically significant. The result confirmed asymmetric or leverage effect where bad news had a more destabilizing effect on the volatility of stock returns than good new. This result conflicts with the earlier study by Emenike and Aleke (2012) who found good news to contribute more to volatility in the EGARCH model they estimated.

Herbert, Ugwuanyi and Nwaocha (2019) examines the phenomenon of volatility clustering and leverage effect (asymmetry) in stock returns of the Nigerian stock market, using the daily All Shares Index of the Nigeria Stock Exchange during 2010 to 2016 period. Using GARCH (1.1) and GJR-GARCH (1.1) in the data estimation, the results affirm the presence of volatility clustering, persistent clustering and significant leverage effects of stock returns in the Nigerian stock market. Uyaebo, Atoi and Usman (2015) examined the volatility of Nigeria, Kenya, South Africa, China, United States of America and Germany using the daily all share index (ASI) and the TGARCH and EGARCH models from 2000 to 2013.The results showed higher returns volatility reaction to market shocks, absence of leverage and low volatility persistence for the Nigerian and Kenyan stock markets compared to others.

2.2. Accounting Variables and Stock Return Volatility

Research efforts on stock price volatility have recently extended the frontiers of investigation to examining the effect of accounting numbers on stock price volatility. Glezakos, Mylonakis, and Kafouros (2012) not only examined the impact of accounting information on stock prices, but also whether there has been a change in the influence overtime. Using a sample of 38 companies randomly selected from the Athens Stock Exchange, over the thirteen years period 1996 - 2008, annual EPS and annual book value per share (BVPS) were related to share price. The study found a strong and statistically significant relationship between the variables regressed. Nayeri, Ghayoumi and Bidari (2012) also documented a relationship between accounting information and stock volatility in their study of factors affecting value relevance of accounting information for investors in Tehran Stock Exchange. Company size, growth and earning ability were found to influence stock price.

Wang, Fu and Luo (2013) investigated accounting information and stock price reaction of 60 listed companies in Shanghai Stock Exchange, China for the 2011. They adopted step-wise regression analysis and tested the following seven accounting variables: EPS, Income from main operation ratio, rate of return on common stockholders' equity (ROE), receivable turnover ratio, inventory turnover ratio, liquidity ratio and quick ratio. The study reported a positive relationship between accounting information and stock price. Specifically, the accounting information embedded in EPS and ROE were the most significant. This was followed by income from main operation ratio and quick ratio. Accounts receivable, turnover ratio and liquidity ratio were not significant. Shehzad and Ismail (2014) studied accounting information and changes in share prices using 19 banks listed on Karachi Stock Exchange of Pakistan over the period between 2008 and 2012. The accounting information examined are those contained in EPS and BVPS. Using panel least square regression, the study found both accounting numbers to be

statistically significant in explaining changes in share prices. However, a negative relationship was found between BVPS and changes in share price.

The ability of accounting variables to explain the volatility of stock prices have also been investigated by Al-Farah, Almeri, and Shanikat (2014). Using a sample of 64 industrial companies listed on Amman Stock Exchange in Jordan from 2001 to 2010, the study investigated the ability of the following six accounting variables; dividend payout ratio, dividend yield, company's market value, net income volatility, debt ratio and the company's asset growth, to explain volatility. Using multiple regression method, the study found that the six accounting variables jointly explained volatility in stock prices. However, the relation was relatively weak as the coefficient of multiple correlation was 19.4% and the coefficient of determination 3.8%.The results of the test of individual variables showed that only the dividend payout ratio was significantly correlated with stock price volatility while the other variables were not significantly correlated with stock price.

Omokhudu and Ibadin (2015) examined value relevance by the extent to which accounting information is associated with firm value. Using Ohlson (1995) model, and employing pooled and panel data regression of share price on accounting numbers for 47 firms over the period 1994 - 2013, the study found a significant association between accounting numbers and firm value. Specifically, the study found earnings, cash flow and dividend to be statistically and significantly related to firm value. But book-value was not significant though related to firm value. Osundina, Jayeoba and Olayinka (2016) studied five quoted manufacturing companies in Nigeria for the period 2005 - 2014. The approach involved the application of OLS cross- sectional fixed effect model on EPS, P/E ratio, BVPS, and DPS. The study found the coefficient of determination to be 89.1% and F-stat significant at 1% and concluded that accounting information had significant impact on stock price volatility. Ali (2017) studied 28 non-financial firms listed on Tunisian Stock Exchange from 2010 to 2015 using panel least square regression on EPS and BVPS data. The coefficient of determination from the two accounting variables on stock price volatility was 66.8% and both variables were found to be significant; but book value was more value relevant than EPS.

Cahyaningrum and Antikasari (2017) investigated the simultaneous or partial influence of EPS, MBV, ROA, and ROE on stock price of 237 listed finance sector companies on the Indonesia Stock Exchange from 2010-2014.Using multiple regression model, the study reported all the accounting variables to have significant positive influence on stock prices. Girish and Desai (2018) employed regression analysis to study the influence of EPS, DPS, and BVPS on share price of ten Nifty Pharma Index companies quoted on the National Stock Exchange, India for the period 2011-2017.Again, the three accounting variables were found to positively and significantly

influence share price. Avdalovic (2018) used individual companies data from 2008-2014 of listed financial and insurance sector firms on Belgrade Stock Exchange, Serbia. Employing OLS method, the study found ROA, BVPS and company size to explain stock prices.

Uniamikogbo, Ezennwa and Bennee (2018) used a sample of 22 firms listed on the Nigerian Stock Exchange (NSE) over the five year period of 2013 to 2017 to examine accounting information and volatility in stock prices. Using OLS model, it was found that EPS and DPS have negative and significant effect on stock price while BVPS had positive and significant effect. In the same vein, a study by Amahulu, Abiahu, Obi and Nweze (2018) using ICT firms quoted on the NSE over the period 2010-2016 reported DPS, EPS and ROE to have positive and significant effect on share price based on correlation and simple regression analysis. Aiyabei, Tobias, and Macharia (2019) investigated the influence of financial statement on idiosyncratic volatility of stock returns of 39 firms listed on Nairobi Securities Exchange. The period covered was from 1998 to 2017. Applying dynamic panel data regression, it was found that DPS has a significant relationship with idiosyncratic volatility.

3. METHODOLOGY

This study used a sample of 43 listed firms on the NSE. The selected firms cut across all the economic activity sectors of the market. Data on EPS, operating cash flow per share (OCFPS), and share price were collected for the period January, 2006 to December, 2017. The choice of this period was to enable us carve new dataset different from studies that have used data from 1990s to early 2000s, and also examine the periods after recapitalization of the banking sector and financial crisis. In fact, the period reflects long-term movements in the volatility of the asset returns with diversity of the market trends, turmoil and shedding of NSE performances (Herbert et al., 2019; Ibrahim,2017).Our data were sourced from NSE Fact book, Central Securities Clearing System (CSCS) Ltd, NSE daily price quotation, and financial statements of the firms concerned.

3.1. Models Specification

Researchers such as Okpara (2010a), Mgbame and Ikhatua (2013), Owidi and Mugo-Waweru (2016), Omokehinde *et al* (2017) characterized stock prices by volatility clustering, leptokurtic distribution and leverage effect. So, the GARCH family models were adopted for our study. This is because it is well suited to handle heteroscedastic and panel data where OLS estimation will yield spurious results. Again, modelling stock return volatility requires simultaneous modelling of returns and its variability measured by the conditional variance of the residuals. Since the GARCH family models always

specify a mean equation and a corresponding variance equation they are more appropriate for the analysis unlike panel data regression which do not. Therefore, the asymmetric Exponential GARCH or E-GARCH(11) model, and Glosten, Jagannathan and Runkle or GJR-GARCH (11) models were used for our estimation. We capture the asymmetric volatility behavior by using GJR-GARCH and E-GARCH models of asymmetric risk measurement like following prior studies such as Akashi *et al.,* 2018; Herbert *et al* (2019),

3.1.1. EGARCH Model

Nelson (1991) observed that the conditional variance in GARCH (p q) model depends only on the size of the shock and not the sign. In other words, it assumes symmetric volatility wherein the conditional variance does not change and is the same over the period. This makes the GARCH (p q) to ignore the information regarding the direction of returns. However, some markets exhibit asymmetric volatility wherein there is leverage effect and long memory. In other words, volatility responds asymmetrically to good news and bad news. To fill this gap, the EGARCH model was introduced. Modelling EGARCH guarantees that the conditional volatility of returns is always positive which often eliminates the need to impose certain parameter restrictions on the model coefficients in order for stationarity to be achieved (Goudarzi, 2010). The EGARCH (1 1) model estimated in this study is:

$$R_t = \mu_0 + {}_1R_{t-1} + u_t \qquad (1)$$

$$u_t/\phi_t \cong \text{iid } N(0, ht)$$

$$\log h_t = \beta 0 + \beta 1 \left| \frac{u_{t-1}}{\sqrt{h_{t-1}}} \right| + \beta 2 \frac{u_{t-1}}{\sqrt{h_{t-1}}} + \beta 3 \log h_{t-1} + \beta 4 AVi \qquad (2)$$

Equation (1) is the mean equation and it is essentially an autoregressive model for returns. R_t is the returns at time t and R_{t-1} is its lagged values. ϕ_t is the information set available at time t.

$$R_t = (P_t - P_{t-1})/P_{t-1}$$

Where P_t is the share price at time t and P_{t-1} is previous period's price.

Equation (2) is the variance equation with h_t as the variance scaling parameter. It is a function of the past values of the shock captured by the lagged square residual term, u^2_{t-1}, and past value of the scaling parameter, h_{t-1}. The log of the variance series makes the leverage effect exponential and guarantees the estimates of the conditional variance to be non-negative. In testing for asymmetries, the parameter of interest is β_2. If $\beta_2 = 0$, then the model is symmetric implying that positive and negative shocks of the same quantum have the same effect on volatility of stock returns. When $\beta_2 < 0$ and statistically

significant, then good news (positive shocks) generate less volatility than bad news (negative shocks) and otherwise when $\beta_2 > 0$.
AV_i represents the individual accounting variable and its estimate; β_4 indicates the effect of that accounting variable on volatility.

3.1.2. GJR- GARCH Model

The GJR-GARCH model also known as Threshold GARCH (TGARCH) is credited to Zakoian (1990) and Glosten, Jagannathan, and Runkle (1993). As a way of modelling asymmetric volatility, the conditional variance is influenced differently by u^2_{t-1} depending on the sign. This study estimates GJR-GARCH model of the form:

$$R_t = \gamma_0 + \gamma_1 R_{t-1} + u_t \quad (3)$$

$$u_t/\Phi_t \cong \text{iid N}(0, h_t)$$

$$h_t = \beta_0 + \beta_1 u^2_{t-1} + \beta_2 u^2_{t-1} \delta_{t-1} + \beta_3 h_{t-1} + \beta_4 AV_i \quad (4)$$

The mean and variance equations are captured by equations (3) and (4) respectively. The GJR-GARCH model accommodates asymmetries, that is positive and negative shocks, by adding a multiplicative dummy variable, δ, to check whether there is a statistically significant difference when shocks are negative. δ takes the value of 1 when $u_t < 0$, and 0 when $u_t > 0$ (Dimitrios & Hall, 2007). If β_2 is positive and statistically significant, when the accounting variables are incorporated into the model, then there are asymmetries. Clearly, bad news has a larger effect than good news on the volatility of the series as contributed by that particular accounting variable. β_3 is a measure of clustering in the conditional variance. Now, $\beta_1 + \beta_2/2 + \beta_3$ indicate persistence of shock in volatility. If this result is less than unity, then the shock is a short-term shock. On the other hand, if it is close to or greater than unity, then volatility is long-term.

We hypothesize as follows: (1) accounting information asymmetry does not influence stock returns volatility in the Nigeria Stock Exchange (2) Volatility clustering and leverage effect arising from accounting information do not exist in the stock returns volatility of the NSE

Table 1: Definition of Variables and Parameters

Parameters and Variables	*Definition of Parameters and Variables*
AV	Accounting variables (EPS and OCFPS)
EPS	Earnings per share (measured as profit after tax less Preference dividend divided by number of ordinary shares ranking for dividend
OCFPS	Operating cash flow per share (measured as operating cash flow divided by the number of ordinary shares

contd. table 1

Parameters and Variables	*Definition of Parameters and Variables*
Φ_t	Information set that is available at time t
β_0	the constant variance corresponding to the long-run average
β_1	Coefficient of Arch term which measures the magnitude of the shock of the news. Alternatively, it measures the symmetric effects of the last period shocks on current volatility.
β_2	Parameter that measures persistence in the conditional variance or parameter of the Garch component. It measures the asymmetric effect or leverage effect of the shock on volatility.
β_3	Measures the clustering in the conditional variance.
β_4	Coefficient of the accounting variables.
u^2_{t-1}	Arch term squared error term at time t-1.
h_{t-1}	Lagged conditional variance and it indicates volatility clustering.
Δ or δ	Drift parameter and multiplicative dummy variable.

Source: Authors' compilation

4. DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1. Descriptive Statistics

The result of the descriptive statistics of the variables is presented in Table 2

Table 2: Descriptive Statistics of the Variables

	SHARERET	*EPS*	*OCFPS*
Mean	0.276899	3.708225	7.949436
Maximum	28.63000	247.1000	347.3903
Minimum	-0.890000	-20.23000	-56.32000
Std. Dev.	1.935160	16.84440	29.57036
Skewness	10.73303	12.07476	7.380557
Kurtosis	138.2758	170.5950	74.49399
Jarque-Bera	403347.0	616432.4	114579.6
Probability	0.000000	0.000000	0.000000
Observations	516	516	516

Source: Authors' computation from Eviews 7·0

Table 2 shows the mean value of all the variables: share returns, EPS and OCFPS. For instance, the mean return is 0·28 while mean of EPS and OCFPS are 3·71 OCFPS is 7·95. The maximum and minimum values of the variables are also shown. For share returns, these values are 28·63 and -0·89 respectively. The standard deviation measures

how far apart the individual values are from their mean values. For share returns this value is 1·94, implying that returns deviated from mean by about 1·94% during the period under study. Similarly, EPS deviated from the mean value by 16.84% and OCFPS by 29.57%. The values for skewness, kurtosis and statistical significance of Jarque-Bera statistics showed the variables are not normally distributed.

4.2. Correlation Matrix

The correlation matrix is used to analyse the direction of the relationship among the variables of interest. It is also useful in detecting whether multicollinearity is present among the independent variables. According to Molyneux, Nguyen, and Zhang (2014), if correlation coefficient exceeds 0·80, then there is multicollinearity.

Table 3: Correlation Matrix

	EPS	*OCFPS*	*SHARERET*
EPS	1.000000	0.177826	-0.006236 **
OCFPS	0.177826	1.000000	-0.010298 **
SHARERET	-0.006236	-0.010298	1.000000

** Significant at 5%

Source: Authors' computation from Eviews 7·0

A quick look at the results in Table 3 shows that the two explanatory variables have significant negative relationship with share return. Furthermore, none of the correlation coefficient value exceeds 0·8 and so, there is no problem of multicollinearity among the explanatory variables.

As part of the diagnostic tests for this study, the unit root test was used to ascertain whether the data series is difference stationary (the null hypothesis) or trend stationary (the alternative hypothesis).The Augmented Dickey-Fuller (ADF) unit root test results in Table 4 revealed that all the data series were stationary both at level and at first difference. This result is based on the fact that the estimated tau-value is greater than the critical values at 1%, 5%, and 10% in absolute terms. Therefore the data could be used either in level or first difference forms.

Table 4: Result of Augmented Dickey-Fuller Unit Root Test

Variable	*At Level (tau-value)*	*At First Difference (tau-value)*
SHARERET	-22.49190 (0.0000)	-13.02992 (0.0000)
EPS	-8.842769 (0.0000)	-15.35867 (0.0000)
OCFPS	-7.441476 (0.0000)	-18.05739 (0.0000)

* Probability values in bracket

Source: Authors' computation from Eviews 7·0

4.3. Test of Hypotheses using EGARCH (1 1) and GJR-GARCH (1 1)

Firstly, the result of EGARCH (1 1) model is presented in Table 4

Table 5: Result of EGARCH (1 1) Model on Accounting Information Asymmetry and Stock Return Volatility

Mean Equation			
Variables	*Coefficient*	*z– statistic*	*Probability*
μ_0	0.027628	1.527183	0.1267
μ_1	0.014125	4.245311	0.0000***
Variance Equation			
β_0	2.016131	56.12369	0.0000***
β_1	-2.134370	-38.35383	0.0000***
$\beta_{2\,(\text{Asymmetric/leverage effect})}$	1.754878	27.12628	0.0000***
$\beta_{3\,(\text{Volatility clustering})}$	-0.376386	-13.47186	0.0000***
EPS	-0.016057	-6.168620	0.0000***
OCFPS	-0.010964	-5.838526	0.0000***

*** Significant at 1%

Source: Authors' estimates from Eviews 7·0

From Table 5, the coefficient of the lagged value of returns μ_1 is positive (0.014125) and statistically significant at 1% level. This means that current return is significantly influenced by past returns and they both move in the same direction. In the variance equation, all the parameter estimates, β_1, β_2, β_3, and β_4 are statistically significant at the 1% level meaning that they are important in explaining the effect of asymmetric information on stock return volatility. Specifically, the estimates for the accounting variables, EPS and OCFPS (-0.016057 and -0.010964 respectively) are negative indicating they significantly reduced the stock return volatility. This is consistent with Omokhudu and Ibadin (2015) and Osundina *et al.* (2016) but contradict the finding of Amahulu *et al* (2018) who reported positive relationship for EPS.

In testing for asymmetries, the important parameter is β_2. Note that the coefficient of β_2 (1.754878) is not equal to zero, implying that negative and positive shocks of the same magnitude do not have the same effect on volatility. This confirmed the presence of asymmetries in the financial information. In the same vein, the leverage effect (that is, bad news having more effect on volatility than good news) is not established because the coefficient is positive. Therefore, the good news effect of the financial variables under study contributes to reducing volatility. Clearly, while the evidence supports the fact that accounting information asymmetry has significant influence on volatility because

$\hat{a}_2$ is statistically significant, volatility is more from good news than bad news due to the positive value of $\hat{a}_2$. This finding supports Emenike and Aleke (2012).On the basis of this statistical evidence, the null hypothesis of no significant influence of accounting information asymmetry on stock return volatility is not accepted. This evidence suggests that the Nigerian stock market is characterized with non-homogenous expectations of investors.

This hypothesis is further tested using GJR-GARCH model represented by equations (3) and (4). The result of the estimation of the model is shown in Table 6.

Table 6 : Result of GJR-GARCH (1 1) Model on Accounting Information Asymmetry on Stock Price Volatility

Mean Equation			
Variables	*Coefficient*	*z– statistic*	*Probability*
γ_0	0.283187	0.853514	0.3934
γ_1	0.013785	0.101502	0.9192
Variance Equation			
β_0	2.464909	1.591739	0.1114
β_1	-0.007044	-2.224353	0.0261**
$\beta_{2\ (Asymmetric/leverage\ effect)}$	-0.126050	-0.236275	0.8132
$\beta_{3\ (Volatility\ clustering)}$	0.570594	2.056532	0.0397**
EPS	-0.010302	-2.027503	0.0426**
OCFPS	-0.007666	-1.343707	0.1790

** Significant at 5% level

Source: Authors' Estimates from Eviews 7·0

In Table 6, the parameter estimate of the lagged value of return,$_1$, is positive (0.013785) but not significant. Notwithstanding, it signifies that past returns can influence current period return. In the variance equation, the two financial variables, EPS and OCFPS, have negative coefficients (-0.010302 and -0.007666 respectively), with EPS statistically significant at 5% level. Implicitly, the two variables can reduce stock return volatility thus supporting the earlier study of Uniamikogbo, *et al* (2018). However, the significant influence comes from EPS.

To ascertain if bad news has a larger effect on volatility than good news, $\hat{a}_2$ must be positive and statistically significant. From the result, $\hat{a}_2$ is negative implying that good news affects volatility more than bad news, though not significant. While leverage effect is not significantly established, the negative sign of the parameter agrees with the result found in the EGARCH (1 1) model. Therefore the null hypothesis of no leverage

effect is accepted. The absence of the leverage effect support earlier studies by Uyaebo, Atoi and Usman (2015),and Ajayi and Nageri (2016) but differ from the significant leverage effect found by Atoi (2014), Omokehinde *et al* (2017) and Herbert *et al* (2019) β_3 which is a measure of clustering in the conditional variance is positive (0·570594) and statistically significant at the 5% level. This signifies the existence of clustering (that is large changes in returns tend to be followed by large changes and small charges by small changes) in the conditional variance. Thus null hypothesis of no clustering is rejected.The persistence of shock in volatility is measured by $\beta_1 + \beta_2/2 + \beta_3$. This is equal to 0·5005175 (that is, - 0·007044 – 0·126050/2 + 0·570594). As this value is less than unity, then the shock is a short-term shock which dissipates quickly.

In sum, the evidence from this result suggests that accounting information asymmetry has influence on stock return volatility. Again, this model result did not accept the null hypothesis. While this result supports the earlier study by Emenike and Aleke (2012), and Mgbame and Ikhatua (2013), it did not support that of Omokehinde et al (2017) who used APARCH and found that volatility persistence was neither explosive nor was bad news found to have more destabilising effect on volatility than good news.

5. CONCLUSION AND RECOMMENDATIONS

The free flow of information to a security market is the basis for stock trade. Such information comprises financial and non-financial information. Variations in the price of stock are therefore a reflection of the available information. Information can come to the market either in a symmetrical manner or in an asymmetrical manner. This paper focused on asymmetric accounting information where heterogeneous expectations of investors can give room for mispricing. The impact of this on stock return volatility was investigated. Evidence from the data analysed revealed that information conveyed by EPS and OCFPS significantly reduce stock return volatility. Similarly, accounting information asymmetry has significant influence on stock price volatility. Furthermore, clustering volatility persistence was found to be a short term one due largely to good news than bad news. The ability of this study to disaggregate and measure the impact of accounting information on stock return volatility is an improvement on prior studies that have modeled total market information (financial and non-financial) embedded mainly in the All Share Index.

The findings have policy implications for the regulation and policy expediency of measures that progressively checkmate the patterns of volatility in the Nigerian stock market as well as control negative news convey by the disclosure of accounting information such as earnings per share and cash flow as these can largely increase the level of market uncertainty and investors' exposure to risks In the light of the findings of this study, the following recommendations are suggested. (i) There should be free

flow of information in the capital market (ii) Firms should disclose and make their financial information public.This will expose market participants to avalanche of information which they can discount and impute into security prices.Under this condition, the security prices that prevailed at any time will be an unbiased reflection of all currently available information including the risk involved in owning the security. Accordingly, the expected returns implicit in the current price of the security will reflect its risk. Notwithstanding the efforts made by this study, we suggest further investigation in the following areas: (i) Use of more accounting variables, increase in sample size, and period of study. (ii) The leverage effect which was not supported by this study should be investigated further and (iii) more asymmetric volatility models other than the ones used in this study should be applied in further studies for more robust results.

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