

Effect of firm size on profitability: Evidence from Nigerian manufacturing sector


Prof. Akinyomi Oladele John (FCA, FIARSA, ACTI)

Cite this paper

Downloaded from [Academia.edu](#) 

[Get the citation in MLA, APA, or Chicago styles](#)

Related papers

[Download a PDF Pack](#) of the best related papers 



[Determinants of Capital Structure in Nigeria](#)

Prof. Akinyomi Oladele John (FCA, FIARSA, ACTI)

[Akinyomi, O. J., & Olagunju, A. \(2013\). Determinants of capital structure in Nigeria. International Journal...](#)

Prof. Akinyomi Oladele John (FCA, FIARSA, ACTI)

[The Impact of Credit Management Strategies on Liquidity and Profitability](#)

Kenneth E N O C H O kpala

Prime Journal of Business Administration and Management

ISSN: 2251-1261

PRIME
J o u r n a l s



**Effect of
FIRM SIZE ON PROFITABILITY**

*Evidence from Nigerian
Manufacturing Sector*

**Akinyomi Oladele John
Olagunju Adebayo**

Full Length Research Paper

Effect of Firm Size on Profitability: Evidence from Nigerian Manufacturing Sector

Akinyomi Oladele John and Olagunju Adebayo

Financial Studies Department, Redeemer's University, Ogun State, Nigeria.

Accepted 11th September, 2013

Firm size has been recognized as an essential variable in explaining organizational profitability and a number of studies have tried to explore the effect of firm size on profitability. However the results of these prior studies have been inconsistent and controversial, thus calling for further investigation. This study examined the effect of firm size on the profitability of Nigerian manufacturing sector. Panel data set over the period of 2005-2012 was obtained from the audited annual reports of the selected manufacturing firms listed in the Stock Exchange. Return on assets (ROA) was used as a proxy for profitability while log of total assets and log of turnover were used as proxies for firm size. Furthermore, liquidity, leverage and the ratio of inventories to total assets were used as the control variables. The results of the study revealed that firm size, both in terms of total assets and in terms of total sales, has a positive effect on the profitability of Nigerian manufacturing companies. Meanwhile, on the control variables, a negative relationship with inventory was obtained while others have positive relationship. It is recommended is for future researchers to investigate sector effects on the relationship between firm size and profitability in Nigeria.

Key words: Manufacturing, profitability, organizational size, Nigeria.

INTRODUCTION

Shaheen and Malik (2012) described size of a firm as the quantity and array of production capability and potential a firm possesses or the quantity and diversity of services a firm can make available concurrently to its clients. The size of a firm is very essential in today's world due to the phenomenon of economies of scale. Bigger firms can manufacture items on much lower costs in contrast to smaller firms. Firms of the modern era look to increase their size so as to get a competitive edge on their competitors by lowering production costs and increasing their market share. Abdurahman, Awad, Erik and Jeffrey (2003) observed that the nature of the relationship that exists between firm size and profitability is an essential matter that may shed some light on the factors that enhance profits.

Statement of the problem

Size has been recognized in the literature as a fundamental variable in explaining organizational profitability and a number of studies have tried to explore the effect of firm size on profitability (Hardwick, 1997; Wu, 2006; Punnose, 2008; Serrasqueiro and Nunes, 2008).

However the results of these prior studies have been inconsistent and controversial; while some scholars reported positive relationship, others reported negative relationship, thus calling for further investigation (Hardwick, 1997; Wu, 2006; Athanasoglou, Brissimis and Delis, 2008; Punnose, 2008).

Objective of the study

In the light of the inconsistent nature of prior studies, the main objective of this study is to examine the relationship between firm size and profitability of Nigerian manufacturing sector. Moreover, the following are the specific objectives of this study:

1. To examine the relationship between total assets (as a measure of size) and the profitability of Nigerian manufacturing sector.
2. To investigate the relationship between turnover (as a measure of size) and the profitability of Nigerian manufacturing sector.

Research questions

In order to achieve the objectives of this study, the

following research questions have been raised:

1. What is the relationship between total assets (as a measure of size) and the profitability of Nigerian manufacturing sector?
2. What is the relationship between turnover (as a measure of size) and the profitability of Nigerian manufacturing sector?

Statement of hypotheses

Similarly, the following research hypotheses have been formulated in an attempt to provide empirical evidence on the existence of relationship between the variables of the study:

H_{0i}: There is no significant relationship between firm size (measured by total assets) and profitability in Nigerian manufacturing sector.

H_{0ii}: There is no significant relationship between firm size (measured by turnover) and profitability in Nigerian manufacturing sector.

Literature review

An approach in classifying theories of the firm is presented by Bauman and Kaen (2003). Bauman and Kaen (2003) classify these theories as technological, organizational and institutional; and described each of them as follows:

- (i) Technological theories focus on the production process and highlight physical capital and economies of scale and scope as variables that determine most favourable firm size and, by inference, profitability.
- (ii) Organizational theories connect profitability and size together with organizational transaction costs, agency costs and span of control costs. They also include critical resource and competency theories of the firm.
- (iii) Institutional theories relate firm size to variables such as legal systems, anti-trust regulation, patent protection, market size and the development of financial markets. Although different theories provide various insights on connection between firm size and its profitability, there is no unique standpoint whether this association is negative, positive or no-relationship at all.

Researches on the effect of organizational size on organizational profitability have generated mixed results ranging from those supporting a positive relationship among these variables to those opposing it. Additionally, under the same sample of the firms, this relationship may be positive over some firm size ranges and negative for others. Beside previously presented theoretical explanations, contradictory empirical results could be a result of different used samples, industry groups, time horizons, indicators and business environment. Due to all stated above, some of the studies will be subsequently presented together with their main empirical results.

Amato and Wilder (1985) examined size-profitability relationship in linear as well as quadratic form on a sample of a US manufacturing firms. The results of their

analysis revealed that there is no relationship between firm size and profit rate. Similarly, Majumdar (1997) investigated the impact that firm size has on profitability and productivity of firms, using a sample of 1020 Indian firms. While controlling for other variables that can influence firm performance, he found evidence that larger firms are less productive but more profitable.

Ammar et al. (2003) examined the nature of the size-profitability relationship on a sample of electrical contractors for 1985-1996 periods using financial and economic data. With the aid of a first-order autoregressive model built into the error term, the authors found a significant difference in terms of profitability between small, medium and large firms. The study revealed that profitability drops as the firms grow larger than \$50 million in sales.

Jonsson (2007) studied the size-profitability relationship using a sample of 250 Icelandic firms. It was reported that firm size has negative but no statistically significant effect on profitability. In the same way, Amato and Burson (2007) tested size-profit relationship for firms operating in the financial services sector. The authors examined both linear and cubic form of the relationship. With the linear specification in firm size, the authors revealed negative influence of firm size on its profitability. However, this influence was not statistically significant. On the other hand, the authors found evidence of a cubic relationship between ROA and firm size.

Furthermore, Papadognas (2007) conducted an investigation on size-profitability relationship on a sample of 3035 Greek manufacturing firms for the period 1995-1999. After dividing firms into four size classes he applied regression analysis which revealed that for all size classes, firms' profitability is positively influenced by firm size.

Serrasqueiro and Nunes (2008) investigated the relationship between firm size and performance of small and medium sized Portuguese companies for the period 1999 to 2003. Their results indicate that there is a positive and statistically significant relationship between size and profitability of SMEs. On the other hand, for the large Portuguese companies, they found a statistically insignificant relationship between size and profitability.

Lee (2009) examined the role that firm size plays in profitability. He used fixed effect dynamic panel data model and performed analysis on a sample of more than 7000 US publicly-held firms. Results showed that absolute firm size plays an important role in explaining profitability. However, this relationship was nonlinear, meaning that gains in profitability reduced for larger firms.

A positive relationship between firm size and profitability was found by Vijayakumar and Tamizhselvan (2010). In their study, which was based on a simple semi-logarithmic specification of the model, the authors used different measures of size (sales and total assets) and profitability (profit margin and profit on total assets) while applying model on a sample of 15 companies operating

Table 1: Descriptive statistics

Variables	Observations	Mean	Standard Deviation	Minimum	Maximum
ROA	40	0.2423	0.1667	0.027	0.393
LIQ	40	1.0856	0.4239	0.655	1.559
LEV	40	0.5464	0.1920	0.325	0.691
INV	40	0.3518	0.0880	0.081	0.276
SIZE_TA	40	8.1799	0.3245	7.699	8.404
SIZE_TS	40	7.9498	0.6793	6.936	8.403

Source: Audited annual reports of the selected firms for the various years

in South India.

Maja and Josipa (2012) examined the relationship between firm size and business success. All the data necessary for their research were obtained from the web site of Croatian Financial Agency and from Amadeus database. Since data were available only for medium size and large enterprises, only these enterprises were analyzed during the period of 2002 to 2010 financial year. The sample comprised of 2,050 firms per year, yielding a total of 18,492 observations for the period under consideration. In order to test the relationship between firm size and profitability in Croatian manufacturing industry, several different measures of firm’s financial performance and firm size were employed. Financial performance measures used included return on assets, return on equity, profit margin, earnings before interest and tax, earnings before interest, tax, depreciation and amortization. Meanwhile, firm size was measured by natural logarithms of firm assets and natural logarithms of number of employees. The results of the regression analysis conducted showed that firm size has a weak positive impact on firm profitability.

Halil and Hasan (2012) carried out their study on the effect of firm size on profitability, with evidence from Turkish manufacturing companies. The data for their study were retrieved from web sites of Istanbul Stock Exchange (ISE) and Public Disclosure Platform. The period of the study covered the years between 2005 and 2011 for the manufacturing firms listed in the ISE. All the firms that were present for the entire period of the study were considered in order to obtain a uniform panel. The firms that were on the Watch List Companies Market and have missing data were excluded from the data set. After this elimination a balanced data set of 143 companies was used, resulting in a final sample of 1001 observations. Profitability was measured by using ROA, while total assets and total sales were used as the proxies of firm size. Furthermore, liquidity, leverage and the ratio of inventories to total assets were considered as the control variables. According to the results, both in terms of total assets and in terms of total sales, firm size has a positive impact on the profitability of Turkish manufacturing companies. When it comes to the control variables; a negative relationship with the ratio of total liabilities to total assets and profitability was found.

METHODOLOGY

The population of the study comprises the manufacturing companies that are listed in the Nigerian Stock Exchange. The period of the study covered the years between 2005 and 2012 for the manufacturing firms listed in the Nigerian Stock Exchange. The sample comprised of five (5) randomly selected beverages manufacturing companies per year, yielding a total of forty (40) observations for the period under consideration. Secondary data were obtained from the audited annual reports of the relevant years. The analysis was carried out using Pearson Product Moment Correlation coefficient and regression with the aid of SPSS Statistical Package 17.0 version. The regression models are as follows:

$$ROA_{it} = \alpha_0 + \alpha_1SIZE_TA_{it} + \alpha_2LIQ_{it} + \alpha_3LEV_{it} + \alpha_4INV_{it} + \eta_i + \epsilon_{it} \dots\dots\dots(i)$$

$$ROA_{it} = \alpha_0 + \alpha_1SIZE_TS_{it} + \alpha_2LIQ_{it} + \alpha_3LEV_{it} + \alpha_4INV_{it} + \eta_i + \epsilon_{it} \dots\dots\dots(ii)$$

Where: i refers to an individual firm, t refers to year, η_i denotes unobservable heterogeneity (individual effect) specific to each firm, α_0 is a constant and ϵ is an error term. Log of total assets and log of turnover used as proxies for firm size while return on assets (ROA) is used as a proxy for profit. Meanwhile the control variables include: liquidity (measured by CA/CL), leverage (measured by TL/TA), and inventory management (measured by INV/TA)

RESULTS AND DISCUSSIONS

For each of the variables obtain number of observation, mean, standard deviation, minimum and maximum; correlation matrix is shown in table 1.

Table 2 reports the correlation among the variables of this study. It is glaring that the correlations between ROA and other variables are statistically significant. According to the results, size both in terms of total assets and total sales, leverage and liquidity are positively correlated with ROA, while inventory is negatively correlated. It is also evident that the correlations between all of the variables are significant except between size in terms of total sales and leverage.

Table 3 provides the coefficient estimates for each of the regression models. The results indicate that both in terms of total assets (SIZE_TA) and in terms of total

Table 2: Correlation matrix

Variables	ROA	LIQ	LEV	INV	SIZE_TA	SIZE_TS
ROA Pearson Correlation Sig (2-Tailed)	1.000	0.010 (0.981)	0.333 (0.421)	-0.097 (0.820)	0.262 (0.531)	0.367 (0.371)
LIQ Pearson Correlation Sig (2-Tailed)	0.010 (0.981)	1.000	-0.524 (0.182)	0.234 (0.578)	-0.629 (0.095)	-0.568 (0.142)
LEV Pearson Correlation Sig (2-Tailed)	0.333 (0.421)	-0.524 (0.182)	1.000	-0.403 (0.322)	0.593 (0.122)	0.238 (0.571)
INV Pearson Correlation Sig (2-Tailed)	-0.097 (0.820)	0.234 (0.578)	-0.403 (0.322)	1.000	-0.821 (0.013)	-0.413 (0.309)
SIZE_TA Pearson Correlation Sig (2-Tailed)	0.262 (0.531)	-0.629 (0.095)	0.593 (0.122)	-0.821 (0.013)	1.000	0.766 (0.027)
SIZE_TS Pearson Correlation Sig (2-Tailed)	0.367 (0.371)	-0.568 (0.142)	0.238 (0.571)	-0.413 (0.309)	0.766 (0.027)	1.000

* Correlation is significant at the 0.05 level (2-tailed).

Source: Authors' calculations

Table 3: Estimation results

Variables	Model 1	Model 2
LIQ	0.217 (1.114)	0.178 (1.151)
LEV	0.241 (0.594)	0.454 (1.184)
INV	1.727 (0.988)	0.522 (0.600)
SIZE_TA	0.476 (1.085)	-
SIZE_TS	-	0.124 (1.298)
Constant	-4.238 (-1.087)	-1.282 (-1.241)
Number of observations	40	40
R	0.629 ^a	0.679 ^a
R ²	0.396	0.461
Adjusted R ²	-0.409	-0.257
Std Error of the Estimate	0.059847	0.056520
F statistic (p-value)	0.492	0.642
Sig.	0.748 ^a	0.669 ^a
Durbin-Watson	2.671	3.165

Values in brackets are *t* statistics.

Source: Authors' calculations

sales (SIZE_TS), size is positively related to profitability of firms. According to this result, firm size has a positive impact on the profitability of Nigerian manufacturing companies that are listed in the Nigerian Stock Exchange market. This finding is in line with the results of Papadognas (2007), Serrasqueiro and Nunes (2008), Vijayakumar and Tamizhselvan (2010), Halil and Hasan (2012), Maja and Josipa (2012) and supports the argument that larger firms have a greater possibility of taking advantage of economies of scale by exploiting experience curve effects and setting prices above the competitive level (Hardwick, 1997) and those firms have the chance of capital cost savings with the economies of scale (Ravenscraft and Scherer, 1987). However, the finding of this study is at variance with the results of Amato and Wilder (1985), Ammar et al. (2003), Jonsson

(2007) and Lee (2009) as they reported a negative relationship between firms' size and profitability.

CONCLUSION

This study examined the effect of firm size on the profitability of Nigerian manufacturing sector. Panel data set over the period of 2005-2012 was obtained from the audited annual reports of the selected manufacturing firms listed in the Stock Exchange. Return on assets (ROA) was used as a proxy for profitability while log of total assets and log of turnover were used as proxies for firm size. Furthermore, liquidity, leverage and the ratio of inventories to total assets were used as the control variables. The results of the study revealed that, both in terms of total assets and in terms of total sales, firm size has a positive effect on the profitability of Nigerian manufacturing companies. Meanwhile, on the control variables, a negative relationship with inventory was obtained.

Recommendations

Future research could investigate the sector effects on the relationship between firm size and profitability. Also, a comparison could be made with firms of other developing economies which have similar economic environment with Nigeria.

REFERENCES

- Abdurahman A, Awad SH, Erik VN, Jeffrey SR (2003). Indicator variables model of firm's size-profitability relationship of electrical contractors using financial and economic data. *Journal of Construction Engineering and Management*, March/April, 192-197.
- Amato L, Wilder RP (1985). The Effects of Firm Size on Profit Rates in U. S. Manufacturing. *Southern Econ. J.*, 52(1): 181 – 190.
- Amato LH, Burson TE (2007). The effects of firm size on profit rates in the financial services. *J. Econ. Econ. Edu. Res.*, 8(1): 67-81.

- Ammar A, Hanna AS, Nordheim EV, Russell JS (2003). Indicator variables model of firm's size-profitability relationship of electrical contractors using financial and economic data. *J. Construct. Eng. Manage.*, 129(2): 192-197.
- Athanasoglou PP, Brissimis NS, Delis MD (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *J. Inter. Finan. Marts., Inst. Money.*, 18: 121-136.
- Baumann HD, Kaen FR (2003). Firm size, employees and profitability in U.S. manufacturing industries. *Soc. Sci. Res. Net.*, 13: 71-79.
- Halil EA, Hasan AK (2012). The effect of firm size on profitability: An empirical Icelandic firms. *Bifröst J. Soc. Sci.*, 1: 33-42.
- Jónsson B (2007). Does the size matter? The relationship between size and profitability of Icelandic firms. *Bifröst J. Soc. Sci.*, 1: 43-55.
- Lee J (2009). Does size matter in firm performance? Evidence from US public firms. *Inter. J. Econs. Bus.*, 16(2): 189-203.
- Maja P, Josipa V (2012). Influence of firm size on business success. *Croatian Operational Research Review (CRORR)*, 3: 213-224.
- Majumdar SK (1997). The Impact of size and age in firm-level performance: Some evidence from India. *Review of Industrial Organization*, 12: 231-241.
- Papadogonas TA (2007). The financial performance of large and small firms: Evidence from Greece. *Inter. J. Finan. Serv. Manage.*, 2(1/2): 14-20.
- Punnose EM (2008). A profitability analysis of business group firms versus individual firms in the Indian electrical machine manufacturing industry. *The Icfai J. Manage. Res.*, 7: 52-76.
- Serrasqueiro ZS, Nunes PM (2008). Performance and size: empirical evidence from Portuguese SMEs. *Small Business Economics*, 31(2): 195-217.
- Shaheen S, Malik QA (2012). The impact of capital intensity, size of firm and profitability on debt financing in textile industry in Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, 3(10): 1061-1066.
- Vijayakumar A, Tamizhselvan P (2010). Corporate size and profitability: An empirical analysis. *College Sadhana – Journal for Bloomers of Research*, 3(1): 44-53.
- Wu ML (2006). Corporate social performance, corporate financial performance, and firm size: A meta-analysis. *J. Ame. Aca. Bus, Cambridge* 8(1): 34-47.