Influence of Earnings per Share on Idiosyncratic Volatility of Stock Returns among Listed Firms in Kenya

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Abstract
Idiosyncratic volatility has not always been considered in pricing of financial assets; this is as a result of capital asset pricing model's proposition that idiosyncratic volatility is diversifies away and that investors hold portions of diversified portfolio. In reality however, this is not always the case. Research studies have revealed that investors do not always hold diversified portfolios and idiosyncratic risk is therefore priced in order to compensate their inability to hold the market portfolio, therefore the main objective of the study was to establish the effect of financial statement information on idiosyncratic volatility of stocks return among listed firms in Kenya. Idiosyncratic volatility was the dependent variable while independent variable was Earning Per Share (EPS). The study used correlational and descriptive research design, it also used census technique which targeted all 39 listed companies that existed and their shares were actively traded at the Nairobi Securities Exchange (NSE) from the year 1998 to 2017. STATA was used to generate Descriptive and inferential statistics. The study employed a dynamic panel data regression model, the analysis of variance (ANOVA) was used to reveal the overall model significance, the calculated F-statistic was compared with the tabulated F-statistic and a critical p-value of 0.05 was used to determine whether the overall model is significant. The study results found that there was a positive and significant relationship between EPS and Idiosyncratic Volatility of stock returns among listed firms in Kenya (r= 0.001, p=0.027), and therefore the null hypotheses were rejected. Based on the findings, the study concluded that, EPS has a significant relationship with Idiosyncratic Volatility of stock returns among listed firms in Kenya. The study recommended that market investors analyst should review their investment strategies taking into consideration EPS in pricing firm specific risk. These indicators will further guide in expanding the interpretation of the financial dynamics in the listed firms at the NSE and other related firms.
Keywords: Earnings per Share, Idiosyncratic Volatility, Stock Returns, NSE & Kenya.

1.1 Introduction
The value relevance of financial statement has grown significantly over the last two decades, this can be attributed to general acceptance and harmonization of accounting standards as well as global adoption of international financial reporting standard (IFRS) and international accounting standards (IAS). Value relevance is based on the pillars of reliability and relevance as well as the ability of financial information to summarize stock market data, it also describes the relationship between accounting information and equity prices (Liu & Liu, 2007). Basically, listed companies use published financial statements as a major away for communicating financial information to their shareholders and all stakeholders (Nassar, Uwuigbe, Uwuigbe & Abuwa, 2014). Studies have also shown that there is correlation between financial accounting information and equity price volatility in the securities market Zhou (2004), Sharma (2011), Halonen, Pavlovic and Persson (2013).

The use of published financial statements in investment decision at the stock exchange and its impact of equity price volatility has not been widely studies in Africa, studies done elsewhere have resulted in mixed findings. Halonen and Pavlovic (2013) analyzed the effect of EPS, EPS and BVPS on stock price of firms listed at Swedish equities market, their findings showed that equity price volatility is significantly affected by financial statement information. According to Spiegel and Wang (2005) idiosyncratic volatility and liquidity have an inversely relationship and conclude that the correlation between idiosyncratic volatility and market returns could also indicate both the relationship between liquidity and returns and the correlation between firm size and returns.

According to Wang and Chang (2008), there exist a significant and positive association linking stock price and book value and also between equity price and EPS at the Taiwanese stock exchange. De, Medeiros & Lago (2014) investigated the relationship between financial accounting information and volatility of share returns in listed Brazilian firms, the empirical findings showed that the level of financial accounting information disclosure has a significant and negative effect on securities market risk measured by stock return volatility. Almeri, Al-Farah, and Shanikat (2014) study did not find significant correlation between accounting information variables and stock volatility with the financial accounting information only explaining 2.6% of the volatility experienced in the stock prices. In his study, Abo Osba (2007) study found strong and highly significant correlation between share prices movement in the banking sector and cash dividend payout and the Amman Stock Exchange.

Studies has also found that, for some reasons, investors always do not hold diversified portfolio which

usually eliminate significantly idiosyncratic volatility as supported by CAPM (Fazil, 2013). Goetzman and Kumar (2008) found that 25% of investors hold only one stock, and 50% of investor portfolios contained less than 3 stocks while less that 10% of their portfolios contain less than 10 stocks. Other studies document that investors do not react to published accounting information even when it leads sharp movement in stock prices (Bushee & Noe (2000); Gleason & Lee (2003). Therefore, investors who are not able to diversify their portfolios should consider idiosyncratic risk beside systematic risk in projecting expected market return. This paper therefore seeks to establish the effects of EPS on idiosyncratic volatility of stock returns among listed firms in Kenya.

1.2 Problem Statement

Idiosyncratic volatility has always been ignored in asset pricing; this is due to capital asset pricing model's (CAPM) suggestion that idiosyncratic volatility is diversified away since investors hold a proportion of the well diversified market portfolio (Sandberg, 2005). In reality however, this is not always the case. Studies has also found that, for some reasons, investors always do not hold diversified portfolio which usually eliminate significantly idiosyncratic volatility as supported by CAPM (Fazil, 2013), and idiosyncratic risk is priced to compensate investors for their inability to hold the market portfolio (Fu, 2009; Eiling, 2008; Malkiel and Xu, 2006; Fazil, 2013; Boloorforoosh, 2014). With increasing number of empirical studies indicating that financial accounting information affect stock prices volatility (Yu and Huang, 2005; Sharma, 2011; Glezakos, 2012; Sibel, 2013), and with the growth of NSE over the decade, more specificly the growth of active investors, equity turnover and market capitalization; which has led to increased stock price movement and market volatility (Kihara, 2011), there is need to investigate the effect of published financial statement information on idiosyncratic volatility equities price listed at the NSE.

Studied conducted elsewhere have yielded mixed finding, Halonen, Pavlovic and Persson (2013) found that accounting data explains a high portion of stock price movement in Swedish stock market. Abo-Osba (2007) study results showed a statistically significant strong positive correlation between published financial accounting variables and equity prices volatility, Wang and Chang (2008) also noted that there was a positively significant relationship between book value and stock price as well as between EPS and equity price at the Taiwan securities exchange. On the other hand, Hussainey (2011) found a significant and negative relationship between the payout ratio, dividend yield and the firm volatility of stock price at the London equities market. Xing and Zhang (2008) found that there is a negative relationship between EPS and idiosyncratic volatility in the G7 countries. Razaq and Almeri (2014) considered the potential of published accounting data to explain volatility of stock prices at the Amman stock market, the study concluded that the accounting variables explained only 3.8% of the volatility in stock price while 96.2% of the volatility in stock price referred to other reasons. Al-Farah, Almeri and Shanikat (2014) study indicated lack of significant correlation between accounting variables and the volatility with the accounting data explaining only 2.6% of the volatility in the listed equity prices.

These mixed and contradictory results of studies done across different exchanges globally form the research gap and basis of undertaking this study. Therefore, this study sought to establish the effect of EPS on idiosyncratic volatility of stocks return listed at the NSE

1.3 Objective of the Study

To establish the effect of EPS on idiosyncratic volatility of stock returns among listed firms in Kenya.

1.4 Research Hypothesis

H_0: EPS has no significant effect on idiosyncratic volatility of stock returns among listed firms in Kenya.

1.5 Scope of the Study

The study looks at financial statement information which is EPS from firms listed in Nairobi Securities Exchange (NSE). This study took into consideration only the companies that existed and their shares were actively traded at the NSE from the year 1998 to the year 2017. Following the criterion employed by Fu (2009), the researcher zeroed in on the stocks that were traded for a minimum of 15 days during each month of the sample period.

2.1 Literature Review
2.1.1 Theoretical Literature: Signaling Theory

The signaling concept was first studied by Akerlof and Arrow in the context of commodities markets and employment, it was letter advanced by Spence (1973) into signal equilibrium theory, which says, by conveying a credible signal on its quality to the financial markets, a good firm is able to bring out a difference between itself and a bad firm. Ross (1977) indicated how debt obligations could be utilized as a costly signal to bring a difference between a good firm from a bad one. Under the asymmetric information linking investors and

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management, company's signals are important in bringing out financial resources. Ross proposed that, as opposed investors, managers have a clear knowledge of the actual distribution of company returns.

Heinkel (1982), Kraus and Rennan (1984) proposed the costless signaling equilibrium, which states that a signal is costly if the development of the same take up resource or if it is association with welfare loss produced by the departure from distribution of claims in perfect markets. Poitevin (1989) indicated that a firm can use debt as a signal to show the difference between itself and new competition.

According to signaling theory, announcements by listed corporations are hypothesized to contain useful information, for instance, cash dividend announcement is used by management to signal the change in companies future prospect expectation when the markets are not perfect. The financial and companies' investment decisions are made by managers at their own discretion. An increase in shares floated by a listed firm leads to reduction in its share price, shock split courses an increase in equity price, while increase in debt result in price increase actions. However, although dividend declaration is used by management to convey information, the change in dividend my not necessarily be a perfect signal conveyer. According to Easterbrook (1994), increase in dividend payout could be an ambiguous signal unless the participants in the financial market can differentiate between a company that is growing and the one that is disinvesting.

Modigliani and Miller (1961) also proposed that dividend have a signaling effect. The management of a company are more informed regarding the company's performance strategy and can easily forecast its future earnings. Therefore, company employees are more informed that the general market and other investors, this therefore leads to information asymmetry problem. For that reason, dividend can be used by firms a signaling tool to send information to its shareholders and the market as a whole, this information may reflect new approach that the company will adopt in the short, medium and long term. The expectation of investors about the future earning of the company can be changed by the managers, A company has many ways of sending signals to the market. This may include costly strategies that deter smaller companies from emulating the signal, their strategy may include increasing dividend payout.

Signaling theory has progressively become appealing to strategic management research (Bergh and Gibbons, 2011). This is primarily because according (Bergh, 2014), to the theory focusses strongly on the difficulties facing strategic decision makers, this includes how the signal can be employed in reducing uncertainties with exists during a selection process in a situation with incomplete and asymmetrically distributed information.

2.2 Conceptual Framework

The independent variable in this study is Earnings per share, which affect the dependent, Idiosyncratic volatility of listed stocks as shown in Figure 1.
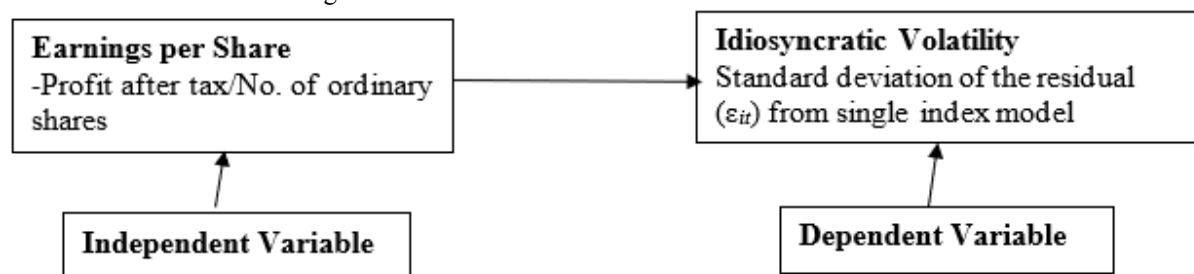

Figure 1: Conceptual Framework

2.3 Empirical Review
2.3.1 Earnings and Idiosyncratic Volatility

Company earnings is one of the important information component utilized by investors in making critical investment decisions, it forms a basis of stake holders decision on whether to invest or divest in a targeted firm, the impact of earnings on equity risk has been investigated from many point of view and various strategies adopted to find out its influence on stock price movement. (Ghosh and Ghosh, 2015) conducted a study on whether corporate accounting disclosures through annual report influence stock price volatility in Dhaka Stock Exchange. The study utilized panel data from 25 privately owned commercial banks for a four-year period starting in 2010 to 2014. The results revealed that book value, return on equity and EPS influenced positively stock price volatility while asset per share and EPS explained jointly highest variation in equity price volatility Mgbame and Ikhatua (2013) found that earnings per share significantly influence stock price volatility at the Nagerian stock market

Wang and Luo (2013) looked at the correlation between accounting data and share price movement in Shanghai securities market, using 60 companies listed at the exchange between 2011 and 2013. The findings indicated existence of a positive relationship linking accounting information and share price, however, return on equity and EPS were the most significantly correlated. After studying the impact of accounting information on

the volatility of stock price Halonen,Pavlovic and Persson (2013) established that a high percentage of stock price movement in the Swedish stock market is as a result of EPS. Piotroski and Roulstone (2004) on the other hand came to a conclusion that market prices depends on supply and demand of the specific holding in the market and certainly not as a result of the profitability of a specific asset.

After examining the impact of EPS on stock prices of the banking sector listed in Amman stock exchange over the years 2001-2005, Abo Osba (2007) found existence of relationship linking equity prices movement and earnings. Almeri, Al-Farah, and Shanikat (2014) on the other hand found no correlation between accounting data and share price volatility. Pastor and Veronesi (2003) indicated that significant uncertainty about a firm's average profitability influences stock return movement, To the extent that financial reporting quality is poor, uncertainty about a firm's future profitability is likely to be high.

Dongwei (2003) analyzed stock price reactions to earnings announcements in the Chinese market, He sampled 183 earnings announcements between 1996 and 1998, using an event study methodology, and he found that the stock price reactions to change in earning per share in the Chinese stock markets. He also found that domestic investors do not correctly anticipate the changes in earnings and fail to adjust new earnings information quickly, but international investors can predict earnings changes better than domestic investors can. As a result, abnormal returns can be obtained by trading on the earnings information for domestic investors only. He explained that most domestic investors are individuals with short-term investment horizon while most foreign investors are large institutions that trade on more detailed and accurate financial information not immediately available to domestic investors.

3.1 Methodology

This study employed correlational and descriptive research design because it is based on the premise that if a statistically significant relationship exists between two variables, then it is possible to predict one variable using the information available on another variable. Target and accessible population for this study comprised of the 39 listed companies that existed and their shares were actively traded at the NSE from 1998 to 2017. In this study, the researcher used census study, a census study is any inquiry of the entire population of a particular set of 'objects', it is a complete enumeration of all items in the population. The researcher collected annual published financial statements for all 39 sampled listed companies for the twenty-year period under study (1998 to 2017). The financial statements were obtained from specific listed company's websites and NSE handbook. A research assistant was engaged to extract the required accounting data (EPS) for all companies in all the financial years under review. The extracted data was input to pre-structured work sheet and then converted into STATA format.

The secondary data encompassed panel data which consists of time series and cross-sections. The panel data obtained was analyzed using descriptive statistics, correlation analysis, and panel regression analysis.

Autocorrelation, heteroscedasticity, and panel unit root tests were conducted to ensure proper specification. The panel methodology was supported by STATA software. Feasible Generalized Least Square estimation was performed after accounting for various violations of classical linear assumptions. The analysis of variance (ANOVA) was checked to reveal the overall model significance.

To estimate idiosyncratic volatility for sampled stocks at the NSE, the researcher employed the standard deviation of the regression residual (ε_{it}) from Single Index Model as outlined in Malkiel and Xu (2003).

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i(R_{m,t} - R_{f,t}) + \varepsilon_{i,t} \ldots\ldots(3.1)$$

Where: i = Specific stock,

R_m = Return on the all ordinaries index

t = Time interval

$R_{i,t} - R_{f,t}$ = Excess return of firm i in month t

$R_{m,t} - R_{f,t}$ = Excess market return in month t

ε_{it} = regression residual.

The specific model used in the study is defined as follows:

$$Yit = \beta_0 + \beta Xit + \varepsilon it \ldots\ldots(3.2)$$

Where;

$Y it$ = Idiosyncratic volatility of firm i at time $t;$

Xit = EPS of firm i at time $t;$

β_0 = the constant term

β_s = The coefficients for the independent variable

Subscript i = Firms (cross-section dimensions) ranging from 1 to 39;

Subscript t = Years (time-series dimensions) ranging from 1998 to 2017;

εit = error term of the model.

4.1 Results and Findings

Table 1 shows the mean, minimum, and maximum values with standard deviation of various variables used in the model for period 1998-2017.

Table 1: Descriptive Statistics

Variables	Obs	Minimum	Mean	Maximum	Std. Deviation
EPS	780	0.005	6.645	63.406	9.515
Idiosyncratic Volatility	780	2.044	26.000	28.890	4.251

Table 1 shows all the variables share the same sample size of 780 observations. The results showed that the mean of EPS was 6.645 with a minimum of 0.005 and a maximum of 63.406. The standard deviation of EPS was 9.515 indicating variability in EPS over time.

4.2 Correlation Analysis

The study conducted correlation analysis for the EPS on Idiosyncratic Volatility in order to examine the nature of the statistical relationships between the variables. Table 2 shows the correlation matrix the variables included in the study.

Table 2: Correlation Matrix Results

Variables	Idiosyncratic Volatility	BVPS
Idiosyncratic Volatility	1.000	
EPS	0.3950** 0.000	BVPS

The results showed that EPS (0.395, 0.000) had a positive and significance relationship with Idiosyncratic Volatility of stock returns among listed firms in Kenya.

4.3 Diagnostics Test

4.3.1 Panel Unit Root Tests

Unit root tests was conducted using the LLC test to establish whether the variables were stationary or non-stationary. The purpose of this is to avoid spurious regression results being obtained by using non-stationary series. Results in Table 3 indicated that the variables are stationary (i.e. absence of unit roots) at 5% level of significance.

Table 3: Unit root

Variable name	Statistic(adjusted)	P-value	Comment
Idiosyncratic Volatility	6.0376	0.010	Stationary
EPS	7.5091	0.000	Stationary

The study therefore concludes that the two variables under consideration do not have unit root and are therefore used in levels. This means that the results obtained are not spurious (Gujarati, 2003

4.3.2 Heteroskedasticity Test

Heteroscedasticity test was performed so as to determine if the error term is correlated across observation in the time series data. The error terms from a regression model must have a constant variance called Homoscedastic and to ensure whether the residuals meet this criterion of the study used the Breusch-Pagan test for Heteroscedasticity where the null hypothesis under this test is that residuals are Homoscedastic. If the p-value is >0.05, there is constant variance. The null hypothesis was therefore not rejected at a critical p value of 0.05 since the reported value was 0.887. Thus, the data did not suffer from statistically significant heteroscedasticity as shown in Table 4.

Table 4: Heteroskedasticity Test Results

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Ho: Constant variance

Variable: fitted values		Idiosyncratic Volatility
chi2(39)	=	59528.65
Prob > chi2	=	0.887

4.3.3 Test for autocorrelation

The study used Wooldridge test in order to detect the existence of autocorrelation in the data, the test assisted the researcher to know whether or not the residual is serially correlated over time and the results are shown in Table 5. The null hypothesis of this test was that there is no first order serial/autocorrelation existed in the data. The test statistic reported is F-test with one and 38 degrees of freedom and a value of 438.94. The P-value of the F-test is 0.260 indicating that the F-test is not statistically significant at 5% level. Hence, the null hypothesis of no autocorrelation is supported and the study concludes that residuals are not auto correlated.

Table 5: Serial Correlation Tests

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation

$F(1, 38) = 438.94$
$Prob > F = 0.260$

4.3.4 Hausman Test

When performing data analysis, it is important to ascertain whether to perform a random effects model or a fixed effects model (Baltagi, 2005). This will assist in making decision on the most suitable model to use, both random and fixed effects estimate coefficients. The researcher used Hausman's specification test (1978) to select between fixed and random effect models. Table 6 shows the results of Hausman test

Table 5: Hausman Test for Idiosyncratic Volatility

	(b) fixed	(B) Random	(b-B) Difference	Sqrt (diag(V_b-V_B)) S.E.
EPS	0.00205	0.00222	-0.00018	0.00029
chi2(4)	0.73			
Prob>chi2	0.941			

The null hypothesis of the Hausman test is that the random effects model is preferred to the fixed effects model. Hausman test reveals a chi-square of 0.73 with a p-value of 0.941 indicating that at 5 percent level, the chi-square value obtained is statistically insignificant. Thus, the researcher did not reject the null hypothesis that random effects model is preferred to fixed effect model for Idiosyncratic Volatility. Therefore, random effects model for Idiosyncratic Volatility was therefore adopted.

4.4 Regression Analysis
4.4.1 Effect of EPS on Idiosyncratic Volatility

Regression analysis was conducted to determine whether there was a significant relationship between. As presented in the Table 4.8, R Square is 0.3133. The model shows that EPS explains 31.33% of the variation in Idiosyncratic Volatility. This means 31.33% of the Idiosyncratic Volatility is influenced by EPS.

Table 4.8: Earnings per Share on Idiosyncratic Volatility

Idiosyncratic Volatility	Coef.	Std. Err.	T	P>|t|	95% Conf.	Interval
EPS	0.001	0.001	2.210	0.027	0.000	0.003
Cons	25.948	0.027	944.64	0.000	25.894	26.002
R-sq:	0.3133					
F(1,779)	4.89					
Prob	0.027					

The fitted model from the result is
$Y = 25.948 + 0.001X$
Where: Y = Idiosyncratic Volatility
          X = EPS

The findings further confirm that the regression model of Idiosyncratic Volatility on EPS index is positive and significant with a coefficient of (r= 0.001, p=0.027) supported by F=4.89. This is also confirmed by the t-statistic value of 2.210 which was greater than the t-critical of 1.96. This shows resistance of positive and significant relationship between EPS and Idiosyncratic Volatility since the coefficient value was positive and the p-values was 0.027 that is less than 0.05. This means that a unitary increase in EPS increases Idiosyncratic Volatility by 0.001units holding other factors constant.

This is consistent with Wang and Chang (2008) who found a positively significant relationship between EPS and stock price movement at the TSE. Shehzad and Ismail (2014) accounting information explains a high percentage of stock price movement while EPS is more value relevant as compared with book values.

4.5 Hypotheses Testing
The hypothesis to be tested was:
H_0: EPS has no significant effect on idiosyncratic volatility of stock returns among listed firms in Kenya
The hypothesis was tested by using multiple linear regression and determined using p-value. The acceptance/rejection criteria was that, if the p value is less than 0.05, we reject the H_{01} but if it is more than 0.05, the Ho_1 is not rejected. The results in Table 4.13 indicate that there was a positive and significant relationship between EPS and IV of listed firms in Kenya (r= 0.002, p=0.012). This was supported by a calculated t-statistic of 2.903 that is larger than the critical t-statistic of 1.96. The null hypothesis was therefore rejected. The study therefore adopted the alternative hypothesis that EPS has a significant effect on Idiosyncratic Volatility of stock returns among listed firms in Kenya.

5.1 Conclusions

Based on the findings, the study concluded that financial statement information represented by EPS significantly influences Idiosyncratic Volatility of stock returns among listed firms in Kenya, more specifically, from the regression analysis results, EPS has a positive and significant effect on Idiosyncratic Volatility of listed firms in the Nairobi securities exchange. The earning per share is therefore a useful determinant of Idiosyncratic Volatility, and when compared with earning per share of other similar companies, it gives a view of the comparative earning power of the companies.

EPS when calculated over a number of years indicates whether the earning power of the company has improved or deteriorated. Growth in EPS is therefore an important measure of management performance and Idiosyncratic risk because it shows how much money the company is making for it's shareholders, not only due to changes in profit, but also after all the effects of issuance of new shares.The study also concludes that published financial statement information, specifically EPS is key in determining firms' specific risk and should be considered by all investors in their investment decision making.

5.2 Recommendations

Security market investors and analyst needs to review their investment strategies and take into consideration EPS in pricing firm specific risk. They need to remain innovative in technology front in order to deliver efficient as well as highly customized asset pricing tools that consider idiosyncratic volatility, this will enable them make a sound investment decision that suit customers investment preference.

Due to the importance of published financial statement information in investment decisions and risk analysis of specific firms at the securities exchange, it is essential that financial information be released to the public and the same be made available in a simplified manner to enable investors including retail investors to make prudent investment decision based on fundamental information.

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