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EFFECT OF FIRM SIZE ON EXPECTED RETURNS OF LISTED COMPANIES IN NIGERIA CAPITAL MARKET

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Abstract

Over the years, Nigeria capital market has experienced persistent decrease in performance. Investment decision is one of the key corporate decisions that affect firm financial performance. This study investigated the effect of firm size on expected returns of listed companies in Nigeria. The population of the study is all the listed companies in Nigeria. Adjusted population of 103 companies was used for data analysis. The period of the study is between 2010 and 2018. Monthly stock data were extracted from Bloomberg. Cross sectional regression and z-test technique were used as technique for data analysis. The outcome from the regression revealed that firm size has positive significant relationship with expected returns. The z-test analysis revealed that larger size firms have higher return than smaller size firms. The outcome was consistent with product life cycle theory. It was recommended that companies increase firm size by adopting profit maximization policy and issuing more equity.

Key words: Expected returns, firm size, Nigeria capital market.

1. Introduction

The overriding objective of companies is maximization of shareholders wealth. Companies exist to compensate the investment of their owners. The metric that indicates improvement in shareholders wealth in the capital market is share prices or share returns. A rise in share prices indicates that the performance of the company is growing. In contrast, a decline in share prices is an indicator that the performance of the company is in decline. Hence, share prices or returns are indicators that capture both financial and non-financial events affecting companies' activities. Consequently, the Nigerian capital market as a whole has been experiencing decline in performance since 2011 despite increase in volume of trades conducted in the capital market. The Nigerian All Share Index reached a low of 19785.03 basis point in 2011. In comparison to world market capitalization to Gross Domestic Product, the capital market is ranked 55th out of 61 countries' capital market (Bloomberg, 2018).

Consequently, corporate finance theory argued that the reason for rise or decline in corporate performance can be attributed to companies' capital structure decisions, dividend policy, and investment decision. The decision considered for this study is investment decision. Firm size is pertinent to investment decision because economies of scale theory argued that larger firms tend to benefit from cost minimization due to increase in marginal productivity. As production volumes increases, cost of production reduces for larger size firms. The reduced cost of reductions, increases profit margin, thus improving firms expected returns. In contrast, small size firms encounter increase cost of production, which sometimes are due to fixed cost incurred. Also, larger size firms benefit from easy access to debt financing as their assets can be used as collateral, therefore, enabling them to pursue long term investment opportunities, which increases firm value (Frank &Goyal, 2014).

Given the deterioration in the market performance, this study seeks to examine the effect of firm size on expected returns of all the listed companies in Nigeria capital market. Previous empirical studies conducted in the Nigeria capital market such as Akwe and Garba (2019), Ayuba et al. (2018), Ibrahim and Bala (2017), Eze (2019) attempted to explain the relationship but encountered two major limitations; industrial focus of their analysis that prevents generalization of findings on the entire capital market, and the use of Nigeria All Share index as proxy for stock expected returns. The implication of using the Nigeria All Share index as proxy for stock expected returns is that capital asset pricing model and modified asset pricing model have unanimously argued that indices such as the Nigeria All Share index and Standard and Poor index are proxies for market returns representing market portfolio that determines stock returns (Sharpe, 1964). Hence, the indices are the determining proxies not the proxy for stock expected returns. Therefore, Eze (2019) studies cannot serve as a generalized analysis for stock expected return determinant.

Also, while previous studies looked at the effect of firm size through regression analysis, this study would also consider Z-technique for analysis. Stocks returns in the Z-technique are separated using median approach between large size firms and small size firms.

Therefore, the specific objective of the study is to examine the effect of firm size on expected returns of listed companies in Nigeria. The hypothesis raised in respect to the study is presented in both null and alternate and form, as well using the language of hypothesis.

$$H_0: \mu(\bar{R}_j^{LAS}) \leq \mu(\bar{R}_k^{SAS})$$

H₀: The mean average stock returns of large size firms is lesser than or equal to the mean average stock returns of small size firms.

$$H_1: \mu(\bar{R}_j^{LAS}) > \mu(\bar{R}_k^{SAS})$$

H₁: The mean average stock returns of large size firms is greater than the mean average stock returns of small size firms.

Where: \bar{R}_j^{SAS} is the average monthly returns of small size companies within the period of studies , \bar{R}_k^{LAS} is the average monthly returns of large size companies within the period of the study, $\mu(\bar{R}_j^{SAS})$ is the average of average monthly returns of small size companies , and $\mu(\bar{R}_k^{LAS})$ is the average of average monthly returns of large size companies within the period of study.

2. Review of related literature

This section provides conceptualisation of expected return, critical empirical review of the related study and theory used to underpin the work.

The term expected return has no universally accepted definition in literature. Definitions often revert to proxies. Return arises due to investment. It constitutes dividend yield and capital gain. It can be expressed in an expectation form or realized form. Realised return is a form of return that has been realized and can be computed using historical prices. Literature use realized returns as proxies in measuring expected returns as expected returns are empirically unobservable (Elliot, 1978). Hence, this study measures realized return as the expected return. Expected return is a return that has not been realized, and could be obtain through modular predictions. The term expected return emanates from Muthian rational expectation theory. According to Muth (1961), expectation is when predictions are in line with current information and the underlying theory. The expectation becomes rational when it efficiently utilizes the available information. Efficiency in the utilization of the information is normally equated to unconditional predictive accuracy. Hence, the most preferable expectational estimate is the one that utilizes the available information more efficiently and provides the most accurate unconditional predictions. In order to distinguish between mere pronouncement about what firms ought to do and expectation in economic and capital market theory, Muth (1961) added the word ‘rational’ to expectation. Since then economic models about expectation incorporates rationality in the assumptions of a model.

Consequently, expectational estimates about stock return took a modular approach. Elliot (1978) argued that at the aggregate level, future value of equity is an expectation that is expressed as the summation of expectation of all prices of equity with the expectation of dividend payments on the equity securities and expectation of the reinvestment rate. The expectation of the average return of equity is the future value of equity securities divided by current price of equity. The assumption behind Elliot (1978) model is that investors expects dividend to grow indefinitely and at a constant rate. Also, future reinvestment rate is the same as long term expected return. The simplification of the assumption is that dividend changes results in share price changes. Elliot (1978) also argued that expected return can be considered the required return for investment.

Martin and Wagner (2019) expressed expected return of a security in terms of risk-neutral variance of the individual stock, risk-neutral variance of the market, and the value-weighted average stocks’ risk-neutral variances. The risk-neutral variances are extracted from real time option prices, making it a forward looking approach. The risk-neutral variances of the market directly measures equity premium as it provides a lower bound to the equity premium. The underlying asset in risk-neutral does not pay dividend and increases in the time to maturity. Literatures conducted through option based model include: Bakashi et al. (2003), Conrad, et al.(2013), Martin (2017), Kadan and Tang (2018), and Martin and Wagner (2019).

Capital Asset Pricing Model approach to expected return of stock is expressed in terms of market portfolio, risk free rate, and the contribution of individual security to the market portfolio risk, represented by beta. However, this study adopted realized return as proxy for expected return due to the in ability to practically observe expected return.

Over the years, the concept of firm size has been defined differently by numerous scholars. This is why Ball and Foster (1982) argue the definition of firm size theoretically and empirically revert to proxies. Bujaki and Richardson (1997) define firm size as the number of employees in company. Treguiros (2000) views firm size as the total asset, sales or market capitalisation of a company. Beck et al. (2008) see firm size as the total revenue or total sales of a business. For the purpose of this study Fama and French (2015) market capitalisation definition was adopted as firm size. This is because market capitalization reflects current market value of companies as opposed to total asset, which is a representative of book value extracted from historical data.

Market capitalization as defined by Fama and French (2015) is the total market value of a company. It is estimated by multiplying a company's total outstanding shares with its market value. Firm size is considered for this study because it reveals riskiness of a firm. Scholarly articles like Fama and French (2015), affirmed that smaller firms tend to be riskier than larger firms, thus the former have higher returns than the latter. The reason being, smaller firms tend to have few assets to offer as collateral, and have more investment opportunities as opposed to large firms with huge asset for collateral, and less investment opportunities. However, other scholars like Frank and Goyal (2014) argued that large size firms have higher risk than small size firms because of their easy access to debt, which increases their risk.

Empirical studies on firm size and stock returns are generally of two outcome and implications; positive significant outcome that implies that the larger the firm size, the higher the expected returns, and the negative significant outcome that implies that smaller the firm size, the lower the expected returns. Furthermore, the reviewed literatures below are mostly based on accounting-based measures due to unavailability of studies related to marketbased measures. However, Fama and French (2015) argued that accounting-based measures provide intrinsic basis for market-based valuation.

2.1 Firm size and expected returns

Alabdullah et al. (2018) examined the effect of both firm size and board size on financial performance of listed industrial firms on Jordanian stock exchange market using a cross sectional data of 2013 and multiple regression technique. Firm size was measured using the log of total assets, while financial performance was measured using return on asset and return on equity. The study found positive insignificant relationship between firm size and return on asset as well as firm size and return on equity. The regression outcome suggested that firm size is irrelevant to financial performance of listed Jordanian industrial firms. However, the study made use of a cross sectional data for the period (2013) that is far away from the publishing period (2018) without sufficient justifications. Also, the study did not go further to elaborate on the irrelevant regression outcome of firm size and financial performance.

Yuliarti and Diyani (2018) examined the effect of firm size on stock returns of listed pharmaceutical companies on Indonesia stock exchange market between 2011 and 2016 using multiple linear regression model. Firm size was measured using total asset, and stock return was measured using log of share prices. The finding from the study was negative insignificant relationship between firm size and stock return. However, the study does not provide theoretical analysis for the negative insignificant result. Also, given that firm size is less volatile than stock

return, that is they change annually as opposed to stock return that change daily, this might have impact on the regressed outcome.

Astuti et al. (2019) investigated the impact of firm size on firm value mediating with corporate social responsibility on Indonesia stock exchange market from 2012 to 2016. Multiple linear regression analysis methods and path analysis as well as Sobel test were used for the study. Purposive sampling technique was used. Firm value was measured using Tobin's Q and firm size was measured using total asset. Corporate social responsibility was measured using a dummy of 1 and 0. The result from the regression was that firm size has positive significant relationship with firm value when mediated with corporate social responsibility disclosure. However, the study made use of a subjective sampling technique that is the purposive sampling method. Also, using dummy for corporate social responsibility disclosure could result in dummy trap given that the other variables in the study are continuous variables.

Oyelade (2019) examined the impact of size on financial performance of listed firms in the building industry in Nigeria from 2004 to 2017 using panel regression analysis. The proxies for financial performance were return on asset, return on equity, output per labour and output per capital. Output per labour and output per capital were measures of performance in respect to productivity. The proxies for firm size were total assets, total sales, and number of employees and age of firm since incorporation. Total sales was positive and significantly influences return on asset, meaning that the higher the sales the higher the financial performance. Age of the firms were significantly negatively related to performance, meaning that the more the age the lower the performance, this is true given that product have life cycles and older firms tend to be at the decline of their life cycles. As for other measure of size, none were significantly related to return on asset, and all the variables were not significantly related with return on equity. Also, total sales, age, and number of employees were positively related to output per capital and output per labour. However, there is insignificant result in firm size variables and return on equity. Such insignificant results cast skepticism of the variable measurement, given the proximity between return on asset and return on equity.

Habibuet al. (2019) examined the effect of firm size on firm value of 27 listed insurance companies in Nigeria from 2011 to 2017 using longitudinal panel regression analysis. Firm size was measured using total asset whilst firm value was measured using Tobin's Q. The finding from the study revealed positive significant relationship between firm size and firm value. Thus, the larger the size, the larger firm value. Criticism of the study is that there could inter relationship between firm size and Tobin's Q given that the denomination for Tobin's Q represents total asset. Unless if other measurement of firm size like number of employees or total sales is adopted.

Vu et al. (2019) examined firm size, wage, age, international trade, and competition as determinants of firm performance of listed Vietnamese firms using cross sectional data of 2015. Firm size was measured using total number of employees, whilst financial performance was measured using return on asset, return on equity and net income per employee. Ordinary least square method and quantile regression method were used for analysis. The regression result for both ordinary least square and quantile regression revealed positive relationship between firm size and financial performance. Criticism of the study is that, the study outcome may not be

relevant given the frequent changes in firm attributes as the period considered (2015) is distanced from the period of publication (2019).

Hirdinis (2019) investigated the impact of capital structure and financial value moderated by profitability on listed mining companies of Indonesian stock exchange market. The study was conducted between 2011 and 2015 using purposive sampling technique and causal comparative methodology. The result from the study revealed that firm size has positive significant relationship with firm value, meaning the higher the size of a firm, the higher its firm value. However, when mediated by profitability, the relationship is insignificant. However, the study made use of purposive sampling technique, which is a highly subjective sampling technique. Also, the sample size is very small (7), compared to the overall population (47). Furthermore, the study aimed to use moderation analysis; however, it made use of mediation analysis.

Fathinah and Setiawan (2020) examined the effect of firm size on financial performance of seven listed consumer goods companies on Indonesian stock exchange market from 2013 to 2019 using panel regression analysis. Total asset was used as a proxy for firm size, whilst share prices were used as proxy for financial performance. The study made use of purposive sampling technique. The data used were quarterly data. The result from the study revealed positive significant relationship between firm size and financial performance, meaning that as companies asset grow, their financial performance increases. However, the study made use of purposive sampling technique, which is very subjective sampling technique. Also, the sample size for the study is not sufficient as seven out fifty-five listed companies in the industry were only selected.

The theoretical explanation for this study is product life cycle model theory, which represents the relationship between a product life and sales. The theory categorized the life of a product into broadly four phases. Introduction stage, growth stage, maturity stage and decline stage. At introduction stage products usually experience high cash out flow and low profitability. At growth stage the product will be highly profitable, and would have high cash inflow. At maturity stage, the cash inflow peaks, profit peaks and more market share. At maturity, the profit declines and cost per unit increases (Mercer, 1993). The relationship between the product life cycle theory and size is that at the growth stage and maturity stage, companies usually have large market share, and at the introduction stage, companies usually have small market share. Consequently, in finance, market share is represented by market capitalization, which is the proxy for firm size used in this study.

3. Methodology and Models

This section provided information about the population of the study, source and method of data collection, tools and techniques for data analysis, and model specification and measurement. The population of the study is all the 177 listed companies in Nigeria. The study used filter to arrive at the adjusted population of 103 companies. The basis for caveat is that: companies have to be listed and not delisted between 2010 and 2018. Share prices of the companies have to be available within the period. The period of study is from December, 2010 to January, 2018. This is because the period reflects the decline in the Nigeria stock exchange stocks.

Furthermore, companies were grouped into large size firms and small size firms. The procedure for the grouping was as follow; firm size as at December 2010 was added to firm size as at

January 2018, the sum was then divided by two to arrive at the average firm size of the companies. This approach was used by Sharifzadeh (2006) despite limitation of seasonal variation and techniques in obtaining average for time series data often have limitations in dealing with seasonal variations (Bell & Hillmer, 1984). The firm size of all the companies were arranged in ascending order, and the median average was obtained. Companies that fall below the median are categorized as small size companies, while companies that are above the median were categorized as large size companies. The reason for the approach is to investigate effect of the variables on the returns as raised in the hypothesis statement.

The study made use of secondary data extracted from Bloomberg terminal. Share prices and firm size were extracted from the Bloomberg terminal. Bloomberg terminal is a financial data base that provides financial information to investors. It provides access to real time and historical financial information (Bloomberg, 2018). Bloomberg terminal was used because monthly share prices cannot be extracted from annual report. Cross sectional regression and Z-test technique were used to analyse the data collected. Cross section was used due to the fact that the variables constitute cross section of companies and no time series. Z-test technique was used to see differences in return of small size firms and large size firms.

Table1: Variable definitions and Measurement

Variable name	Type	Measurement	Source
Monthly stock return (R_{jt})	Dependent	$R_{jt} = \frac{(P_{jt} + D_{jt}) - P_{j(t-1)}}{P_{j(t-1)}}$ <p>where P_{jt} and $P_{j(t-1)}$ are company prices at months t and $t-1$ respectively and D_{jt} is the dividend per share paid by company j to its common stockholders during the month t. Adjusted closing prices was used to account for dividend effect</p>	(Elliot, 1978)
Firm size (s)	Independent	Price * Total number of outstanding shares=market capitalization	Fama and French (2015)

The model took the following form:

$$SRT_{it} = \beta_0 + \beta_1 FS_{it} + \epsilon_{it}$$

Where,

SRT_{it} represents stock returns, β_0 being the Constant and β_1 is the coefficient for firm size, and ϵ_{it} captures the stochastic disturbance (the error term).

4. Results and Discussion

This section provides a detailed discussion on the descriptive results, diagnostic test conducted, and regression run. Interpretations of results and hypotheses tests were explained. Contrast and comparison of results with existing literature stance was provided under the section. Finally, the economic value of the findings was revealed under recommendation of the study.

Table 2: Descriptive Statistics

Variable	Observation	Mean	Standard deviation	Minimum	Maximum	Skewness	Kurtosis
Stock returns	103	0.38%	1.5%	-3.2%	4.6%	0.1099	0.1510

Firm size	103	107896.3	410033.8	198.82	3629458	0.0000	0.0000
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Source: STATA, (2021)

The above table 2 provides information that describes the data collected. The total number of observations is 103. The number of observations reflects the adjusted population of 103 listed companies in the Nigerian capital market. The average expected returns of the listed stock are 0.38%. The minimum expected return amongst the stocks has an expected return of -3.2%. The stock that represents the figure is MORISON NL Equity. Stock with the maximum expected return has a return of 4.6%. The stock that represents the figure is FORTISMF NL Equity. The standard deviation for expected return is 1.5%. The figure of the standard deviation is not far away from the mean, hence, signalling normality of the variable distribution. Similarly, the level of skewness and kurtosis are below 0 and 1 respectively. The rule of thumb is that for variable to be normally distributed, the skewness level should not exceed 0 and 1 respectively (Jammalamadaka, Taufer, & Terdik, 2021). This further reinforces normality assumption of the expected return variable.

Furthermore, the table 2 revealed that the average firm size is N107896.3million. This is an indicator that stocks in the Nigeria capital market have a market capitalization of N107896.3million. The minimum value of N198.82million is an indicator of the smallest size stock, which is TRANSEXP NL Equity. The maximum value of N3,629,458 million is an indicator of the largest size stock, which is DANGCEM NL Equity. The standard deviation of 410033.8 is value not far away from the mean of N107896.3, which is an indicator that the data is normally distributed. The skewness 0.0000 and kurtosis 0.0000 further reinforces the assumption of the normality of the variable distribution. The normality suggests that the data are not skewed towards a particular direction, and the absence of outliers in the variable distribution.

Table 3: Summary of regression result

Stock returns (SRT)	Coefficients	Standard Error	T- Value	Sig. Level
	β			
F Statistics	0.09			
Adjusted R-squared	0.03			
Regression result				
Firm size (fs)	6.14	3.59	1.71	0.090

Source: Stata (2021)

The above table 4.2 provides information related to cross sectional regression conducted for the study. The F-statistics is statistically significant at 10% level of significance. The significance of the F-statistics demonstrates that the model is fit to conduct analysis, and the independent variable is properly selected. The adjusted R-squared of 3% revealed that 3% variation of stock return is due to firm size, whilst 97% is due to variables not captured in the model.

In respect to the regression coefficient, the coefficient of 6.14 and the p-value of 0.09 suggest that there is positive and significant relationship between firm size and expected returns. It implies a unit increase in market capitalisation would result to an increase expected returns by

6.14%. The implication of the finding is that increase in firm size results in increase in profitability because of economies of scales derived from firm operations. Also, the increased size allows for diversification that reduces uncertainties surrounding future cash flow. A reduction in uncertainty in future cash flow leads to decline in cost of capital, thus, resulting in increase in firm value. In addition to that, size eases access to financing that provides competitive advantage to finance investment opportunities. Moreover, the finding is in line product life cycle theory that argued as firms grow from introduction to maturity, their profitability increases to due to reduced operating cost. Similarly, the finding is in line with the following empirical studies that obtained positive significant relationship between firm size and financial performance.

Table 4: Results of the Z Test for Comparing Small and Large Companies' Average Returns
z-Test: Two Sample for Means

	<i>Small size companies</i>	<i>Large size companies</i>
Mean	0.00	0.010092882
Known Variance	0.00	0.000217
Observations	52.00	52
Hypothesized Mean Difference	0.00	
Z	-4.74	
P(Z<=z) one-tail	0.00	
z Critical one-tail	1.64	
P(Z<=z) two-tail	0.000	
z Critical two-tail	1.96	

Source: Excel (2021)

The Z-test table revealed that large size companies have an average return of 0.01, whereas small size companies have an average return of 0.00. The difference in the averages is not by chance as p-value for two tail hypotheses is statistically significant at 1% level of significance. This implies that the larger the size of a company, the larger the company's return. Likewise, the smaller the size of a company, the smaller it returns. Thus, size influences variation of stock returns. For hypothesis testing, the significance of the z-statistics implies that the null hypothesis is rejected and the alternate hypothesis that larger size firms have higher returns than smaller size firms is accepted. The outcome from the z-test further supports the regression outcome of the positive effect of size on expected returns.

5. Conclusion and Recommendation

The study investigated the effect of firm size on expected returns of companies in Nigeria capital market. Regression analysis and z-test technique were used for the analysis of firm size and expected returns. The findings from the regression result revealed that firm size has positive significant relationship with expected returns. Similarly, the z-test analysis revealed that larger firm size has higher returns than smaller size firms. The finding is supported by the product life cycle theory. Owing to the above findings, the study recommends that listed companies in Nigeria should increase their firm size through issuance of equity and appreciation of trades

share prices. Share prices can improve if there is increase in profitability. Increase in profitability can be achieved if cost minimization policy like just in time system and revenue maximization policy like product or market development are implemented. Consequently, the increase in share price would attract more investors to subscribe with the profitable companies.

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