Price to Book Value, Price to Sales Multiples and Stock Price; Evidence from Nigerian Listed Firms

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Abstract – *Valuation of company stock is a significant aspect of investment decision making. Investment analyst's usually value stocks of companies for investors that wants to buy or sell stocks. One of the methods of valuing such is through equity valuation multiples. EVMs are practically used by security and investment analysts to value stock prices. However, little is known on empirical perspective of equity value multiples and stock price especially in emerging markets. This study investigated the influence of price to book value and price to sales multiples and stock price of selected firms in Nigeria. The study utilized data from100 randomly selected listed firms in the Nigerian Stock Exchange. The research covered the period of 2009 to 2013. A random effect estimation model was used to estimate the regression. The result reveals significant positive relationship between, price to book value, price to sales multiples and the stock price. The implication of the positive relationship between the dependent and the independent variables implies that, P/B, and P/S, are significantly and positively associated to stock price. While the implication for low R2 is that, stock prices are not explained only by P/B and P/S multiples but by mixture of several variables. Copyright © 2016 Penerbit Akademia Baru - All rights reserved.*

Keywords: stock price, price to book value multiple, price to sales multiple, Nigerian Stock Exchange

1.0 INTRODUCTION

Equity is a vital source by which a company is financed. Modern companies today are finance by equity, debt or mixture of the two. Equity is generally the remaining value of company security held by equity shareholders after liabilities are deducted. Equity financing played a significant role in the processes of accounting practices. Equities shareholders are sometime regarded as company owners of the corporate entity. This is after settlement of all liability holders. Equities of companies are also called stocks, security investment or shares. In normal circumstances control of a company strategic decision making process is vested on the hands of the shareholders who sometimes delegates such responsibilities to the managers to act on their behalf. The shareholders have the right to vote and be voted for during company meetings. They also have the power to appoint directors for their company and terminate such appointments where they is feel is necessary. The owners of company have power of approving dividends recommended by management and appointment of external auditors to audit the accounts of the company. Therefore, equity shareholders are the backbone of a corporate organization since all strategic decision of the company is vested in their hand.

Valuation multiples On the other hand, are used in expressing the value of all company stakeholders' claims on the cash flow and assets of the business. Accordingly, valuation multiple articulates the value of such right comparative to some indicators that applies to stockholders and other company stakeholders, such as earnings. Valuation multiples are classified into two types- enterprise or entity value multiples and equity value multiples (EVMs) Schreiner [21]. Enterprise multiples are used in express the entire value of the enterprise and all entitlements of the business associated to value drivers that transfers to the entire enterprise, for example company sales. Whereas equity value multiple (EVM) signify the summary techniques, which tell about the market's view of a company's market valuation of stockholders right compared to its challengers Penman [19]. Consequently, valuation of the equities has become a significant part of security decision making for investors, sellers and buyers, security analysts of stocks. Equity valuation multiples (EVMs) are the common techniques used in the valuating stock values [3], [16], [9] and [23]. Security analysts in Nigeria make use of equity value multiples in assessing the performance of company stocks for respective clients and in certain situation investment are determined after computation of company equity valuation multiples. Conversely, literature on equity value multiples (EVMs) and company stock prices are not much and little ones produce mixed results suggesting need for further research [10], [23] and [14].

Similarly, valuation multiples are practically used by investment analysts to assess the performance of company stocks in terms of share appreciation yet little empirical research is conducted on the influence of EVMs on stock returns. Also, most of the works on equity value multiple (EVMs) and stock price are from the advanced markets, little is known in emerging markets Nigeria for example. To the best knowledge of the researchers there is no study on EVMs and stock returns in Nigeria. Therefore, our research intends to fill literature gap by looking at Nigerian listed firms. The research is structured in the following section, the next section discusses the concept of EVMs, relevant literatures and hypotheses, the subsequent section present the methodology and research model. The succeeding section presented discussions and analysis of results. Lastly, the research paper presented concluding remark.

2.0 CONCEPTUALIZATION, PRIOR STUDIES AND HYPOTHESES

2.1.2 Conceptualization of Equity Value Multiple

Equity values multiples (EVMs) are sometime referred to as price or market multiples. They are commonly defined as, the proportion of a market price of equity adjusted to specific value driver (earnings, book value and cash flow example) of a firm. So, EVMs show the summary measures, that tell about the market estimate of a firm market valuation relative to its competitors Penman [19]. Using company price or market value as the numerator distinguishes the EVM from the normal financial accounting ratios (liquidity, profitability, growth ratios,) among others. Some terminologies for example, price to book value (P/BV) and ratio, price to sales (P/S) ratio are usually used in some literatures. For instance, the studies of [3] and [13] . But, this study used more precise terminology in the literature to differentiate the equity value multiples from the common accounting ratios. This study used price to book value (P/BV) multiple and price to sales (P/S) multiple for avoidance misunderstandings [24, [23], [16] and [18]. Equity value multiple provide information on company financial and operating performance at particular time because they are normally determined based on company market value or value driver used to compute the multiples (book value and sales).

2.2 Prior Studies and Hypotheses

2.2.1 Price to Book Value and Stock Returns

Book value of company is an important aspect that provides information on the value of a company. Book values take a prominent roles towards company valuation analysis Ohlson, [17]. The study conducted by Penman [19] reported that, Price to book value (PB) multiple is strongly associated with forecast of future equity value. The work of Aras and Yilmaz [3], also, reveals that, market to book multiple has a significant role towards stock returns forecast of 12 nations during 1997-2003 cross sectional data analysis. The study of Fairfield [9] proposes a model of predicting the influence of price to book value in stock price prediction. The study reveals that price to book value has a positive association with future stock return of sampled firms. The model further submits that various mixtures of variables are related with companies' future profitability. Price to book value multiple can decrease or increase through all equities, producing lower or higher stock returns. Therefore, price to book value multiple plays an important role in forecasting stock returns of firms Foster [11]. There is substantial relationship between price to book value and stock returns of firms listed on the American Stock Exchange and New York Stock Exchange for the 1963 -1990 cross-sectional data Fama and French [10]. Similarly, performance is documented by other equity value multiples yet; P/book value multiple has greatest explanation for future stock returns compared to other equity multiples Antonios, et al [2]. valuation methods that centre on P/B value multiples are more appropriate for firms that experience low return on their shares Burgstahler and Dichev [6] . From practical practices in Denmark, results has shown that, price to book value multiple is higher compared to price to earnings (P/E) multiple, signifying that price to book value (P/B) multiples are the most and superior predictors of valuation Elkjaer et al [8]. Goh [12] studied the accurateness of equity valuation multiples using the four equity value multiples to forecast the accurate stock prices. The research found that price to book value (P/B) multiple represent the most perfect stock price predictor for period. Also, Ittner and Larcker [14] reports that market to book value is positively and significantly associated to markets prediction. However, the research of Shahed et al [23] result from the statistical analysis of four EVMs, the findings suggest no significant changes throughout the sectors. The argument now is on whether price to book value (P/B) multiple can forecast stock return of companies is inconclusive, therefore, we propose the following hypotheses

Ha Price to book value multiple has a significant positive relationship with stock return

2.2.2 Price to Sales and Stock Returns

The research of Barbee, Mukherji and Raines [4], reveals that sales ratio is more dependable in stock return explanation. Price to sales multiple has a positive significant association with companies net profit margin of the listed companies in Amman Stock exchange period Abdel-jalil and Ali [1]. The study of Antonios et al [1] examined the five multiples, the results discloses that, all the multiples estimated the stock value comprehensively enough and their value is significance level submits that averagely the equity value multiples do not misprice the prices of stocks. However the following studies established otherwise, for example, Goh [12] reported that price to sales (P/S) multiple represent the poorest valuation method compared to all other equity valuation method multiples throughout the period of 2003- 2009. The reason may be because of the following, firstly; price to sales (P/S) multiple yields the largest median

of overall error. Secondly, valuation errors of price to sales multiple are maximally spread in inter-quartile sequence and analytically greater compared to its pairs. Also, the study of Elkjaer et al [8] reported that, it's not wise for investor to use price to sales (P/S) multiple for companies with differences in financial leverage. This because the revenues from sales flow are usually for all stakeholders of company capital not only stockholders. Thus, enterprise/entity values to sales (EV/S) multiples offer more wisdom from the theoretic perspective. Lastly, Stauropoulos et al [1], study reveals that price to sales multiples (P/S) if measured independently has no average substantial value in predicting average prices of stock. This is because the mean and median values of the multiple express systematically undervalued the value of stock, as a result of the fact that mean share price is greater than the intrinsic value of mean. Thus, the variance between the means of stock price and the essential value of it is not important statistically. As a result of conflicting findings on whether price to sales multiple can predict stock returns, our study developed the following hypothesis.

Ha Price to sales multiple has a significant positive relationship with stock return

3.0 METHODOLOGY

The research used secondary data of the published financial reports of the selected listed Nigerian firms. The data are collected from Nigerian Stock Exchange Facts book and individual account of the companies for the period of five (5) years (2009, 2010, 2011, 2012 and 2013). The period of the study is selected for the two reasons. Firstly, is period after global financial crises which have affected almost most world countries, Nigeria inclusive. Secondly, is considered as the period of loss of huge sum of money by both local and international investor's due to drastic drop in value of stock. The study population consists of public firms listed on the Nigerian Stock Exchange (NSE) and 100 firms are drawn as sample based on the availability of data. The research utilized Random effect model in estimating the regression after the Pool ordinary least square (OLS) failed to satisfy the basic post estimation tests.

Table 1: Variable definition for equity value multiples construct

EVM Variables	Measurements
Price to book value (P/B)	Price per share divided by book value per share for the sampled companies over the period
Price to sales (P/S)	Price per share divided by gross revenue/sales per share for the sampled companies over the period
Stock price (S/P)	Company stock price

3.2 Variable Definition and Measurement

Model Specification and Variables Definition

$$SP_{it} = \beta_0 + \beta PB_{it} + \beta PS_{it} + \varepsilon_{it}$$

Where:

SP represent stock prices for every firm over time,

β_0 = constant,

β = independent variable parameter,

PB= price to book value multiple

PS= price to sales multiple

it = denotes combination of cross sectional data and time series sample firms and

ε = error term to take care of variables that are not captured in our regression model

4.0 RESULTS AND DISCUSSIONS

This research investigated empirically the influence of price to book value and price to sales multiples on stock return of firms listed on the Nigerian Stock Exchange. The results for the descriptive statistic, correlation matrix and multiple regressions are presented below.

Table 2: Descriptive Statistics

Variable	Mean	Std.Dev.	Min	Max
SP	4.63084	15.63062	-24.21	232.24
P/B	2.4286	4.260689	-16.72	33.21
P/S	1.57568	2.261966	.01	21.78
SIZE	7.278	.8806313	5.71	9.59
IND.	.04	.1961554	0	1

Table 2 presented the mean (average) for the dependent and the independent variables, their minimum and maximum values and the values standard deviation (SD) statistics (normality test). The result in the table shows that, Price to book value has the maximum mean of 4.63084 and price to sales has a mean value of 2.4286. The minimum and maximum values for price to book value are -24.21 and 232.24 respectively indicating that our explanations are within those values. While, price to sales has a minimum value of -16.72 and a maximum value of 33.21

suggesting the interpretation with price to book value. The other part of the descriptive statistics results is standard deviation (degree of dispersion) for the variables. The SD for price to book value multiple is 15.63062 and that of price to sales multiple is 4.260689. On the total, the level of dispersion from the mean is little high in price to book value, however not much. These suggest close clustering of the data around the mean implying its reliability. The next subsection presents the correlation matrix result.

Table 3: Correlation Matrix Results

Variable	SP	PB	PS	SIZE	IND.
SP	1.0000				
P/B	0.3573	1.0000			
P/S	0.4391	-0.3582	1.0000		
SIZE	-0.0157	-0.0378	-0.0914	1.0000	
IND.	0.1015	-0.0838	0.1003	-0.1055	1.0000

In table 3 of the research presented and discusses the association (correlation matrix) between company stock prices, price-book value, price to sales multiples, firm size and industry. The reason of introducing size and industry is to control for possible spurious result. The result obtained shows that price to sales has the highest positive correlation of 0.44 with stock price while price to book value has positive correlation of 0.34 with stock price. Size has the highest negative correlation of 0.02 with stock price. After crosschecking the correlation matrix above, the table revealed that, dependent variables have no perfect correlation with stock price of the sampled firms since all the variables have correlation of less than 50%. The implication is that, our model has no problem of multicolinearity. Multicolinearity problem between the explained and the explanatory variables results to erroneous signs or improbable magnitudes in the model making coefficients estimation and the standard errors to be bias. The subsequent subsection presents the multiple regression results.

To investigate the relationship that exist between the explained variable (stock price) and explanatory variables (price to book value and price to sales multiples), the generally used panel data regression models (pool OLS, random effect and fixed effect models) are used. Table above presented only appropriate estimation result and differences in the determination coefficient (R-squared), signs, and their insignificant levels. The OLS was first estimated however, after the post estimation test, OLS result failed to satisfy the standard assumption. Therefore we estimated random and fixed panel regression models. In selecting between random and fixed models, Hausman test was cay out and the result suggests that we report random effect model and reject fixed effect model. However, in order to ensure the appropriateness of the random effect model, Lagrange Multiplier (LM) test by Breusch and Pagan [5] (to choose between random effect models and pool OLS). The results justify the appropriateness of the random effect regression model. The random effect model result shows an R-squared of 0.24. This means that 24% of the deviation in the dependent variable (stock price) is explained by price to book value and price to sales multiples. The inference is that, only 20% variation in the stock price is explained by P/B and P/S multiples and the remaining 80% of the variation are explained by variable not captured in the model. The low R square is rational as numerous other factors could influence stock price. Gross domestic product foreign

exchange rate, lending interest rate, earnings influences stock price [7]. The probability of price to book value and price to sales is positive and significant statistically at 1% in explaining stock price. The implication is that, there is 99% confidence level that P/B and P/S multiples can predict stock price of Nigerian listed firms.

The price to book value multiple as presented in table 4 has a coefficient of 0.82 positive suggesting that increase in one unit of price to book value stock price will lead to corresponding increase is stock price by 0.82 Nigerian Naira (NGN). The individual probability value for price to book value multiple is positive and statistically significant at 1% level signifying that increase in price to book value multiple leads to increase in firm stock price. The results further submits that price to book value multiple can individually model stock price. In addition, the result suggests that our alternate hypothesis (Ha) which predicts a significant positive relationship between price to book value multiple and stock price is supported. The result supported studies of [12] and [14] that price to book value multiple is important predictor of stock. However, contradicts of [23].

Table 4: Regression Results

Variable	Coeff	T-value	Probability
PB	0.8233323	5.33***	0.000
PS	2.472243	8.44***	0.000
SIZE	-0.6165477	-0.87	0.385
IND.	3.452073	1.09	0.275
Cons	3.0722611	0.59	0.556
R square	0.2421		
Prob Chi	0.0000		

Note: *** significant at 1% level of significance

Furthermore, table 4 reveals that price to sales multiple has a coefficient of 2.47 also signifying a one unit increase in P/S multiple makes stock prices to increase by 2.47 Nigerian Naira (NGN). The of probability P/S is positive and significant at 1% confidence level denoting that our alternate hypothesis guessing significant positive relationship between price to sales multiple and stock price is supported. The result supported findings of Stauropoulos et al [2], who established all equity multiples appraised the stock value sound enough. However, disputes the study of [12] and [8] that, P/S multiple is the poorest method among all the equity value multiples.

5.0 CONCLUSION

The discussion presented above has shown that price to book value and price to sales multiples are positively and significantly associated to stock price of Nigerian listed firms. A part from collective ability of explanatory variables to influence or predict stock price, individually both P/B and P/S value multiples can predict stock price. The implication for the result is that, various classes of investors (value and growth) can use price to book value and price to sales multiples to appraise stock and possible future price increase. Therefore, the study conclude

that combination of P/B and P/S equity value multiples have important effect in predicting stock price due the positive nature of their combine and individual relationship. The research therefore, recommends that investment analyst's sellers and buyers of stock to calculate company equity value multiple in order to make good investment decision. However, in using price to book value and price to sales value multiples to make investment decision, computation of individual equity value multiple is greatly recommended to determine individual and collective influence of the equity value multiples and stock price prediction. The study also recommends further research that will include more data, inclusion of other equity value multiples and possibility of looking at before and global financial crises for comparison of multiples before the crises and the aftermath.

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