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EFFECT OF FIRM CHARACTERISTICS ON THE PROFITABILITY OF MEDIUM-SIZED COMPANIES IN SOUTH EAST NIGERIA

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Abstract

This study examined the effect of firm characteristics proxied by firm size and firm age on the profitability, proxied by Return on Assets (ROA) of twenty-nine (29) medium-sized companies in South East Nigeria. The South East Nigeria which should be the hub of industrial output majorly because of the generally held view that people of that part of Nigeria are very enterprising, is still backward as shown by the several indices of decline of the manufacturing sector to Nigeria's GDP. Multiple regression was used for this analysis. It was found that firm size has positive and but not significant influence on financial performance (ROA) of firms, that is, the greater the size of a firm, the better the reported ROA. It was also found that firm age negatively affects profitability. It is therefore recommended that the sampled firms should invest only in clearly new profitable businesses because the result showed that as they grow older, the returns reduce. It is also recommended that the medium-sized manufacturing firms in South-East Nigeria should invest more in expanding the size of their operations in order to maintain the right level of profitability since the study have found out that firm size positively influences ROA.

Keywords: Firm Size; Firm Age; ROA; Characteristics; South East

Introduction

The firm's ability to remain profitable is the major precondition for survival and expansion. It has long been observed that companies operating in the same environment show different results. Since the main objective of a typical company is to maximize profits and thereby, shareholders' wealth, efforts of researchers have been to identify the factors or characteristics that engender profitability and what can hamper such profitability. What is needed at this time is to put the critical characteristics together to see their collective effects on a firm's performance.

Although external factors outside the firm's characteristics can and do affect outcomes, the fact that

some firms are doing well and others are not, points to firm-specific factors as the reason why the results differ very widely, especially in Nigeria. This is why despite the cries of companies about the operating (external) environments; researchers ought to be more interested in the characteristics rather than recommending palliatives from government as the only way out of poor performances of firms.

Despite the important role of the manufacturing sector in development, Nigeria, especially the South East which should be the hub of industrial output majorly because of the generally held view that people of that part of Nigeria are very enterprising, is still backward as shown by the several indices of decline of the manufacturing sector to the GDP. However, while a few manufacturing

companies such as Innoson Motors and Risopalm Industries Ltd are in production as at 2020, many of them such as OnwukaInterbiz (that was producing shock absorbers for Peugeot Automobiles Nigeria Ltd) have totally closed down. Giants such as Curtix Cables Ltd. are merely surviving. Most works in this area are foreign or outside the NE Nigeria, thus their findings will have disparities in nature of their economic systems and their market structure.

The specific objectives of this seminar are to:

- i. Assess the effect of firm size on profitability of medium-sized manufacturing companies in South-East Nigeria
- ii. Examine the effect of firm age on profitability of medium-sized manufacturing companies in South-East Nigeria.

This research was conducted using some of the medium-sized manufacturing companies in South- East Nigeria between 2014 and 2018, a period in respect of which data was available for analysis in 2020. We are interested in medium-sized companies for reasons of their better contribution to the GDP of Nigeria, and their bigger employment of workers, than small companies.

Profitability. Profitability in this study is proxied by Return on Assets (ROA).

Medium-sized Manufacturing Firms

Medium Enterprises of which manufacturing firms are a sub-set, is defined by Small and Medium Enterprises Development Agency (SMEDAN) (2007), as having between 50 -199 employees, and N50,000,000 to N500,000,000 (excluding land and buildings). This guided the selection of the companies operating in south-eastern Nigeria that are included in this study.

Firm Age. Firm Age is defined as the difference between the year of incorporation and the base year of our research, i.e. 2014, in figures.

Firm Size: Firm size in this study refers to the value of the firm, especially the visible bottom-line, its balance

sheet value, and its spread in terms of employees and assets.

Review of Relevant Conceptual Literature

Concept of Firm Characteristics

According to Kogan and Tian, (2012), firm characteristics include firm size, leverage, liquidity, sales growth, asset growth and turnover. Others include ownership structure, board characteristics, age of the firm, dividend pay-out, profitability, access to capital markets and growth opportunities (Egbunike & Okerekeoti, 2018). Of all the characteristics, firm age and size are considered as the most critical in rank as they affect other characteristics. We also rely on the statements to that effect in the works of Ali, Mohammed and Amer, (2015) in Saudi Arabia; Chandrapala and Knapkova, (2013) and Kaguri, (2013) in United Kingdom, and Kenya respectively.

Firm Size: Firm size as an internal factor of a company has been considered a very important attribute of profitability, obviously because the size of a firm determines its level of economic activities and possible economies of scale enjoyed by the firm. This promotes efficiency. Therefore, Firm Size has become dominant in empirical corporate finance studies and has been widely established among the most significant variables (Kioko, 2013).

According to Alena and Eva (2012), firm size is measured by the average number of employees while considering the determinants of innovation of such firms. However, Erasmus (2013) measured firm size as total assets to number of borrowers and total assets to number of staff. Muhammad and Shahimi (2013) measured firm size as book value to total assets, but most manufacturing firms use natural log of total assets. In line with this view, Humera, Khalid, Sundas and Bilal (2011), Makoto and Pascal (2011), Tanveer and Safdar (2013), Zahid, Ali, Shahid and Mohammad (2013) all measured firm size using natural log of total assets. So, firm size was measured using natural log of total assets in this study.

Firm Age: Makoto and Pascal (2011), defines firm age as the number of years a firm has existed since incorporation or after its listing on the stock exchange market. But for Muhammad and Shahimi (2013), firm age could be divided into young firms (operating less than five years), and matured firms (operating equal to or more than five years). It is believed that the risk that a firm will fail decreases with time. Companies that have been in the market for a long period of time have acquired reputation, since they have proven their ability to fulfill long-term contract obligations and their financial stability (Makoto & Pascal (2011).

On the other hand, Muhammad and Shahimi (2013) observed that older firms are not flexible enough to make rapid adjustment, reduce barriers to innovation and make profit owing to the fact that their organizational rigidities limit their growth by inhibiting change as they become harder to change over time, and therefore are likely to fail.

Measurement of Financial Performance

A firm's performance is divided into three types: financial performance, operational performance and overall effectiveness. We are only interested in financial performance in this work. There have been various measures of financial performance (Hult et al., 2008). The financial performance contains overall profitability (ROA, ROI, ROS), profit margin, earnings per share, stock price, sales growth of foreign sales, Tobin's Q. (Prempeh, 2015). This is also the view of Yang et al. (2010).

Return on assets (ROA)

Yang et al. (2010) defined Return on assets (ROA) as a measure of financial performance calculated by dividing net income by the company's net assets. ROA is expressed as a percentage and can be calculated for any company if net income and assets are both positive numbers.

Review of Relevant Empirical Studies

Several researches have sought to empirically establish the factors and variable that affects and determines the success of firms using various financial and non-financial indices. Most of the studies vary in such terms as countries where the studies were carried out, time frame within which the studies were carried out, the sector of the economy on which the studies were done.

Kaguri (2013) examined the relationship between firm characteristics and financial performance in Kenya. The sample comprised 17 life insurance companies over the period of 2008–2012. The studied firm characteristics were: size, diversification, leverage, liquidity, age, premium growth and claim experience of life insurance companies in Kenya. Regression analysis was used to analyze the data. All variables were found to be statistically significant.

Chandrapala and Knápková (2013) studied the effect of firm-specific factors on financial performance in Czech Republic. The sample comprised 974 firms over the period 2005–2008, using data from Albertina database. They used pooled and panel designs for the analysis. They found that the firm size and sales growth had significant positive impact on ROA. However, debt ratio and inventory had significant negative impact on ROA.

Mehari and Aemiro (2013) examined firm-specific factors that determine performance in Ethiopia. The sample comprised nine insurance companies for the period 2005–2010. The firm characteristics were: size, leverage, tangibility, loss ratio (risk), premium growth, liquidity and age. Performance was proxied as return on total assets (ROA). The results of regression analysis revealed that size, tangibility and leverage were positive and statistically significant; however, loss ratio (risk) was negative and statistically significant. Premium growth, age and liquidity were statistically non-significant.

Similarly, Sumaira and Amjad (2013) examined determinants of profitability of firms in Pakistan. The sample comprised 31 insurance firms (life and non-life

insurance) from 2006 to 2011. The study found that leverage, size and age of the firm were significant determinants of profitability. Similarly Sambasivam and Ayele (2013) studied the performance of insurance companies in Ethiopia. The sample comprised nine listed insurance companies from 2003 to 2011. The firm-specific factors were: age, size, volume of capital, leverage, liquidity, growth and tangibility of assets, while profitability was proxied by ROA. They found that growth, leverage, volume of capital, size and liquidity were significant determinants of performance.

Firm Size and Financial Performance

Several studies have been conducted on the size in respect to firms' financial performance, in different industries and in different countries. Firm Size has become dominant in empirical corporate finance studies and has been widely established among the most significant variables (Kioko, 2013).

Agiomirgianakis, Voulgaris, and Papadogonas (2006) investigated a panel of 3,094 Greek manufacturing firms between 1995 and 1999 to identify the key indicators of firm profitability and growth. The results indicate a statistically positive relationship between firm size and ROA and only weak statistically significant relationship (at 10% level) between age and profitability.

Liargovas and Skandalis (2010) discovered positive relationship between firm size and financial performance indicator - return of equity - of 102 listed companies in the Athens Stock Exchange in the period 1997-2004. No significant link was found between firm size and two other indicators – return on assets and return on sales. This finding is to say the least, surprising as it contradicts majority of studies in this area.

Coad, Segarra and Teruel (2013) focused on Spanish manufacturing companies over the period 1998 to 2006 and examined the relationship between firm age and firm performance. The link between firm size and firm performance was positive for all three indicators of firm performance.

Kuncová, Hedija and Fiala (2016) investigated the effect of firm size on the performance of swine raising in Russia. They used sales for the measurement of firm size. They reported that the regression coefficients were positive in both cases, implying the directly proportional relationship between firm size and firm performance.

Omondi and Muturi (2013) also in Kenya on Factors Affecting the Financial Performance of Listed Companies at the Nairobi Securities Exchange in Kenya. Findings showed that Company size had a significant positive effect on financial performance.

Inyama and Chukwuani (2014) carried out a study in Nigeria on the brewery sector to investigate the interactions between Firm Size and Firm's Financial Performance. The study revealed that Firm Size has both short and long term positive effect on Earnings Per Share; with a significant long run influence.

Odalo, Achoki and Njuguna (2016) in Kenya studied Agricultural Firms Listed in the Nairobi Securities Exchange using Correlation and Regression analysis, and found that company size as measured by total assets affects financial performance of agricultural companies listed in NSE positively and significantly.

Firm Age and Financial Performance

Rather recently, the relationship between firm age and survival has been investigated by a growing number of scholars (e.g. Mata and Portugal, 2004; Bartelsman et al., 2005; Marcus, 2006), but the results have not been clear-cut.

Calvo (2006) investigated age effects by focusing specifically on samples of young firms. He tested Gibrat's Law for small, young and innovating Spanish firms: "All the results reject Gibrat's law; the results show that old firms grow less than young ones, and innovating activity – both process and product – is a strong positive factor in the firm's survival and its employment growth" (Calvo, 2006: 117).

Coad et al. (2010) analysed firm performance related to firm age between 1998 and 2006, for Spanish

manufacturing firms. They found that ageing firms experience rising levels of productivity, profits, larger size, lower debt ratios, and higher equity ratios. Furthermore, older firms were found to be better able to convert sales growth into subsequent growth of profits and productivity.

Stakeholder's Theory

This seminar is underpinned by the stakeholders' theory which was propounded by Dr. Edward R. Freeman in the 1984, in his first work, assessing the role of actors in the firm's environment, whose work suggested that "other internal and external actors' impacted firm behavior besides stockholders as the economic model suggests". The stakeholder ecosystem, this theory says, involves anyone that invested and involved in, or affected by the company: employees, environmentalists near the company's plants, vendors, governmental agencies and more. Freeman's theory suggests that a company's real success lies in satisfying all its stakeholders, not just those who might profit from its stock.

Methodology

This study adopts a cross-sectional design based on availability of secondary data, and the units of observation are medium-sized manufacturing firms in the South-East Nigeria, comprising Imo, Anambra, Enugu, Ebonyi, and Abia States.

Population and Sample

The population of the study comprised of fifty-one (51) medium-sized manufacturing firms in the South-Eastern Nigeria. After filtering for those existing for a minimum of five years and remained in operation up to 31st

December 2018, and whose data were available in the Corporate Affairs Commission, we are left with 29 companies in that category, all of which we have used in this study. The seminar therefore employed the census method.

Model Specification

The following shall be the model to be used in the analysis:

The Model:

$$ROA_{it} = \beta_0 + \beta_1 FMSZ_{it} + \beta_2 FMAG_{it} + \epsilon_{it} \dots\dots(1)$$

Where:

ROA	=	Return on Assets
FMSZ	=	Firm Size
FMAG	=	Firm Age
ϵ_{it}	=	Error Term
β_0	=	Intercept (Constant)
$\beta_1, 2, 3, \dots$	=	Parameters to be estimated
t	=	Time Script (t = 5)
i	=	Firms (i = 29).

The model specification agrees with the study of Abdullahi, Madya, Ayoib & Khaled (2011) that considered similar model specifications; though firm age was not considered in their study.

Sources of Data

Secondary sources of data were employed for this research, using financial and statistical formulas as methods to arrive at figures for further statistical computation and analysis. Historical data of return on Assets, firm size, and firm age were sourced from published annual reports of firms, filed at the Corporate Affairs Commission (CAC).

Table 1: Variable Definition and Measurement:

S/ N	VARIABLE	VARIABLE ACRONYM	VARIABLE DEFINITION	MEASUREMENT	SOURCES
	DEPENDENT				
1	Return on Assets	ROA	Measures a firm's profitability by expressing profit as a percentage	Profit after Tax divided by total	Bambang, Elen & Andi (2012).

			of total assets.	Assets	
	INDEPENDENT				
3	Firm Size	FMSZ	Firm size = number of employees or net assets (Pervan&Visic, 2012). We used net assets	Natural Log of total assets.	Zahid et al (2013); Tanveer & Safdar (2013)
4	Firm Age	FMAG	Firm age is the experience and knowledge accumulated since establishment.	Firm's years from year of incorporation	Makato& Pascal (2011); (Mohammad &Shahimi, 2013)

Source: Researcher's Compilation 2020.

Method of Data Analysis

Multiple regression was used for this analysis. In order to check for endogeneity, the study employed the Hausman specification test. This test is necessary due to trade-off between fixed effect and random effect regression. Additional robustness tests adopted in this research include the test for multicollinearity using the Variance Inflation Factor (VIF) and the Breusch-Pagan test for heteroscedasticity to check for the fitness of the model and reliability of the results.

Data Presentation and Analysis

The descriptive statistics of all the variables are presented, correlation matrix was also carried out and the diagnostic test (Multi Colinearity test, Heteroscedasticity test, and Hausman test) which is important to fulfill the assumption of the Classical Linear Regression Model (CLRM), are presented.

Descriptives

This section contains the description of the properties of the variables ranging from the mean, standard deviation, minimum and maximum point of each variable.

Table 2: Descriptive Statistics

Variables	Minimum	Maximum	Mean	Standard Dev.
ROA	-0.6359	4.1285	0.144969	0.3719333
Firm Size	-1.15	37.75	16.34841	6.433069
Firm Age	3	95	44.68966	20.90837
Operating Expenses	0.0267	0.5729	0.2062428	0.1174624

Sources: Output generated using STATA 13

Table 2 above shows that ROA has minimum value of -0.6359 and maximum value of 4.1285. This signifies that, the least company of the sampled firms incurred 63 percent loss for each of single Naira asset of the firm. On the other hand, some profitable companies among the sampled firms earned 4.12 percent of single Naira asset in the firm with an average of 0.144969. This implies that the average score of return on asset in this domain is 14.49% with a standard deviation of 0.3719333.

Correlation Matrix

The correlation matrix is used to determine the degree of association between dependent variable and independent variables. It is also used to identify whether there is relationship among the independent variables themselves, to be able to detect if multicollinearity problem exists while the full result is attached as appendix.

Table 3: Correlation Matrix

Variables	ROA	Firm Size	Firm Age
ROA	1		
Firm Size	0.1080	1	
Firm Age	0.1958	-0.0613	1
	-0.1415	0.4637	
	0.0896		

Sources: Output generated using STATA 13

Table 4: Multicollinearity Test

Variables	VIF	1/VIF
Firm size	1.40	0.712065
Firm age	1.05	0.950787
Mean VIF	1.20	

Sources: Output generated using STATA 13

The VIF of the variables are within the acceptable range of higher than 1 but less than 10, that is, an indication of absence of multicollinearity problem among all the variables which is further confirmed by the overall mean VIF of 1.20. Similarly, the Tolerance Values (TV) is within the accepted range of less than 1 but closer to 1. This supported the evidence that a variable is not collinear with the other regressors. This shows that the independent variables are appropriate and fit well into the model. From the table; ROA reveals positive and insignificant correlation with firm size. Furthermore, ROA revealed a negative and no significant relationship with firm age. Firm size is negative correlated and significant with operating expenses though not significant

with firm age. This means that the two independent variables can be together in the same model when used in the regression because none of the correlation has an absolute value above 0.9, meaning that there is no multicollinearity problem.

Heteroskedasticity Test

The Breusch-pagan\cook-weisberg test for heteroskedasticity was used to test the presence of heteroskedasticity. The null hypothesis is that the error variances are constant; while the alternative hypothesis is that the variances are a function of one or more explanatory variables (Gujarati & Porter, 2009).

Table 5: Heteroskedasticity Test

	Model: Return on Assets	
Ho:	Constant variance	
Variables	Fitted values of ROA	
Chi ² (1)	313.89	
prob>chi ²	0.0000	

Sources: Output generated using STATA 13

This test is used to check the normality of residuals in the result. Table 5 shows the ROA model indicates a chi square value of 313.89 and probability value of 0.0000. This indicates the presence of heteroskedasticity, since it

is significant at 5%, necessitating a further test for fixed and random effect to determine the best model for the study.

Table 6: Hausman specification and Lagrangian Multiplier Test and Fitness of the Model

Model one	Chi ²	Prob>chi ²
Hausman Test		
Return on Assets (ROA)	4.81	0.4395
Lagrangian Multiplier Test		
Return on Assets (ROA)	20.10	0.0000
Fitness of the Model		
F-Statistics (Wald)	187.65	0.0000

Sources: Output generated using STATA 13

Table 6 above indicates that result from the Hausman fixed and random effect test revealed a Chi² value of 4.81 with p-value of 0.4395 that is statistically not significant. This implies that the test considered the random effect. More so, a lagrangian multiplier test for random effect revealed a Chi² value of 20.10 with a p-value of 0.000 that is statistically significant at 1% level of significance. This implies that the test considered the random effect as the most appropriate estimator for the study.

Random Effect Regression Result

The outcome of Table 6 and 7 above suggests that the most appropriate model is model one which is Random Effect model. The regression result has two significant variables which are leverage and liquidity and three insignificant variables which include firm size, firm age and operating expenses. Therefore, our interpretation is based on random effect regression model.

Table7: Summary of Random Effect Regression Result for the Model

Variables	Coefficient	t-value	P-value
Firm size	0.004967	0.87	0.382
Firm age	-0.0000352	-0.02	0.982
Constant	0.4103433	2.49	0.013
R²			0.5036
F-Statistics	187.65		0.0000

Sources: Output generated using STATA 13 @ 5% level of significant

The aggregate value impact on return on assets shows that firm size and firm age, explain an overall variation in return on assets of 50% as indicated by the R-squared (0.5036). While 49.64% variation in return on assets is caused by other factors not captured in the model of this research. The table further reveals that F- statistics is

187.65 with a p-value of 0.0000, which shows that the model is fit and significant at 1%.

Test of Hypothesis

The output from STATA used for the analysis is produced and attached in Appendix B. From the analyses, the following outcomes is drawn.

Hypothesis 1: Firm size has no significant effect on the return on assets:

The regression result revealed that firm size has shown a coefficient value of 0.004967 and a p-value of 0.382. This signifies that firm size has positive but insignificant influence on financial performance (ROA) of firms in Nigeria, that is, the greater the size of a firm, the better the reported ROA. This implies that for every 1% increase in firm size, the ROA will slightly improve by 0.004%. The finding is in line with the findings of Foyeke, Ojeka and Aanu, (2015) and Odalo, Achoki and Njuguna, (2016) but contradict the study of Lopez-Valeiras et al, (2016) who found that firm size is negatively related to profitability. We therefore accept the hypothesis that firm size has no significant influence on the financial performance of those companies.

Hypothesis 2: Firm age has no significant effect on the return on assets

The result reveals that firm age with coefficient of -0.0000352 and p-value of 0.982. It implies that every 1% increase in firm age leads to 0.0000353% decrease in return on assets holding other variables constant. The finding is aligned with the study results of Maja, Ivica and Marijana, (2017), that firm age negatively affects profitability, but negates the studies of Ofuan and Izien (2016) and Omondi and Muturi, (2013) that found that firm age has a positive and significant impact on return on assets.

Conclusion and Recommendations

The study revealed that firm size has positive but insignificant influence on financial performance (ROA)

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of firms in Nigeria, that is, the greater the size of a firm, the better the reported ROA. This implies that large firms have advantages, which may be the result of economies of scale. On the other hand, the study reveals that firm profitability decreases with age. This implies that as the firms grow older, they become inefficient, tend to have more operational load such as employees, than are needed. This also empirically evident in Nigeria in the service area such as deposit money banks where the newer banks show clearly more profit than the first generation banks who have more branches, more assets and more goodwill.

We can then recommend that the sampled firms should make sure that they strive to increase their operations.

The studied firms should also invest only in clearly profitable, young and aggressive businesses as the result showed that when they grow older, the returns on assets used reduce correspondingly which may be as a result of poor corporate governance to protect shareholders' interest.

The medium-sized manufacturing firms in South-East Nigeria should invest more in expanding the size of their operations in order to maintain the right level of profitability since the study has found out that firm size positively influences return on assets of those firms.

It is recommended that future researchers should expand the horizon of research in this area to cover the whole country and may also expand the scope to cover other business sectors, such as the service sector or the agricultural sector.

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