PROFITABILITY AND LEVERAGE: EVIDENCE FROM NIGERIAN FIRMS

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ABSTRACT

This study examines the profit profile of firms in Nigeria and analyzes the impact of leverage on profitability for the period 1999-2007. The results show that aggregate profit level for the firms decreased by 0.02 percent yearly over the study period. However, when disaggregated into sectors, a few firms actually experienced an increased profit level. The results show that firm size has a significant positive effect on profitability, while leverage has negative effect. The paper suggests that expansion, increased sales and low debt ratios enhance firm profitability.

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KEYWORDS: Profitability, leverage

INTRODUCTION

The analysis of financial leverage on profit profiles of firms occupy a substantial portion of financial literature (Dean 1968, Sheel 1994 and Barthwal, 2000). This arises because of two main reasons: the importance of profitability as an index for assessing business efficiency and controversy surrounding the relationship between financial leverage and profitability. Although, most existing studies concentrate on developed countries not many studies have focused on developing countries like Nigeria. Specifically no known study has examined the issue in Nigeria. This paper addresses this gap. This paper seeks to analyze the profit profile of firms in Nigeria and to examine the impact of financial leverage on profitability using panel data.

Analysis of the profit profile of Nigerian firms is important because it provides the basis for judging whether business firms run efficiently or otherwise. The literature asserts that profit is the primary measure of a firm's efficiency and success (Barthwal 2000). Secondly, a deeper understanding of the trends and patterns of firm's profitability assist managers in evolving policies to enhance the profit level of their organisations. In addition, knowledge of the relationship between leverage and profitability helps to show how effectively firms are able to debt finance.

The remainder of the paper is organised as follows. Section 2 discusses the relevant literature. Section 3 discusses the methodology. Section 4 provides the results of the analysis and Section 5 concludes the paper.

LITERATURE REVIEW

In view of the importance of profitability on firm growth and survival, a substantial theoretical and empirical body of knowledge examines the issue. . The major theoretical developments in profitability analysis include the establishment of a link between market structure and profitability. In this earlier stage, inter-industry differences in profitability was explained in terms of a single element of market structure i.e. concentration. However, over the years, the literature has identified several other factors as determinants of profitability. These factors include firm growth, capital intensity, advertisement intensity, age of firm, business cycle trends among others. However, since the aim of this study is not to discover

determinants of profitability but rather to examine whether leverage is significantly related to firm's performance, the literature review focuses on empirical evidence related to this issue.

There are many empirical works on the relationship between leverage and profitability. However, the findings from these studies are mixed. Some studies found positive relationships between leverage and profitability while others identified a negative relationship. A few others found no relationship between the two. Studies by Robb and Robinson (2009), Ruland and Zhou (2005) believe that there is a positive relationship between leverage and profitability. According to Jensen (1986), profitable firms signal quality by leveraging up, resulting in a positive relation between leverage and profitability. This agrees with Modigliani and Miller (1963). Robb and Robinson (2009) found that gains from leverage are quite significant, and the use of debt enhances the firm market value. It is argued that financial leverage has a positive effect on the firm's return on equity given the earning powers of the firm's assets is greater than the average interest cost of debt to the firm.

A study by Abor (2005) reported a significantly positive relationship between total debt and total assets and profitability measured as return on equity. In the same way, Chandrakumarmangalam and Govindasamy (2010) found that leverage is positively related to profitability and shareholders wealth are maximized when firms are able to employ more debt. In the view of Berkivitch and Israel (1996), a firms debt's level and value is positively related when shareholders have total control over the firm's business and it is negatively related when debt holders have the power to influence the course of the business. Hence, the impact of debt on firm value is a function of the balance of power within a firm. In a situation where debt holders have more power, a negative leverage would obtain. The reverse is however the case where shareholders have more power. The use of high levels of debt in the capital structure leads to a decrease or increase in the return on shareholders' capital (return on owner's equity).

In contrast to the above view, some studies have found negative relationships between leverage and profitability (Negash, 2001; Phillips and Sipahioglu, 2004; Myers, 2001). Negash (2001) found that debt has a negative impact on the profitability of firms quoted on the Johanesburg Sock Exchange. He argues the potential gains from leverage over an infinite period are significant and comparable to what is reported in studies from developed countries in support of the Modigiliani and Miller 1963 theory. However, the actual gains were not as implied by the 1963 theory, as the effective tax rate for most firms in South Africa is lower than the statutory rate.

Titman and Wessels (1988) observed that highly profitable firms have lower levels of leverage than less profitable firms do because they first use their earnings before seeking outside capital. Moreover, stock prices reflect how the firm performs. Some recent studies including Sheel (1994), Sunder and Myers (1999) and Wald (1999) have corroborated these findings. For example, Wald (1999) found that profitability has a negative effect on debt to asset ratios in a heteroskedatic tobit regression model. Sheel (1994) reported a negative relationship between debt-to-asset ratio and non-debt tax shield and between firm's leverage behaviour and its past profitability.

Fama and French (1998) reported that debt does not concede taxes benefits. The degree of leverage tends to generate agency problems among shareholders and creditors that predict negative relationships between leverage and profitability. Other studies that reported negative relationships between leverage and profitability include Myers 1984, Chittenden et al. 1996, Michaelas et al. 1999, Cassar and Holmes 2003, Gedajlovic et al. 2003 and Lincoln et al 1996.

A few other studies reported no relationship between leverage and profitability. Long and Malitz (1986) found no relationship between capital structure and profitability. Hall et al. (2000) found that profitability is not statistically significant to long-term debt. Amjed (2007) reported that total debt as a whole has no

association with firm profitability because of the inherited different characteristics of short-term and long-term debt.

DATA AND METHODOLOGY

In order to analyze the profit profile, the study utilized data obtained from sixty-six purposively selected firms from listed non-financial firms on the Nigerian Stock Exchange (NSE). Only firms listed before 1999 and were still in operation at the end of 2007 financial year are chosen. Financial institutions such as banks, insurance companies etc were excluded from the sample due to the format used in reporting their balance sheets and different components of working capital such as stock is missing from the balance sheet. This makes their capital structure significantly different from those of non-financial firms.

The sample of firms cut across fifteen (15) sectors of the Nigerian Stock Exchange classification. They are Automobile and Tyre, Breweries, Building Materials, Chemical and Paints, Computer and Office Equipment, Conglomerates, Construction, Food Beverages and Tobacco, Healthcare, Industrial/Domestic Products, Machinery, Packaging, Petroleum, Printing and Publishing, and Real Estate.

To analyse the profit profile of the selected quoted companies over the study period, we first examined the movement of aggregate profit over the study period. Next, we obtained linear least square trends of aggregate profits for the entire 66 firms and for the various subsectors. Chi-square statistics were compared for actual and trend series to identify any significant difference between the two series. To examine the impact of leverage on the profitability of selected firms, we estimate a simple regression in which we relate profitability to the variable of interest, in our case leverage. However, in order to enhance the robustness of our findings we incorporate one control variable namely, firm size in the model. We measure firm size as the firms' total assets. The estimated relationship takes the form:

$$\pi_{it} = \beta_o + \beta_1 Lev_{it} + \beta_2 Siz_{it} + \varepsilon_{it}$$

Where π_{it} = profitability of firm i at time t,……. i = 1,2,3…….. 66 firm, β_o = intercept, Lev_{it} = leverage for firm i at time t, β_i = coefficients of X_{it} = independent variables for working capital of firm i at time t, and ε_{it} = error term.

Profitability is the dependent variable while leverage and the control variable size are independent variables. Our area of concern is the magnitude and nature of the relationship. The signs and values of coefficients along with measures of significance are pertinent to our intention.

RESULTS

Trend and Pattern of Aggregate Profitability

Table 1 shows the aggregate profit for all firms selected for the study. The aggregate profit dropped slightly from ₦493.193m in 1999 to ₦433.202m in 2000. The figure increased to ₦727.093m in 2003 but dropped sharply to ₦367.806m in 2004. This possibly reflects the aftermath of the election that took place in the middle of 2003. The uncertainty in business environment that resulted from the election might have affected production and profit levels of firms. The aggregate profit level increased from ₦367.806m in 2004 to ₦563.191m in 2007.

Table 1 shows linear least square trend values of firm profitability. The yearly percentage increase in aggregate profitability of -0.02 shows the firms together experienced a decline in profit over the study

period. The differences between actual and trend values were negative for the years 1999 – 2000 and from 2004 to 2006. The values were however positive for 2001 – 2003 and 2007. The calculated chi-square value of 10.50 is lower than the table chi-square value of 12.592. This means that there is no significant difference between the actual and trend values of profitability at 5 percent level.

Table 1: Original and trend values of profit (₦m)

Year (1)	Actual (2)	Trend (3)
1999	493.19	591.63
2000	433.70	578.82
2001	731.35	566.00
2002	723.04	553.19
2003	727.09	540.38
2004	367.80	527.57
2005	401.80	514.75
2006	422.23	501.94
2007	563.19	489.13

The table shows the actual and trend values of profit for the entire firms over the period 1999-2007. Column (2) shows the actual value while column (3) shows the trend generated using trend regression Prof =$\alpha + \beta_1$(trend). The estimated result is Prof = 6.377 – 0.023trd

As shown in Table 2, when disaggregating the data into sectors, two main features were discernable. The first was that, nine sectors experienced downward trends in their profit levels in the first two to four years and seven had a positive trend. The sectors with positive trends were automobile and tire, breweries, building materials, chemical and paints, computer and office equipment as well as health. Eight sectors had positive profit level for the period 1999-2007 while three sectors had negative profit level.

The linear least square regression estimates are shown in Table 3. The results show that the yearly percentage change in profit is negative for five sectors. These sectors are construction, food and beverages, industrial/domestic, machinery/marketing and printing and publishing. The remaining ten sectors have positive yearly percentage change. The yearly percentage change in profit ranges from -0.445 for machinery/marketing to 0.453 for breweries. The chi square reported in Table 3 is to ascertain whether there are significant differences between the actual and trend values of sector profitability. The results show there are significant differences between the actual and trend values of profitability for three sectors namely, chemical and paints, computer and office equipment and machinery/marketing. However, for the remaining sectors there is no significant difference between the actual and trend values of profitability of these sectors.

Table 2: OLS Estimates (Dependent variable PROF)

Industry	**C**	**Trend**
Automobile and Tyre	2.125(10.088)***	0.035(0.94601)
Breweries	-30.381(-1.293)	0.453(0.1085)
Building Materials	1.509(3.459)***	0.176(2.266)**
Chemical and Paints	7.600(12655)***	0.001(4677.9)***
Computer and Office	0.960(3.312)***	0.002(0.03703)
Conglomerates	0.309(0.61215)	0.171(1.470)
Construction	1.951(7.463)***	-0.073(-1.566)
Food and Beverages	3.394(2.692)**	-0.252(-1.304)
Health	0.986(0.90711)	0.215(1.109)
Industrial/Domestic	2.599(5.320)***	-0.138(-1.445)
Machines/Marketing	-8.647(-1.296)	-0.445(-0.3752)
Packaging	1.584(2.707)**	0.008(0.075)
Petroleum	2.865(19.429)***	0.028(1.054)
Printing and Publishing	3.258(11.768)***	-0.164(-3.344)***
Real Estate	1.778(5.014)***	0.111(1.757)*

*The table shows the trend regression estimates of the equation Prof =$\alpha + \beta_1$(trend) for each of the sectors over the period 1999-2007. Column 2 shows the constant and column 3 shows the coefficient of trend. The trend is in units of years. The figures in parenthesis are t-statistics while the others not in parenthesis are coefficients. T values are in parentheses. ***, ** and * denote significant at 1%, 5%, and 10% levels respectively*

Table 3: Calculated and Tabulated Chi-square for Profitability

Sectors	χ^2 calculated	χ^2 Tabulated	Decision Rule
Automobile and Tyre	12.000	21.026	No significant difference
Breweries	13.750	21.026	No significant difference
Building Materials	11.000	15.507	No significant difference
Chemical and paints	36.000	26.296	Significant difference
Conglomerates	14.850	24.996	No significant difference
Construction	11.250	16.919	No significant difference
Computer and Office Equipment	27.000	24.996	Significant difference
Food and Beverages	21.600	24.996	No significant difference
Health	19.500	26.296	No significant difference
Industrial/Domestic	14.625	26.296	No significant difference
Machinery/Marketing	12.750	12.592	Significant difference
Packaging	16.125	26.296	No significant difference
Petroleum	9.375	12.592	No significant difference
Printing and Publishing	18.750	26.296	No significant difference
Real Estate	10.000	16.919	No significant difference

The table shows the calculated χ^2 for profitability for each sector over the study period. The chi square is obtained using the formula $\chi^2 = (O - E)^2 / E$. Where O is the Observed Frequency in each category E. E is the Expected Frequency in the corresponding category ij sum of_df is the "degree of freedom" (n-1) and χ^2 is Chi Square

Table 4, shows the results of the relationship between profitability and leverage using pooled OLS, fixed and random effects panel methods respectively. Comparing the results from the three methods, it is immediately obvious from the adjusted R^2 values that the fixed effects approach performs best.

Table 4: Effect of Leverage on Profitability

Dependent Variable	Pooled	Fixed	Random
Regression Model			
C	-30.76***	-45.06***	-33.88***
	-(6.41)	*-(2.89)*	*-(4.20)*
Siz	6.09***	8.31***	6.57***
	(8.24)	*(3.43)*	(5.29)
Lev	-0.04*	-0.03	-0.03*
	-(1.62)	*-(1.43)*	*-(1.54)*
R^2	0.108	0.451	0.049
Schwarz criterion	8.369	8.584	-
F statistic	35.602	6.436	15.331
Akaike criterion	8.347	8.081	-
D.W	1.166	1.884	1.686
No of Observation	593	593	593

The table shows the regression estimates of the equation: $Hit = \beta_0 + \beta_1 Lev_{it} + \beta_2 Siz_{it} + \varepsilon_{it}$ for the 66 firms over the period 1999-2007. Columns 2, 3 and 4 show the results for pooled, fixed and random effects respectively. The first figure in each cell is the regression coefficient. The second figure in parenthesis is the t-statistic.

In Table 4 the adjusted R^2 explains 11 and 5 percent of the variation under pooled OLS and random effects respectively. However, within a fixed effects framework, the models explanatory power increases to 45.1 percent. The coefficient of leverage is negative but only significant at 10 percent level in the pooled OLS result and 20 percent under fixed and random effect methods. This result shows that profitability decreases with leverage. Specifically, the coefficients of leverage in the three models show that a 10 percent increase in leverage reduces profitability by 0.3 to 0.4 per cent. The result suggests that firms maintained high debt ratio to increase their liquidity holdings thereby decreasing the likelihood of financial distress. Increased liquidity holding might have adversely affected firm profitability. One possible reason for this finding is the high interest rates and high cost of funds that prevailed in Nigeria during the period 1999-2007. This finding is consistent with several studies in developing countries. Such studies include Matarirano and Fatoki (2010), Fatoki (2006), Zou and Xiao (2006), Kahle and Shastri (2004), Raj and Sutthisit (2003), Rajan and Zingales' (1995), and Myers and Majluf (1984).

Gedajlovic et al. (2003) and Lincoln et al 1996 found that firms with higher level of debt earn less profitability.

In all models, the coefficient of firm size is positive. The result shows that a 10 per cent increase firm size leads to an 83 percent increase in profitability in the fixed effects model. We further introduce sales growth as additional control variable, the results obtained were not significantly different from those reported in Table 4. The coefficient of size was positive. The coefficient of leverage was negative while sales growth was positive as expected. In general, the results suggest that firms tend to enjoy economies of scale in production as they expand which possibly translates into higher profit.

CONCLUSION

This paper analyzed the profit profile of firms in Nigeria and examined the effect of leverage on firm profitability over the period 1999-2007. The study analysed secondary data on 66 purposively selected non-financial firms, obtained from the firm's Annual reports and Accounts and the Nigerian Stock Exchange Factbook over the study period. The data were analysed using chi-square, pooled ordinary Least Squares (OLS), fixed and random effects frameworks.

The results showed that aggregate profit levels for the firms, decreased at 0.02 percent yearly. However, disaggregating the firms into subsectors, the results show that while a few of the firms experienced downward trend in profitability over the study period, a few others actually witnessed increased profit levels during the study period. The results revealed that except for three sectors: chemical and paints, computer and office equipment and machinery/marketing, there was no significant difference between actual and trend values of profitability for the remaining sectors.

The results show that leverage was negatively related to profitability. This suggests that the use of debt by firms in Nigeria decreases profitability. This implies that firms will need to reduce their debt ratio to boost their profit level. Essentially, selection of debt as a source of capital finance should be in line with the costs and benefits associated with the use of debt. The results showed that firm size was a major determinant of profitability. This simply suggests that firms need to expand in size to enhance their profit level. In summary, firms will be able to enjoy large profit levels if they can increase in size and sales with a large reduction in debt ratio. This paper does not distinguished between short-term and long-term debt ratios and does not distinguished between small and large firms. These classifications might have some effects on the findings of the paper. Hence our future area of research is to analyse the impact of capital structure (long and short term) on firms' profitability taking cognisance of their sizes.

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