Capital Structure, Competition and Firm Performance: Evidence from Nonfinancial Companies in Nigeria

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Abstract

This paper investigates the interaction between capital structure and firm competition on the performance of firms in Nigeria. The study uses two distinct measures of competition, the Herfindahl-Hirschman Index (HHI) and Boone indicator (BI), the impact of competition on leverage-performance relationship is examined. A panel of 63 Nigerian listed firms over the period 2001-2010 is used for the empirical analysis.The results indicate that financial leverage, used as a measure of capital structure, has significant positive effect on firm performance. It also reveals that product market competition in Nigeria enhances the performance effect of leverage.

Keywords Leverage, performance, Boone indicator, Herfindahl-Hirschman indicator

INTRODUCTION

The motivation for this study is to provide evidence on the interaction between leverage and firm performance in an emerging market setting in Africa, specifically on Nigerian firms. Since the seminal papers of Modigliani and Miller (1958, 1963) over five decades ago where the authors argued under certain assumptions that the value of a firm is unaffected by how that firm is financed, consensus have not been reached in both theoretical and empirical capital structure literature on the relationship between capital structure and firm performance. Following the Modigliani and Miller (MM) papers, the agency cost theory that followed relaxed some of the assumptions of the MM irrelevance theorem thus predicting positive relationship between capital structure and firm performance when debt is used as disciplinary device (Grossman and Hart, 1983; Jensen, 1986). However, negative relationship can occur when there is underinvestment due to interest payment commitment that can constrain cash flow to managers (Myers, 1977). The stakeholder

perspective of the agency cost theory also posited that negative relationship exist between capital structure and firm performance particularly when customers perceive the firm to be highly leverage as customers will be willing to transact with highly leverage firm provided they sell at low prices. The empirical studies that have tested these theories have provided mixed results and several empirical irregularities which thus make it difficult to reach a consensus on the capital structure performance nexus. Both the theoretical literature and empirical evidences failed to capture the role of product market competition on leverage and firm performance particularly how leverage create room for rivalry predation in concentrated product markets that can affect the performance. But an extension of these capital structure theories has been developed. It focused on how leverage create rooms for rivalry predation in concentrated product markets thereby conditioning the performance effect of leverage on the degree of competition in the product market (Chevalier and Scharfstein, 1996; Dasgupta and Titman, 1998).

The weak regulatory framework and poor institutional quality in Nigeria have tendency to promote very severe agency cost of equity. Similarly, it encourages highly concentrated and pyramid ownership structure as well as overly concentrated product market. Hence, this study is novel as it provides new insights on the interactions between capital structure, competition and firm performance from the perspective of Nigerian firms. This adds to country specific empirical evidences from Africa on capital structure, product market competition and firm performance nexus. Using panel data consisting of 63 firm level observations over the period of 2001 to 2010,this study seeks to address three important questions: (1) Does knowledge about product market competition improve our understanding-performance relationship in Nigeria? (2) To what extent does this relationship hold or vary across alternative measures of competition? (3) To what extent do the effects of leverage on performance and its interaction with competition depend on rival firm's leverage levels?

Furthermore, the contributions of this paper are into two folds: this paper represents the most recent attempt to investigate the interaction effect of leverage and product market competition on firm performance in a context like Nigeria that is characterised with highly predatory product market and severe agency cost of equity. To our knowledge, this issue has not been addressed in past studies from the Nigerian perspective using the non-structural behavioural approach; Boone indicator (BI) to measure product market competition as alternative measure to the Herfindahl-Hirschman Index (HHI) that is structural and popularly used by most studies.

The remainder of this paper is organized as follows. Relevant theoretical literature and empirical evidence and studies were reviewed in section 2.The theoretical framework and empirical model is presented in section 3. Section 4 presents the results and discussions. The last section concludes the study with summary and conclusion.

LITERATURE REVIEW

Models of capital structure that employ the features of the theory of industrial economics, particularly the structure-conduct-performance paradigm, have appeared in literature. The models are classified basically into two categories. One approach exploits the relationship between a firm's capital structure and strategy when competing in the product market. The other category addresses the relationship between a firm's capital structure and the characteristics of its product or inputs.

Traditional industrial economics literature has assumed that in choosing its competitive strategy the objective of the firm is to maximize total profits while finance literature on the hand has concentrated on maximization of equity value, both generally ignoring product market strategies. However, literature linking capital structure and product market strategy adopts the finance view that managers generally are motivated to maximize equity value as opposed to profits or total value. In these literatures, payoff to equity is changed by leverage and it thus affects the equilibrium product market strategies of firms.

The strategic product market variables considered are product price and quantity. These strategies are determined to affect the behaviour of rivals, and capital structure in turn affects the equilibrium strategies and payoffs. These models specifically focused on the effect of capital structure on the future availability of products, parts and service, product quality, and the bargaining game between management and suppliers. The models further show that oligopolists will tend to have more debt than monopolists or firms in competitive industries (Brander and Lewis, 1986). Oligopolists increase risk by a more aggressive output policy. Thus, to commit to pursuing a more aggressive strategy in a subsequent Cournot game, firms choose positive debt levels. These debts will tend to be long term. However, when tacit collusion is important, debt capacity is limited and debt capacity increases with the elasticity of demand (Makisimovic, 1988). For firms that produce products that are unique and firms for which reputation for producing high quality products is important, less debt may be expected (Titman, 1984), while highly unionized firms and firms whose workers have easily transferrable skills, they are expected to have more debt (Sarig, 1988).

Harris and Raviv (1991) further assert that models that are based on industrial organization considerations are seen to be potentially able to supply interesting results in empirical research. For instance, these models are capable of outlining more specifically the relationship between capital structure and observable industry characteristics such as demand and supply conditions and extent of competition. Also, other than price and quantity variables, the model is useful to explore the impact of capital structure on the choice of other strategic variables of the firm, which could include advertisement, research and development expenditure, plant capacity, location and product characteristics as well as inter-industry variations in capital structure.

Brander and Lewis (1986) was the pioneer to study the interaction between capital structure and market competition and firm performance. Theoretically, in a duopoly model, Brander and Lewis (1986) showed that leverage leads to

tougher competition due to limited liability effect. The strategic behavior of such aggressive competition could offset the associated agency costs problems. However, the effects of such strategic behavior on firms' profits are conditioned on the nature of competition and product characteristics of firms (Wanzenried, 2003). This suggests that the limited liability effect of debt could fail to boost the profitability of the leveraged firms and can lead to decrease in profit if competition is Cournot. The reason, according to Fosu (2013) is that limited liability induces a more aggressive production which leads to lower realized prices, with the decrease in profits higher and the more substitutable the products are. Predation theories and related literature suggest that leveraged firms could suffer a significant competitive disadvantage and prone to predation in concentrated product markets. This is possible because leverage firms are more financially constrained than their less leverage rivals in concentrated product markets. In addition, leverage firms have debt contract that create room for rivalry predation because the debt contract requires that they meet up with debt repayment at specified agreed period of time to the creditor. Failure to meet up with the debt obligation will lead to liquidation and their exit from the market. Leverage also impedes the firms from investing in market shares due to fear of default thus restrict their activities to the achievement of current period performance. They tend to charge higher prices particularly during recession (Bolton & Scharfstein, 1990; Chevalier & Scharfstein, 1996; Dasgupta & Titman, 1998; Fudenberg & Tirole, 1986).

However, as argued by Faure-Grimaud (2000) that the usual limited liability effect is offset by a negative one due to endogenous financial costs under asymmetric information. A powerful firm, by including less debt in its capital structure may exploit its output market power to secure favoured access to capital, and use that access to capital to consolidate its position in the market. Again, the management of a powerful firm by using less debt may be interested in superior profits and reduced risk associated with a conservative capital structure. All these possibilities would suggest a negative relationship between debt-ratio and concentration ratio.

Chevalier (1995) empirically investigated the effect of capital structure on product market competition of the US supermarket industry using the leverage buyouts as a natural experiment. He founds that when incumbents firms are highly leveraged, there is likelihood of entry and expansion of new firms and also that higher leverage softens product market competition. In another related study, Phillips (1995) examined the same issue in four industries and observed that in three of the four industries, higher leverage leads to softer competition and in the fourth one, high leverage leads to hard competition. His finding suggests that leverage has an adverse effect on a firm's investment and is positively associated with plant closure. Interestingly, they found that the significance of these effects depends highly on the capital structure and concentration interaction terms.

The results obtained by MacKay and Phillips (2005) revealed that most of the variations of capital structure arises within industry rather than between industry; and that leverage and the toughness of the product market

competition are inversely related. Moreover, they found that entrants usually use lower leverage than incumbent. Opler and Titman (1994) found that highly leveraged firms lose market share to their less leveraged counterparts during industry downturns with the lost market share severe in concentrated markets. Lyandres (2006) took a reduced-form approach to conclude that optimal leverage and the degree of competition in the product market is positively related. All the theoretical evidence and empirical results strongly suggest that capital structure and product market are strongly interrelated and that firms make interdependent financial and product market decisions. They also point to the disciplinary role of competition and reaffirm the role of leverage as a device that mitigates the agency problems such that the performance of firm can thus be enhanced.

Against this backdrop, this study examines the interaction between capital structure, product market competition and firm performance in Nigeria. This is the first attempt to the best of our knowledge to employ both structural and non-structural behavioral approach of measuring competition among non-financial firms in Nigeria (using both the Herfindahl-Hirschman Index and Boone Indicator). Majority of past studies in the literature have employed only structural measures of competition such as Herfindahl-Hirschman index (HHI) and the four firm concentration index. These structural measures indicated that higher product market concentration is as result of lower competition and lower product market concentration results from higher competition in the industry. On the contrary, Boone *et al*., (2005, 2007) is of the view that concentration may not be adequate measure of degree of competition. They posited that high concentration can occur due to strong competition among firms which pushes inefficient firms out of the market. Based on this argument, they developed the Boone indicator as an alternative measure of competition. The Boone indicator considers that competition improves the performance of efficient firms and weakens the performance of inefficient ones. Consequently, it is expected that for an industry with a high level of competition, an increase in marginal costs will lead to a drastic fall in variable profits.

Theoretical Framework and Methodology

The traditional theory of capital structure as posited by Miller and Modigliani set the direction for empirical research. Although their approach was deductive, having a range of assumptions has permitted their mathematical analysis to reach a lucid conclusion. Their conclusion was that capital structure did not affect the value of the firm, so any structure of capital adopted by any firm at any point in time is as good as any other. Relaxing some of the assumptions of M&M from their initial proposition in subsequent researches revealed that capital structure affects the performance of firms with the expected return on equity (performance) increasing linearly as the amount of debt increases, provided that the debt is risk free. However, if increased debt levels increase cost of debt, this also causes the rate of increase in the expected return on equity to decline. Hence, a baseline econometric equation on the impact of leverage (lev) on performance (per) is presented as:

$$Per = \alpha_0 + \alpha_1 Lev + \varepsilon \quad (1)$$

Various authors following the works of M&M have explored and modified the traditional capital structure by augmenting it with various control variables (Myers, 1976; Jensen & Meckling, 1976; Grossman & Hart, 1983; Jensen, 1986; Harris & Raviv, 1990; Ahmed, Abdullahi & Roslan, 2012; Fosu, 2013). These authors based their empirical studies on different theories of capital structure. Some of such theories include agency theory, information asymmetry theory, signalling theory, the trade-off theory, the pecking-order theory, product/input market interaction theory and the market-timing theory. Of all these reviewed theories, models that are based on industrial organization (product/input market interaction theory) considerations are seen to be potentially able to supply interesting results (Harris and Raviv, 1991). For instance, the models are capable of outlining more specifically the relationship between capital structure and observable industry characteristics such as demand and supply conditions and extent of competition. Also, other than price and quantity variables, the model is useful to explore the impact of capital structure on the choice of other strategic variables of the firm, which could include advertisement, research and development expenditure, plant capacity, location and product characteristics as well as inter-industry variations in capital structure. Thus, the above model is modified for this study to include measures of competition (Com) as well as some other determinants as found in capital structure literatures:

$$Per = \alpha_0 + \alpha_1 Lev + \alpha_2 Com + \psi Z + \varepsilon \quad (2)$$

Where α and ψ are parameters and Z is a vector of control variables.

Based on theoretical predictions, empirical arguments and findings and following this study objectives discussed in the introduction, this study formulates three testable hypotheses. The first hypothesis that leverage has a nonlinear positive effect on firm performance stems from the balance between agency costs of capital structure mix as emphasized by Jensen and Meckling (1976). Given the equity culture and agency problems associated with firms in developing countries, especially Nigeria, the regulatory environment within which the firms operate as well as the increased monitoring necessitated by debt-financing, leverage is expected to yield a positive effect on firm performance (Fosu, 2013). However, this effect is expected to decrease at very high levels of leverage given the likely debt overhang problems (Myers, 1977).

Furthermore, extant literatures have shown leverage leads to firms becoming more vulnerable to rivalry predation in concentrated and uncompetitive product markets (Bolton & Scharfstein, 1990; Campello, 2003, 2006, Chevalier, 1995a, 1995b, Chevalier & Scharfstein, 1996; Kovenock & Phillips, 1997; Opler & Titman, 1994) and given the emphasis by Brander and Lewis (1986) that the competitive disadvantage of leverage may only be

partially offset by the strategic benefits of leverage, it is therefore expected that the benefits of leverage could be improved by product market competition or reduced by market concentration. Hence, the second hypothesis derived from this assertion is that the agency benefits of leverage decrease (increase) with market concentration (competition).

Lastly, a composite hypothesis that the effects of leverage may be competitor-driven is formulated based on the arguments that predatory incentives enjoyed by firms may be driven by rival firms' leverage levels (Campello, 2003, 2006; Chevalier, 1995; Chevalier & Scharfstein, 1996; Fosu, 2013). The third hypothesis is therefore a related composite hypothesis that high relative-to-rival firms' leverage is associated with high firm performance which increases with product market competition.

Model and Data Source

In order to validate the research hypotheses discussed in the preceding section and to estimate the effect of leverage on firm performance, a baseline equation from the theoretical discussion is re-specified as:

$$Per = \alpha_0 + \alpha_1 Lev + \alpha_2 Com + \psi Z + \varepsilon \quad (2)$$

Going by the characteristics of the data requirement in terms of the scope and coverage, this equation is re-modelled in panel data form as:

$$Per_{i,t} = \alpha + \lambda_t + \mu_i + \beta_1 Lev_{i,t-1} + \beta_2 Com_{i,t} + \psi Z_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where Per is the performance of firm i at time t, measured using firm's return on asset, which is measured as the total operating profit plus depreciation and amortization divided by total assets; α is the constant term; λ_t is a set of time dummies controlling for macroeconomic events; μ_i represents firm-specific fixed effect; Lev is leverage of firm i at time t, measured in this study as the ratio of total debt and total assets; $Com_{i,t}$ measures the degree of competition of in industry j at time t, Z is the vector of control variables and $\varepsilon_{i,t}$ is the idiosyncratic error term.

The choice of control variables included in empirical studies varied by authors based on the focus of their specific studies. The control variables included in the model include: the squared term of lagged leverage which helps to take into account the possible nonlinear effect of leverage on performance as specified in the first research hypothesis. Other control variables include sales growth, firm size and mean earnings[1] and the use of lagged value of leverage in the model helps to address the possibility of reverse causality between leverage and performance.

[1] All variables and data sources are discussed in the data and variables definition section

Considering the important role played by market competition on firm leverage and performance relationship, the empirical model specified above is rewritten by including an interactive variable, which is the product of leverage and market competition measures. The new equation is given as:

$$Per_{i,t} = \propto + \mu_i + \beta_1 Lev_{i,t-1} + \beta_2 Com_{j,t} + \beta_3 (Lev_{i,t-1} \times Com_{j,t}) + \psi Z_{i,t} + \varepsilon_{i,t} \quad (4)$$

Where $Lev_{i,t-1} \times Com_{j,t}$, an interaction term defined as the product of lagged leverage of firm i in industry j at time t and competition in industry j at time t.

Furthermore, going by the possibility of non-monotonic effect of leverage on performance, all specifications is modified to include the squared term of leverage thereby we have the following model:

$$Per_{i,t} = \propto + \mu_i + \beta_1 Lev_{i,t-1} + \beta_2 Com_{j,t} + \beta_3 (Lev_{i,t-1} \times Com_{j,t}) + \beta_4 Lev^2_{i,t-1} + \psi Z_{i,t} + \varepsilon_{i,t} \quad (5)$$

Furthermore, as a verification of the assertion that leverage is driven by rivalry predation, the above equations (4 and 5) are estimated by replacing leverage in the explanatory variables with relative leverage. Relative leverage here is defined as firm's mean leverage which is simply the ratio of each firm's leverage to their industry's leverage. Hence, the model given in equations 4 and 5 respectively becomes:

$$Per_{i,t} = \propto + \mu_i + \beta_1 Rlev_{i,t-1} + \beta_2 Com_{j,t} + \beta_3 (Rlev_{i,t-1} \times Com_{j,t}) + \psi Z_{i,t} + \varepsilon_{i,t} \quad (6)$$

$$Per_{i,t} = \propto + \mu_i + \beta_1 Rlev_{i,t-1} + \beta_2 Com_{j,t} + \beta_3 (Rlev_{i,t-1} \times Com_{j,t}) + \beta_4 Rlev^2_{i,t-1} + \psi Z_{i,t} + \varepsilon_{i,t} \quad (7)$$

The two indices used to measure competition are the Herfindahl-Hirschman Index (HHI) and the Boone indicator (BI). Ideally, the calculation of the HHI should incorporate all the firms in the various industries in the economy. However, data unavailability generally restricts the number of firms in each industry used in empirical research to the corresponding numbers in the sample of interest. Hence, the actual values could be different from the 'strict' HHI. This notwithstanding, the estimated HHI should still be able to

capture the dynamics of competition (Fosu, 2013). The HHI is measured as the sum of squared market shares of each firm in a given industry (Beiner *et al.*, 2011). Mathematically:

$$HHI_{jt} = \sum_{i=1}^{Nj} \left(\frac{Sales_{ijt}}{\sum_{i}^{Nj} Sales_{ijt}} \right)^2 \quad (8)$$

Where HHI_{jt} is the HHI for industry j at time t; $Sales_{ijt}$ represents sales of firm i in industry j at time t. Higher values of the HHI indicate more concentration and less competitive markets (Fosu, 2013).

The Boone indicator considers that competition improves the performance of efficient firms and weakens the performance of inefficient ones. Consequently, it is expected that for an industry with a high level of competition, an increase in marginal costs will lead to a drastic fall in variable profits. The Boone indicator is estimated from the following regression equation:

$$ROA_{it} = \alpha + \beta_t InMC_{ij} + \varepsilon_{i,t} \quad (9)$$

Where ROA_{it} is the return on asset of firm i at time t, calculated as difference between sales revenue and costs of goods sold of firm i in industry j divided by its total assets. $InMC_{ij}$ is the natural logarithm of the marginal cost of firm i in industry j, approximated by cost of goods sold divided by sales revenue). β_t is the time-varying parameter and its absolute value measures competition (the Boone Indicator). The sign of the coefficients is expected to be negative and the higher its absolute value, the higher the level of competition in the industry.

The data requirement for this study is a panel data consisting of Nigerian firms listed on the floor of the Nigerian Stock Exchange (NSE) from the period of 2001 to 2010. This selection is guided by availability of data. Data were obtained from various sources which include annual financial reports and accounts of firms and the NSE Fact Book for various years. Every non-financial firm that has three or more consecutive years of observation was included in the sample selection. Firms from financial and equity sectors, including banks, insurance firms, equity investment, real estate and investment trusts, were excluded from the study sample. The motivation for the exclusion of this category of firms stem from their regulatory differences and structure as well as to ease the comparability of results.

Estimation Technique

All equations specified in the model specification are estimated using the panel data model estimation technique. Basically, static panel data models can be estimated using Pooled regression, Fixed Effects and Random effects. Each of the methods has their underlying assumptions which must be satisfied to obtain unbiased and efficient estimates.

The choice between fixed effects and random effects estimators continues to generate a hot debate among econometricians. Mundalk (1978) argued that the random effect model assumes exogeneity of all the regressors and the individual effects. In contrast, the fixed effect model allows for endogeneity of all the regressors and the individual effects. This *"all or nothing"* choice of correlation between the individual effects and the regressors prompted Hausman and Taylor (1981) to propose a model where some of the regressors are correlated with the individual effects. The resulting estimator is called the Hausman Taylor estimator and it is based upon an instrumental variable estimator which uses both the between and within variation of the strictly exogenous variables as instruments. More specifically, the individual means of the strictly exogenous regressors are used as instruments for the time invariant regressors that are correlated with the individual effects (Baltagi, 2001; Baltagi, Bresson & Pirotte, 2003).

RESULTS AND DISCUSSIONS

To choose between the fixed effects and random effects model, the Hausman specification test is carried out. The Hausman test compares fixed and random effect models under the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator (Hausman, 1978). The results of the Hausman specification test show statistically significance. Thus, indicating that the suitability of the fixed effects models as against the random effects model for each of the specified model. The fixed effects model is therefore carried out for each of the model and the result is included in Table 1.

Table 1 presents the estimation results of Equations 3, 4 and 5 specified in the previous section using the fixed effects estimation method. Models 1 to 4 in the table are alternative specifications in which the Herfindahl-Hirschman Index (HHI) is used as the inverse measure of competition. On the other hand, models 5 to 8, are the models using BI as the main measure of competition. Models 1, 2, 5 and 6 shows the baseline results obtained from the estimation of Equation 3. The results show that financial leverage has positive effects on firm performance.

Following the findings of Jensen and Meckling (1976), these results suggest that financial leverage mitigates the agency costs of external equity. Also, in line with the findings of Fosu (2013), with the use of conservative debt by Nigerian firms (similar to their South African counterparts), and their relatively higher use of equity finance, it is expected that the agency costs of equity will outweigh the agency costs of debt, making the agency benefits of debt much more realizable for publicly quoted firms. This finding is broadly consistent with the empirical evidence presented in Weill (2008) and Berger & Bonaccorsi di Patti (2006).

Furthermore, by controlling for the squared term of leverage as presented in equation 5, results in models 2 and 6 does not alter the results obtained

for the coefficient of financial leverage without the inclusion of the squared term. The coefficients of the squared term of leverage shows that they are statistically negative, implying that excessive levels of leverage may have an adverse effect on the performance of firm. However, given the magnitude of these coefficients, the overall effect of leverage on firm performance is positive. These findings provide support for the first hypothesis of the study that leverage has a significant effect on firms' performance in Nigeria.

On the effect of market competition on firm performance, the results show that competition do not have statistical significant impact on the performance of the firms, except for HHI in the model 2 after the inclusion of the squared term of leverage in the model. The results further show that the control variables are significantly related to the performance of firms. The coefficient of the firm size shows that it has a nonlinear and statistically significant relationship with firm performance. This result is consistent with the findings of Ghosh (2008) and Fosu (2013). This nonlinear relationship could imply that whilst the benefit of firm size (such as diversification and economies of scale) may help boost the performance of such firm, excessive expansion of firms may make moral hazard prevalent in the firm (Himmelberg *et al*., 1999). Similar to firm size, growth is found to also a positive relationship with performance. However, the result is not statistically significant. Expected return of the firms (MROA) also has a positive and significant relationship with the firm performance.

The estimation result for equation 4 wherein the interactive term of leverage and competition is included among the explanatory variables of the model is presented in models 3, 4, 7 and 8 with HHI used as the measure of competition in models 3 and 4, whilst BI was used in models 7 and 8. The estimation results slightly differ from what was obtained in the previous models. The effect of leverage maintains its positive and significant coefficient and the effect increases with product market competition. The leverage-competition interaction terms and the squared value of leverage are both not statistically significant when used jointly in the same model, even after the exclusion of the squared terms of leverage. Albeit, a joint test of statistical significance indicates that they are jointly significant.

The interaction term between leverage and the HHI measure of competition (model 4) as well BI measure (model 8) both shows positive coefficients with none of the two statistically significant. These findings suggest mixed results on the benefits of leverage on product market competition. When HHI is used as the measure of competition, the result shows a coefficient sign that is contrary to the negative sign expected a priori. This result suggests that using HHI as a measure of concentration, the benefits of leverage increases with concentration of firm contrary to the decrease expected, however the result is not statistically significant. On the other hand, the interaction term between BI and leverage shows a positive sign suggesting that the benefits of leverage increase with product market competition thus lending support for the second hypothesis that the agency benefits of leverage significantly increase with market competition of Nigerian firms.

Furthermore, these findings provide support for a number of theoretical predictions (models 1 to 8). Such studies include Bolton & Scharfstein (1990), Chevalier & Scharfstein, (1996) and Fosu (2013). These studies also provide evidence that suggest that increase in financial leverage is associated with predatory behaviour in concentrated product markets (Chevalier, 1995a, 1995b). Although, Opler and Titman (1994) and Kovenock and Phillips (1997) find a contrary result, that is direct negative effect of leverage on firm performance, the performance measures used in these studies differ from the one used in this study.

The results in table 2 seek to evaluate the third hypothesis of the study as well as to verify the possibility that the marginal effect of leverage on firm performance could be rival-driven. The estimation in the table is carried out by replacing the measure of leverage with the relative leverage which is a measure of the difference between a firm's leverage and the mean industry leverage (equations 6 and 7). This step further helps to check the robustness of the earlier results as well as to possibly corroborate the existence of predatory behaviour as outlined in previous studies (Chevalier and Scharfstein, 1996 and Bolton and Scharfstein, 1990).

Consistent with the findings obtained when leverage was used, the coefficients of relative leverage is positive and significant for both HHI and BI measures. These findings show that firms that are more leveraged than their rival enjoys higher performance which increases with product market competition. Further, contrary to the result obtained on the interaction term of leverage and HHI when leverage was considered in table 4 above, the interaction term with the use of relative leverage shows negative whilst that of BI maintains the positive signed coefficients. These findings suggest that the benefit of relative leverage increase (decrease) with product market competition (concentration). Therefore lending support for the third hypothesis of the study that high relative-to-rival firms' leverage is associated with high firm performance which increases (decreases) with product market competition (concentration).

CONCLUSION

The central objective of this study is to investigate the impact of capital structure (leverage) on the performance of Nigerian firms. The study further examines how this leverage-performance relationship is affected by market competition. Using a sample of 63 non-financial quoted firms between 2001 and 2010, the findings from the study indicated that competition is found to exert positive and in some cases significant effect on firm performance; Using the Herfindahl-Hirschman Index and Boone indicator as alternative measures of competition, it was found that firms in competitive industries benefit from leverage whilst those firms in uncompetitive industries are likely to suffer adverse effects of leverage; Accounting for the nonlinear relationship between leverage and performance, the findings as observed in is not substantially

altered; In addition, after examining the possibility of industrial rivalry effect on the results obtained through the substitution of leverage with the firm's relative to their industry leverage, the results did not alter but corroborate the findings that increase in financial leverage is associated with predatory behaviour in concentrated product markets.

Also, the findings from this study are similar to the one reported by Fosu (2013) where he conducted a similar study for a number of nonfinancial firms in South Africa. This implies that Nigeria shares a lot of similar characteristics with South Africa. Apart from being the second largest economy in Africa after South Africa, the country also features a highly concentrated and pyramidal ownership structure of firms, a less robust regulatory and legal environment as noted observed in South Africa (Fosu, 2013).

The policy implication of the findings of study is that competition is central to reduce the highly concentrated and pyramidal ownership structure of firms in Nigeria. Creating an effective competition law would go a long way to reduce the barrier to entry for new firms. This is one essential regulation that is not in place in Nigeria. Another important implication of this study is that firms in Nigeria need to employ more debt in the capital structure to enhance their performance particularly to protect the economic interest of minority shareholders who are usually exploited by majority shareholders managers. The use of debt would be more effective to mitigate the agency problem between them if the cost of debt is lower and this is possible if the institutional quality improves that can ensure those contracts are enforceable.

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Panel Estimation Result

Table 3 Performance-competition-leverage relationship

Dependent Variable: Return on Asset (ROA)
Sample: Cross Sections – 63 firms. Year - 2001 to 2010

	Herfindahl-Hirschman Index (HHI)				Boone Indicator (BI)			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Constant	-11.1561	-13.6215	-13.1398	-10.6956	-10.5147	-12.5402	-12.6817	-10.6021
	(4.6826)*	(5.1991)**	(4.8122)**	(4.3344)*	(4.3987)*	(4.8409)**	(4.8613)**	(4.4175)*
$Lev_{i,t-1}$	0.2695	0.2782	0.0234	0.0393	0.2679	0.2852	0.3349	0.3085
	(0.0959)**	(0.1016)**	(0.1316)	(0.1340)	(0.0944)**	(0.1037)**	(0.1410)*	(0.1295)*
$Size_{i,t}$	1.4117	1.7241	1.6685	1.3593	1.3500	1.6107	1.6284	1.3610
	(0.6086)*	(0.6749)*	(0.6288)**	(0.5679)*	(0.5759)*	(0.6346)*	(0.6370)*	(0.5782)*
$Size_{i,t}^2$	-0.0448	-0.0549	-0.0529	-0.0430	-0.0427	-0.0510	-0.0517	-0.0432
	(0.0197)*	(0.0219)*	(0.0204)**	(0.0184)*	(0.0186)*	(0.0205)*	(0.0206)*	(0.0187)*
$Growth_{i,t}$	0.0252	0.0425	0.0373	0.0246	0.0336	0.0477	0.0533	0.0372
	(0.0394)	(0.0487)	(0.0487)	(0.0394)	(0.0366)	(0.0457)	(0.0479)	(0.0377)
$MROA_{i,t}$	0.9628	0.9208	0.9242	0.9668	0.9577	0.9195	0.9148	0.9554
	(0.1840)**	(0.1882)**	(0.1778)**	(0.1747)**	(0.1797)**	(0.1862)**	(0.1872)**	(0.1805)**
$HHI_{i,t}$	0.4750	0.7585	0.3611	0.1116				
	(0.2572)	(0.3859)*	(0.3387)	(0.2175)				
$BI_{i,t}$					0.0210	0.0194	0.0096	0.0131
					(0.0110)	(0.0109)	(0.0169)	(0.0162)
$LEV_{i,t-1}^2$		-0.0111	-0.0055			-0.0107	-0.0103	
		(0.0104)	(0.0067)			(0.0103)	(0.0095)	

Continue... (Table 3)

$Lev_{i,t-1} * HHI_{i,t}$			0.9771	0.9090				
			(0.6986)	(0.7013)				
$Lev_{i,t-1} * BI_{i,t}$							0.0205	0.0166
							(0.0237)	(0.0230)
R-squared	0.7962	0.8075	0.8132	0.8017	0.7990	0.8091	0.8100	0.7996
N	567	504	504	567	567	504	504	567
Hausman Stat.	102.14*	95.26*	105.27*	113.14*	102.58*	43.43*	133.92*	112.00*

* Significance at 1%; ** significance at 5%;
Cluster and heteroscedasticity robust standard errors in parenthesis

Table 5 Performance-competition-relative leverage relationship

Dependent Variable: Return on Asset (ROA)
Sample: Cross Sections – 67 firms. Year - 2001 to 2010

	Herfindahl-Hirschman Index (HHI)				Boone Indicator (BI)			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Constant	-11.0352	-11.0448	-9.3679	-9.4020	-10.3946	-10.4085	-6.9770	-6.9824
	(4.6495)*	(4.6542)*	(3.4075)**	(3.4503)**	(4.3660)*	(4.3705)*	(2.4424)**	(2.4512)**
$RLEV_{i,t-1}$	0.2695	0.2499	0.3372	0.3202	0.2679	0.2453	0.3119	0.3078
	(0.0959)**	(0.1006)*	(0.1292)**	(0.1105)**	(0.0944)**	(0.0983)*	(0.0891)**	(0.0837)**
$Size_{i,t}$	1.4117	1.4135	1.2163	1.2208	1.3500	1.3522	0.9284	0.9292
	(0.6086)*	(0.6091)*	(0.4508)**	(0.4568)**	(0.5759)*	(0.5764)*	(0.3178)**	(0.3191)**
$Size_{i,t}^2$	-0.0448	-0.0449	-0.0391	-0.0393	-0.0427	-0.0428	-0.0301	-0.0301

Continue... (Table 5)

	(0.0197)*	(0.0197)*	(0.0148)**	(0.0150)**	(0.0186)*	(0.0186)*	(0.0102)**	(0.0102)**
$Growth_{i,t}$	0.0252	0.0257	0.0174	0.0179	0.0336	0.0341	0.0353	0.0354
	(0.0394)	(0.0394)	(0.0407)	(0.0405)	(0.0366)	(0.0366)	(0.0353)	(0.0352)
$MROA_{i,t}$	0.9628	0.9606	0.9277	0.9264	0.9577	0.9550	0.8353	0.8349
	(0.1840)**	(0.1852)**	(0.1752)**	(0.1755)**	(0.1797)**	(0.1809)**	(0.1656)**	(0.1654)**
$HHI_{i,t}$	0.4750	0.4710	0.3358	0.3347				
	(0.2572)	(0.2573)	(0.2478)	(0.2476)				
$BI_{i,t}$					0.0210	0.0210	0.0191	0.0191
					(0.0110)	(0.0110)	(0.0083)*	(0.0083)*
$RLEV^{2}_{i,t-1}$		0.0076	-0.0062			0.0087	-0.0016	
		(0.0236)	(0.0227)			(0.0239)	(0.0233)	
$RLEV_{i,t-1} * HHI_{i,t}$			-0.6918	-0.6809				
			(0.4193)	(0.4065)				
$RLEV_{i,t-1} * BI_{i,t}$							0.0766	0.0765
							(0.0251)**	(0.0251)**
R-squared	0.7962	0.7963	0.8066	0.8065	0.7990	0.7992	0.8357	0.8357
N	567	567	567	567	567	567	567	567

* Significance at 10%; ** significance at 5%
Cluster and heteroscedasticity robust standard errors in parenthesis