

# THE EFFECT OF CAPITAL STRUCTURE ON PROFITABILITY: AN EMPIRICAL ANALYSIS OF LISTED FIRMS IN NIGERIA

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## ABSTRACT

*This study investigates the influence of the capital structure on profitability of quoted companies in Nigeria. The study used secondary data from 1990 to 2004 collected from the selected Annual Report and Accounts of 50 non-financial quoted companies, and Fact Books published by the Nigerian Stock Exchange. The Pooled Ordinary Least Squares (OLS) model, Fixed Effect Model (FEM) and Random Effect Model (REM) were used in the analysis. The results indicate that profitability present a positive correlation with short-term debt and equity and an inverse correlation with long-term debt. Furthermore, the results show a negative association between the ratio of total debt to total assets and profitability. The result suggests that firms in Nigeria depend on external financing. In the Nigerian case, a high proportion (60%) of the debt is represented in short-term debt. The study suggests that companies should implement an effective and efficient credit policy, which will improve the performance level of the turnover and growth. Finally, the top echelon of company management should take interest in the issue of capital structure and constantly monitor its form and adaptability.*

**JEL:** G32

**KEYWORDS:** Pooled Ordinary Least Squares, Fixed Effect Model, Random Effect Model, capital structure, profitability

## INTRODUCTION

The corporate sector in the country is characterized by a large number of firms operating in a largely deregulated and increasingly competitive environment. Since 1987, financial liberalization has changed the operating environment of firms, by giving more flexibility to the Nigerian financial manager in choosing the capital structure of the firm.

The problem of how firms choose and adjust their strategic mix of securities has called for a great deal of attention and debate among corporate financial literature. The interest is due to the fact that the mix of funds (Leverage ratio) affects the cost and availability of capital and thus, firm's investment decisions. At the outset of such debate among other issues, is the question of the relevance of firm's strategic financing decisions for its own valuation. It requires that managers identify ways of funding new investment. Company financing decisions involve a wide range of policy issues.

Planning capital structure involves, to a great extent, the consideration of shareholders interest and other groups. Initially, at the time of its promotion, a company will have to plan its capital structure and subsequently, whenever funds have to be raised to finance investment, a capital structure decision is involved (Salawu, 2007). It is clear that capital structure is a significant management decision as it greatly influences the owner's equity return, his risks as well as the market value of the shares. It is therefore incumbent on the management of a company to develop an appropriate capital structure, which is most suitable to the company's operation.

Thus, financing policy, capital structure and firm ownership are all strongly linked in explaining how economic agents form and modify their asset-acquisition behaviour through firms and capital markets,

and thereby influence the ratio of their income and returns to asset holdings, whether in the form of direct remuneration, capital gains or dividend. A better understanding of the issues at hand requires a look at the concept of capital structure and its effect on firm profitability. With relatively little evidence available on the effect of capital structure on the profitability of the listed companies in Nigeria. This study attempts to examine the effect of capital structure on profitability of non-financial quoted firms in Nigeria in the context of the country's ongoing economic reforms.

The rest of the paper contains four sections. Section 2 provides literature review. Section 3 dealt with research methods while Section four presents the results. Concluding remarks follow in Section 5.

## **LITERATURE ON CAPITAL STRUCTURE AND PROFITABILITY**

Most of the empirical evidence on capital structure comes from studies of the determinants of corporate debt ratios e.g. Titma and Wessels (1988), Rajan and Zingales (1995), Graham (1996) and studies of issuing firms' debt vs. equity financing choice (e.g. Marsh (1982), Jalilvand and Harris (1984), Bayless and Chaplisky (1990), Mackie – Mason (1990), Jung, Kim and Stulz (1996). These studies have successfully identified firm characteristics such as size, R and D intensity, market-to-book ratio of assets, stock returns, asset tangibility, profitability and the marginal tax rate as important determinants of corporate financing choices. The effects associated with profitability and market-to-book ratio has been found to be especially important.

Modigliani and Miller (1958 and 1963) demonstrate that in a frictionless world, financial leverage is unrelated to firm value, but in a world with tax – deductible interest payments, firm value and capital structure are positively related. Other researchers have added imperfections, such as bankruptcy costs (Baxter, 1967; Stiglitz, 1972; Kraus and Litzenberger, 1973; and Kim, 1978), agency costs (Jensen and Mechling, 1976), and gains from leverage – induced tax shields (De Angdo ad Masulis, 1980), to the analysis and have maintained that an optional capital structure may exist. Empirical work by Bradley, Jarrell and Kim (1984), Long and Malitz (1985) and Titman and Wessells (1988) largely supports bankruptcy costs or agency costs as partial determinants of leverage and of optimal capital structure. Miller (1977) added personal taxes to the analysis and demonstrated that optimal debt usage occurs on a macro – level, but it does not exist at the firm level. Interest deductibility at the firm level is offset at the investor level.

Fama and French (2002) agree that the negative effects of profitability on leverage is consistent with the pecking order model, but also find that there is an offsetting response of leverage to changes in earnings, implying that the profitability effects are in part due to transitory changes in leverage rather than changes in the target.

Bancel and Mittoo (2002) in their study survey managers of firms in seventeen European countries on their capital structure choice and its determinants. Their preliminary analysis of the survey shows some interesting findings. Financial flexibility, credit rating and tax advantage of debt are the most important factors influencing the debt policy while the earnings per share dilution is the most important concern in issuing equity Evidence also supports that the level of interest rate and the share price are important considerations in selecting the timing of the debt and equity issues respectively. Finally, hedging considerations are the primary factors influencing the selection of the maturity of debt or when raising capital abroad.

Hovakimian, Hovakimian and Tehranian (2003) have successfully identified firm characteristics such as size, R and D intensity, market-to-book ratio of assets, stock returns, asset tangibility, profitability, and the marginal tax rate as important determinants of corporate financing choices. It was reported that high

market-to-book firms have low target debt ratios. On the other hand, consistent with market timing, high stock returns increase the probability of equity issuance, but have no effect on target leverage.

Drobetz and Fix (2003) tested the leverage predictions of the trade-off and pecking order models using Swiss data. According to them, the race between the trade-off theory and the pecking order theory is undecided; in fact, on many issues there is no conflict. In their study, firms with more investment opportunities apply less leverage, which supports both the trade-off model and a complex version of the pecking order model. Confirming the pecking order model but contradicting the trade-off model, more profitable firms use less leverage. Leverage is also closely related to tangibility of assets and the volatility of a firm's earnings. They also find that Swiss firms tend to maintain target leverage ratios.

Modigliani and Miller (1963) argue that, due to the tax deductibility of interest payments, companies may prefer debt to equity. This presupposes that highly profitable companies tend to have high level of debt. However, De Angelo and Masulis (1980) argue that interest tax shields may be unimportant to companies with other tax shields, such as depreciation.

In the trade-off theory, agency costs, taxes, and bankruptcy costs push more profitable firms toward higher book leverage. In the first place, expected bankruptcy costs decline when profitability increases. Second, the deductibility of corporate interest payments induces more profitable firms to finance with debt. In a trade-off theory framework, when firms are profitable, they prefer debt to benefit from the tax shield. In addition, if past profitability is a good proxy for future profitability, profitable firms can borrow more, as the likelihood of paying back the loans is greater. In the agency models of Jensen and Meckling (1976), Easterbook (1984), and Jensen (1986), higher leverage helps to control agency problems by forcing managers to pay out more of the firm's excess cash.

In sharp contrast, Myers and Majhif (1984) argued that as a result of asymmetric information (pecking order hypothesis), companies prefer internal sources of finance. In other words, higher profitability companies tend to have lower debt levels and higher retained earnings. Thus, a pecking order is established, whereby companies with high levels of profits tend to finance investments with retained earnings rather than by the raising of debt finance. Accordingly, the pecking-order model predicts a negative relationship between book leverage and profitability.

Again, the empirical evidence on the issue is mixed. For instance, Toy et. al., (1974); Kester (1986); Titman and Wessels (1988); Harris and Raviv (1991); Bennett and Donnelly (1993); Rajan and Zingales (1995), and Michaeles et. al. (1999); Booth et al. (2001); Bervan and Danbolt (2001) all find gearing to be negatively related to the level of profitability (supporting the pecking-order theory), while Jensen, Solberg and Zorn (1992) find a positive one (supporting the trade-off theory).

However, corporate studies in Nigeria have been clustered around estimation of corporate cost of capital (Akintola, Bello and Adedipe, 1983; Inanga, 1987 and Adelegan, 2001), determinants of dividend policy (Inanga, 1975,) and financing decision (Salami, 2000 and Adenikinju, 2001). Salawu, (2007) examined the considerable factors in deciding on the appropriate amount of equity and debt in the Nigerian banking industry, and the factors influencing banks' capital structure. His study revealed that ownership structure and management control, growth and opportunity, profitability, issuing cost, and tax economics associated with debt are the major factors influencing bank's capital structure.

## **DATA AND METHODOLOGY**

The study uses data of 50 non-financial companies listed on the Nigerian Stock Exchange for the period from 1990 to 2004. The companies with missing data and newly quoted companies were excluded from the study. The study also excludes the financial and securities sector companies, as their financial

characteristics and use of leverage are substantially different from other companies. In addition, the balance sheets of the firms in the financial sector (banks, insurance companies, and investments trust) have a significantly different structure from those of non-financial firms; therefore, financial firms were excluded from the sample. The secondary data for the study consist of selected variables from the financial statements of sampled firms.

The estimation model uses panel data. Panel data econometric techniques were employed for the study. The Pooled Ordinary Least Squares (OLS) model, Fixed Effect Model and Random Effect Model were used in the analysis, which covered the data from 1990 to 2004. The estimation equation is as follow:

$$\text{PROF} = f(\text{LEV1}, \text{LEV2}, \text{LEV3}, \text{PL})$$

Where:

PROF = Profitability

LEV1 = Total liabilities ratio

LEV2 = Long-term liabilities ratio

LEV3 = Short-term liabilities ratio

PL = Participation of Equity

Profitability is defined as earnings before interest and tax to the book value of total assets. Independent variables include total liabilities ratio, long-term debt ratio, short-term debt ratio and participation of equity. Total liabilities ratio refers to the total debt divided by total assets (LEV1), while long-term debt ratio is the ratio of long-term debt divided by total assets (LEV2). Short-term debt ratio (LEV3) is calculated as short-term debt divided by total assets. The equity (PL) is defined as the ratio of net assets to total debts.

## RESULT AND DISCUSSION

The choice among the ideal proportion of debt and equity can affect the value of the company, as much as the return rate can. This section reveals the analysis of the influence of the capital structure of Nigerian companies regarding the factor profitability. The results of the analysis of the regression estimated to evaluate the influence of the capital structure on the profitability are shown in Tables 1 and 2.

Table 1: Descriptive Statistics of Profitability and Capital Structure

VARIABLE	OBS.	MEAN	MEDIAN	STD. DEV.	MINIMUM	MAXIMUM
PROF	722	-0.3858	0.2030	12.781	-266.00	28.127
LEV 1	722	0.6572	0.6352	0.3695	0.0081	6.300
LEV 2	722	0.0829	0.0359	0.3733	0.0000	9.769
LEV 3	722	0.6003	0.5592	0.4879	0.0081	9.4938
PL	722	0.8389	0.5706	1.7048	-0.7441	41.6078

The data in Table 1 present the average indicators. The return rate (PROF) measured by the earning after interest and tax divided by net assets gives negative values, that is, -0.3858. This indicates that the companies showed poor performance in the analyzed period. The total liabilities (LEV1) on average

amount to about 65.72%. If total liabilities are split into long-term liabilities (repayable in more than one year) and short-term liabilities (repayable in less than one year), the figures 8.29% and 60% respectively, show that debt financing for firms in Nigeria corresponds mainly to a short-term nature.

The participation of equity in the financing of the companies measured by equity on total debts (PL) presents average of 0.8388 and standard deviation of 1.7047. The results suggest a certain uniformity of that capital source, that is, an elevated number of companies falls back mainly upon equity as a financing form. The values are quite high, that is, justified by the low long-term debt level.

Table 2: Regression Model Estimates: Profitability and Capital Structure Dependent Variable, Profitability (PROF)

Variable	OLS	Fixed Effect Result	Random Effect Result
Constant	0.3604 (0.3257)	0.5300 (0.4368)	0.3602 (0.3266)
LEV1	-1.2783 (-0.6701)	-2.0299 (-0.9604)	-1.2797 (-0.6734)
LEV2	0.0746 (0.0582)	-0.1346 (-0.1014)	0.0739 (0.0579)
LEV3	0.0409 (0.0291)	0.1739 (0.1169)	0.0411 (0.0293)
PL	0.0754 (0.2562)	0.0043 (1.2506)	0.0765 (0.2610)
Adjusted R <sup>2</sup>	0.0016	0.0775	-0.004
F – statistic	0.289 (0.885)	1.059 (0.365)	0.291 (0.884)
D-Watson Stat	2.0	2.0	2.2
Hausman Test	-	-	9.753 (0.0448)
Cross-section included	50	50	50
Number of observations	722	722	722

*Profitability (PROF) refers to earning after interest and tax/ net assets; long-term debt (LEV1) is defined as total debts/total assets, long-term debts (LEV2) refer to the ratio of long-term debts/total assets. Short-term debts (LEV3) is the current liabilities divided by total assets. The equity (PL) is defined as the ratio of net assets to total debts. Numbers in parentheses appearing below the coefficients are t-values. \*, \*\* and \*\*\* indicates coefficient is significant at the 1, 5 and 10 percent levels respectively. However, from the table above none of the variables are significance.*

Tables 2 present the results of the pooled OLS, fixed effects and random effects estimations for total debts (LEV1), long-term debts (LEV2) and short-term debts (LEV3). Moreover, the outcome of the Hausman’s specification test in the study rejects the hypothesis regarding the absence of correlation between the individual unobservable effects and the explanatory variables and, therefore, the choice should be the fixed effects. The Hausman test indicates that the fixed effect model should be used.

The LEV1 (total debts) has a negative sign of –1.2783, -2.0299 and –1.2797 under the three estimation techniques. The results indicate that the return rate (profitability) is inversely proportional to the debt. In other words, the larger the total debt, the lower is the profitability. This result is in conformity with the conclusions of Booth et al (2001), Fama and French (1998), Graham (2000) and miller (1977).

The short-term debts (LEV3) presented a positive sign with highest coefficient of 0.1739 under fixed effect model. This suggests that short-term debt is a common practice among the most profitable companies. This is due to the instability of the Nigerian economy, which necessitates the need of short-term funds to provide the necessary working capitals—which are the type of resources supposedly offered

with relative abundance and easiness by financial institutions. The participation of equity (PL) in the capital structure is positively correlated with profitability.

## CONCLUSION

This study investigates the relationship between capital structure and profitability of quoted companies on the Nigerian Stock Exchange during a fifteen years period. The result reveals that profitability has experienced a downward trend in growth with the average growth rate standing at a negative 38.58%. The disparity in profitability ranged from 28% maximum value for some firms to a loss of over 266% (minimum value) for others. This presents a great disparity between firms in profitability.

Moreover, the impact of capital structure on the profitability is not significant, but there is positive relationship between profitability and short-term debt. The result suggests that firms in Nigeria depend on external financing. In the Nigerian case, a high proportion (60%) of the debt is represented in short-term debt. The participation of equity (PL) in the capital structure is positively correlated with profitability.

More importantly, the result indicates that the Nigerian companies are using long-term debt in a extremely conservative way. This may be due to the high interest rates practiced at the Nigerian Financial Market, the instability of the exchange rate politics and remaining atmosphere of uncertainty of the economy. These factors convey operational and financial risks that hinder the managerial planning and inhibit the adoption of more sophisticated debt policy.

Thus, the results from this study have important implications for financial stability as higher ratios of short-term debt to total debt makes the corporate sector highly vulnerable to changes in economic conditions and may increase the economy wide impact of a financial crisis. Therefore, the following recommendation will assist the financial managers. One, the management should strive to identify the optimal capital structure of the firm and also maintain it since it represents the point where the market value of the firm is maximized. Two, the companies should implement an effective and efficient credit policy, which will improve the performance level of the turnover and growth. Finally, the top echelon of company management should take interest in the issue of capital structure and constantly monitor its form and adaptability.

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