

A DYNAMIC PANEL MODEL OF CAPITAL STRUCTURE AND AGENCY COST IN NIGERIAN LISTED COMPANIES

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ABSTRACT

This study examines the impact of agency costs on capital structure of Nigeria listed companies for the period of 2000-2006. Using a dynamic panel model, the study demonstrates the extent to which asset utilization helps explain the financing structure of Nigerian firms. The main finding shows an inverse relationship between capital structure and agency costs of Nigerian firms. Thus, the negative coefficient on the agency cost variable indicates that, on average, the management of Nigerian firms chose either to use retained earnings or to issue new equity offer. Studies have shown that managers have a natural tendency to be cautious about borrowing, given that they have more to lose if the firm goes into liquidation, compared to shareholders with a diversified asset portfolio. Hence, a rise in the ratio of total sales to total assets (agency cost) would mean that the management team is efficient in using the company's assets to generate wealth for their shareholders.

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KEYWORDS: Capital Structure, Agency Costs, Nigeria

INTRODUCTION

In their paper, Modigliani and Miller (1958) showed the assumptions under which financing decisions do not affect the value of the company. They completely state which factors should influence financing decisions of companies. Financial theorist, for example, Sander (2007) has subdivided capital structure determinants into three layers. Layer 1 included fundamental factors such as *returns, risk, and value*. Layer 2 comprised classical theories including *tax, bankruptcy and agency costs* among others. Layer 3 included practical factors such as *legal regulation, the life cycle of a company, human psychology, market conditions, credit ratings, shareholder preferences and risk management consideration*. However, discussion in this paper will be concentrated on agency costs as it affects the financing decision of Nigerian companies. It is one of the important classical capital structure theories underpinning previous capital structure studies.

Despite its numerous challenges Nigerian economy display a futuristic prosperity and growth with concomitant high return on investment. Firstly, this study contributes to the present debate on the impact of agency costs on capital structure of Nigeria listed companies. Secondly, this is the first empirical analysis of capital and agency costs in Nigeria using advanced econometric models. Our major findings reveal that impact of agency costs theory on capital structure as found in the developed and emerging economies is relevant in Nigeria. Our result shows an inverse relationship between capital structure and agency cost i Nigeria. It indicates that companies with a higher debt to asset ratio have higher ratio of sales to assets. This is statistically significant at the conventional five per cent confidence level. This finding is consistent with Jensen (1986) theory that debt can reduce the agency costs of free cash flow by reducing the cash flow available to managers. It is also consistent with previous studies including. Li and Cui (2003) and Ang *et al* (2000). This paper is organised as follows. Section 2 reviewed relevant literature. Section 3 explains the data and methodology including the model specification and proxies. Section 4 presents the empirical results and discussion while section 5 provides the conclusion and recommendations.

REVIEW OF RELATED LITERATURE

Agency costs theory popularized by Jensen and Meckling (1976) and Myers (1984) suggests that the separation of ownership and control in a modern corporation may lead to array of conflicts from several sources. For instance, the separation of ownership from control in large public corporations may induce conflicts between creditors and the firm and between managers and shareholders. This may pitch the owners (principals) against the management (agents) given that managers as agents are not entitled to 100 per cent of the residual claims resulting from their professional responsibilities and expertise in running the affairs of the business. They, however, bear the entire costs of these activities and, in the event of financial distress or corporate takeovers, they will be the first in the firing line. It is assumed that faced with this situation, managers of corporations may therefore put less effort into value enhancement activities in the firm through sub-optimal investments.

Conflicts may also occur between creditors and shareholders, or between shareholders and other stakeholders such as customers, suppliers, employees, and competitors. As suggested by Myers (1993), conflict between shareholders and creditors may emerge as a result of underinvestment or overinvestment practices by the firm's management. For instance, conflict between existing shareholders and creditors could be magnified if future investment financed with debt yielded high returns (higher than the cost of debt). In this scenario, equity holders may benefit more from the profits generated by the firm since they are entitled to all the extra gains. However, if such investment failed completely, debt holders would suffer the losses given the limited liability clause of the equity holders. Either way, equity holders' benefit from investing in risky projects even if they are value decreasing since value decreasing investments may also reduce the value of debt. The loss in the value of equity from poor investments can be more than offset by the gains in equity value at the expense of the lenders. To protect themselves against expropriation lenders may impose certain restrictions (*protective covenants*) on the firm. Some of these covenants may include restrictions on the level of dividend paid to shareholders, the level of indebtedness in the firm and the disposal of a major asset. This may remain in force until all the debts are repaid and such restrictions could lead to sub-optimal performance of the firm.

Agency literature has focused on the role of debt as a means of disciplining managers. Grosseman and Hart (1982) were the first to argue that managers could pre-commit to work hard by using debt rather than equity. Similarly, Jensen's (1986) free cash flow theory considers additional debt as beneficial since the firm attempts to improve the productivity of its assets because of additional debt acquired. Debt not only reduces the free cash flow available to manager but also provides discipline to management through the debt market. Debt monitoring hypothesis is formalised by Harris and Raviv (1990) and Stulz (1990) and empirically demonstrated by Shleifer and Vishny (1997) provided extensive survey on the role of debt in reducing the conflict of interests between managers and shareholders. On the other hand, increased leverage also has costs. As leverage increases, the usual agency costs of debt rises, including bankruptcy cost (Jenson 1986). Myers (1977) pointed to the debt overhang problem where firms may forego good projects if they have significant debt outstanding. The reason is that for a firm facing financial distress, a large part of the returns to a good project go to bondholders. Therefore, in choosing their debt-equity level, firms should trade-off between the agency costs of debt and the agency costs of equity. By appropriately allocating refinance between equity and debt, capital structure can balance the conflicts between investors and management as well as that between management and creditors.

There are two previous studies that are more closely related to this. They are Li and Cui (2003) and, Ang *et al* (2000). In the first case, Li and Cui (2003), examine the impact of capital structure on agency costs in China using 211 non-financial listed firms for the period 1999-2003. They found that firms with high debt to assets ratio of annual sales to total assets also has high ratio of returns-on- equity. They also found a significant positive correlation between ownership concentration and the return-on-equity. On the other hand, Ang *et al* (2000) provided evidence on corporate ownership structure and agency costs measured in

terms of asset utilization and operating expenses. Ang, *et al* (2000) used data on small business in America to examine how agency costs vary with a firm's ownership structure. They find among others that agency costs are higher when an outsider rather than an insider manages the firm thus; agency costs are inversely related to the manager's ownership share.

Following the example of the three authors mentioned above, the level of agency costs, present in Nigerian companies is measured in terms of the asset utilization ratio, defined as total sales revenue divided by total assets. As suggested by Ang, *et al* (2000) and Singh and Wallace (2003), agency costs are inversely related to the asset utilization ratio. Therefore, the greater the proportion of a total firm's assets that is generated through sales, the more effective its management will be in directing assets to their most productive use. Thus, firms with higher asset utilization ratios are seen to be making optimal investment decisions and exerting sufficient effort to increase sales revenue. They are therefore subjected to lower asymmetric information and agency problems. Consequently, we anticipate a negative coefficient for our agency cost proxy.

DATA AND METHODOLOGY

Data Collection

In this paper, we have chosen to define corporate leverage as the book value of the total liabilities (i.e., the sum of short-, medium-, and long-term debts) divided by the book value of total assets. The outcome measures the percentage of funds provided by sources other than equity finance. The use of such a broad definition is in recognition of the fact that for many firms, especially those in emerging economies like Nigeria with underdeveloped capital markets, a combination of short and medium-term finance, including bank overdrafts and trade credits form the greater part of their funding requirements. Moreover, as noted by Chen (2003), the use of such book values helps avoid the limitations of missing information on the share of company stocks issued and openly traded on the stock exchange as well as on the gains in capital value arising from a dramatic rise in asset prices.

Thus, the use of the book value of total liabilities relative to total assets has since been recognized as the broadest definition of the leverage ratio as it captures all the percentage ratio of funds provided by the short- medium and long term borrowings of a firm. The data for our study were obtained directly from the Nigerian Stock Exchange, the Central Bank of Nigeria, and the Nigerian Securities and Exchange Commission. To check the authenticity of data, we compared it with those made available by some of the companies on their respective web sites. Further, we excluded firms with less than 8 years of continuous time series data on their total liabilities, total assets, and earnings before interest and tax between 2000 and 2006. We also dropped firms that were cross-listed on both the domestic and overseas exchanges.

This helped to avoid the confounding implications of disparities in economic structure, exchange rates, legislation, and the level of development of local and foreign markets. We note, however, that such omissions may bias our data set against larger companies to the extent that these firms are the ones that can afford to list on international stock markets. Nevertheless, we believe that the capital structures of cross-listed firms do not generally reflect the capacity of a typical Nigerian company to generate resources. The final sample of our study comprises seven annual observations for 94 companies, thus 658 observations. On the whole, they make up more than three-quarters of shares traded on the Lagos Exchange.

Data Description

Figure 1 depicts the trend in the mean of the percentage changes in the ratio of total debt to assets from 2000 to 2006 for our group of 94 firms. We note from Figure 1 the underlying trend in the year-on-year

changes in the total debt ratio for the overall sample, except in 2000 and 2002. The fall in the average gearing ratio of Nigerian firms is presumably related to the fact the first 2 years of the twenty-first century were a time when Nigeria signed an IMF agreement to receive debt-restructuring from the Paris Club and a \$1 billion credit from the IMF itself; both were allied to economic reforms (CIA Fact Book, 2010). From 2003 to 2005, the average leverage ratios for our overall sample firms rose persistently. The start of this period corresponds with the time when Nigeria pulled out of its IMF debt relief program after failing to meet its spending and exchange rate reform conditions. In addition, the Nigerian government and its banks borrowed heavily on the basis of rising commodity prices and export earnings.

Table 1: Leverage Ratio of Nigerian Listed Firms and Its Major Determinants: Descriptive Statistics from 2000-2006

<i>Item</i>	Mean	Standard Deviation	Min	Max	Correlation with the Leverage Ratio
1	Total liability percentage of total assets (leverage ratio)				
a	0.38	0.20	0.02	0.085	1.000
b	0.38	0.19	0.02	0.83	0.03
c	0.36	0.20	0.05	0.83	-0.05
d	0.36	0.19	0.07	0.80	-0.04
2	Standard deviation of earnings before interest and tax (business risk)				
a	0.16	0.10	0.08	1.90	0.15***
b	0.15	0.12	0.08	1.87	-0.10***
c	0.15	0.05	0.08	0.43	-0.06
d	0.16	0.09	0.11	1.13	-0.01
3	Total Sales percentage of total assets (agency costs)				
a	1.77	1.26	0.13	6.33	-0.16***
b	1.71	1.54	0.13	5.86	-0.08**
c	1.95	1.19	0.14	5.86	0.11***
d	1.98	1.25	0.25	6.12	0.11***
4	Total fixed assets percentage of total assets ratios (tangibility)				
a	0.57	0.19	0.09	0.93	0.04
b	0.56	0.19	0.08	0.92	-0.08**
c	0.56	0.20	0.10	0.93	-0.03
d	0.58	0.19	0.12	0.93	0.07*
5	Earnings before interest and tax percentage of total assets (Profitability)				
a	0.11	0.19	-0.82	0.88	-0.16***
b	0.13	0.21	-0.82	0.88	0.18***
c	0.17	0.19	-0.33	0.88	0.23***
d	0.12	0.19	-0.59	0.88	0.05
6	Log of total sale revenues in millions of Naira (size)				
a	7.38	1.95	1.44	11.36	-0.06
b	7.64	1.90	1.44	11.36	0.21***
c	8.46	1.45	3.55	11.37	0.44***
d	8.41	1.41	4.17	11.36	0.36***
7	Total assets annual percentage change (growth prospects)				
a	20.00	37.00	-72.21	214.16	-0.06
b	19.04	36.00	-572.20	214.16	0.02
c	20.31	35.04	-59.68	196.55	0.000
d	18.14	30.59	-59.68	176.41	0.02

*Manufacturing are firms officially classified as manufacturing by the United Nations International Standard Industrial Classification (ISIC). Foreign companies are firms having more than thirty per cent overseas share ownership and Old companies are those that are more than twenty-five years old. The numbers in bracket in column, 1 item 1 represent the numbers of our Nigerian listed firms in the manufacturing sector that have more than 30% of foreign ownership and aged 25 years old and above. *** Statistically significant at 1% confidence level, ** Statistically Significant at 5% confidence level, and* statistically significant at 10% confidence level.*

Thereafter, the leverage ratio for our overall sample declined, presumably because of a renewed determination to implement the market-oriented reforms aimed at modernizing the financial system, as well as restructuring and downsizing the public sector. Overall, descriptive statistics in items 2 and 3 of Appendix Table 1 show that, on average, the leverage ratio of a typical Nigerian company rose by 7.1% over the period 2000 to 2006. The features of a dynamic panel model of Nigerian firms in our data set are discussed in the next section.

Empirical Specification and Proxies

The existing theoretical literature does not provide definitive guidelines on how to determine a priori which functional form should be used when testing the relationship between corporate leverage and its major determinants including agency cost. But, given that this paper predicts an inverse relationship between agency cost and corporate leverage, we follow DeAngelo and Masulis (1980), Castanias (1983), in specifying a dynamic panel model function, which takes the general form outlined in Equation 1. Thus, the following equation was estimated to identify the determinants of leverage ratios of Nigerian listed companies.

$$Y_{it} = \mu + \alpha[D_{it}] + \beta[ACOT_{it}] + \gamma[X_{it}] + \varepsilon_{it} - \varepsilon_{it-1} \tag{1}$$

where Y_{it} is the dependent variable, which is defined as the year-on-year change in the natural logarithm of the ratio of the book value of total leverage to the book value of total assets. Such differencing helps to address the problem of nonstationarity in data (Asteriou & Hall, 2007; Mukherjee, White, & Wuyts, 1998). The sub index i refers to individual companies; t refers to the business year, and ε_{it} is the white noise error term. The parameter coefficient is the overall constant term. It equates to the mean of the percentage change in the total debt ratio for our typical Nigerian firm where the values of all the determinants in our model remain unchanged.

The symbol D_{it} is a vector comprising data on the changes in the total debt ratio lagged one period ($DLLEV_{it-1}$), two periods ($DLLEV_{it-2}$), three periods ($DLLEV_{it-3}$), and four periods ($DLLEV_{it-4}$). Examples of previous empirical studies to incorporate the effect of debt levels of preceding periods on current borrowing decisions are found in De Miguel and Pindado (2001), Ozkan (2001), and Frank and Goyal (2004). In these models, the relationship between the actual debt ratio in the current and previous periods is measured by the sum of the statistically significant alpha coefficients α , expected to range between 0 and 1. The sign ACOT is used to proxy for agency costs measured by ratio of total sales to total assets, given the limited financial information of our sample.

As mentioned earlier, the computation is consistent with the assets utilization principle. For instance, a higher ratio of total sales to total assets means higher operational efficiency. This also relates to superior revenue and less income variability, which may lead to greater borrowing capacity. It therefore follows that the higher the total asset turnover ratio, the higher the basic earnings power of the company with associated increase in profitability before interest and tax. Consequently, a high ratio of asset utilization means that the management team of our ninety four listed firms is effective in overseeing its trading operations with related increase in free cash flow. We may therefore infer that firms with high asset turnover ratios are able to meet their debt obligations to creditors ‘other things being equal’.

Control Variables

In choosing the extra variables, we focus primarily on those factors whose correlations with the capital structure choices of firms within a country have been shown to be robust and statistically significant regardless of time period and method of analysis. They are business risk, profitability, asset tangibility, company size and its growth prospects.

The symbol X_{it} is a $(K \times 1)$ dimensional vector containing observations on the control variables to be added concurrently. The majority of empirical studies on capital structure recommend the inclusion of additional variables that capture the leverage effect of a host of firm characteristics. Nevertheless, because of a lack of data, we have limited our choice of these extra variables to (a) business risk (b) profitability, (c) tangibility, (d) growth opportunities, and (e) size expressed in terms of the first difference of their natural logarithm. The term $SDEV_{it}$ is the measure of business risk, which was calculated as the standard

deviation of the ratio of operating income to total assets. Such earnings volatility aggravates the problems of asymmetric information between insiders and external debt providers in particular, persuading profitable firms to use internally generated cash flows and equity over debt as a source of finance. Consequently, business risk will be inversely related to the leverage ratio. We anticipate that the β coefficient will have a negative sign (i.e., $\beta < 0$).

Profitability, PRF_{it} , is calculated as earnings before depreciation, interest, and tax (EBDIT) divided by total assets. According to the Myers-Majluf (1984) pecking order theory, firms generating profits will finance their investment first from retained earnings because of asymmetric information costs. The decision to use external finance, equity in particular, is made only as a final resort. Thus, a negative relationship between profitability and gearing is expected. However, a positive correlation is also supported by the static trade-off, agency cost, and cash flow hypotheses. These models predict that a firm with a high profit may opt for debt in order to take advantage of tax shields. Besides, a firm may issue debt to the extent that its internal controls are ineffective in preventing managers from undertaking investments with a possible negative net present value.

Tangibility, TAN_{it} , is the ratio of the book value of total fixed assets to total assets. Thus, a high tangible fixed asset ratio indicates that the firm has already committed considerable sums of money into past investment projects that can easily be controlled and accessed by investors. Consequently, creditors generally demand higher tangible asset proportions when providing finance for new projects. We would therefore expect a positive relationship between tangibility and gearing.

The growth opportunity of a firm, $GRWP_{it}$, is approximated as the percentage change in the natural logarithm of the book value of total assets in millions of local currency. The pecking order theory postulates that firms with bright growth outlook tend to maintain relatively low debt ratios. Such allows them to create the borrowing reserve capacity needed to avoid potential problems of underinvestment. Consequently, a high growth in total assets during normal trading periods signals a lack of potential growth opportunities, which may lead firms with free cash flows to overinvest in unproductive assets such as excessively fancy office space, office furnishing, automobiles, private jets, and other executive perquisites. As postulated by the free cash flow theory, one manifestation of the overinvestment problem is that firms will issue debt, which commits management to fixed interest payments and the discipline that goes with it (Arnold, 2008). Thus, a positive relationship will likely exist between our total asset growth variable and debt. The size of a firm $SIZE_{it}$ is calculated as the natural logarithm of total sales revenue in millions of local currency. It is expected that debt is positively influenced by size due to the fact that larger firms have more diversified activities. They therefore have lower financial distress costs and are less likely to go bankrupt. Besides, larger companies tend to publish more accurate and timely information. The consequent reduction in agency and asymmetric information costs is usually reflected in lower interest rates and higher debt ratios.

Items 4 to 7 of Appendix Table 1 present the statistics for the control variables used in our empirical estimation. As presented earlier, the information reported is for the overall group of 94 firms from 2000 to 2006. However, unlike in this earlier section, these results are obtained from an “unbalanced panel” in the sense that there is an unequal number of annual time-series data for individual firms. Such may bias our results in favour of those variables with more observations. Nonetheless, our results are derived from a dataset comprising 363 observations for our overall sample of firms. They show that, on average, profitability, measured in terms of either return on total assets or an asset utilization ratio, declined by at least 10% a year. Nevertheless, despite the reduction in operational efficiency, Nigerian firms raised their investment in fixed tangible assets by roughly 10% per annum during this period. Table 2 presents contemporaneous pairwise correlation coefficients for all the variables in our overall sample data set.

Table 2: Pairwise Correlation Matrix for Leverage and Its Determinants

Variables	Dllev	Sdev	Dacot	Dlprf	Dltan	Grw	Dsls
Sdev	-0.061 [-1.332]	1.000 [-]					
Dacot	-0.019 [0.414]	0.077 [1.681]	1.000 [-]				
Dprof	-0.005 [0.103]	0.039 [0.854]	-0.11 [0.245]	1.000 [-]			
Dtan	0.236 [5.254]	-0.013 [0.290]	-0.008 [0.177]	0.039 [0.853]	1.000 [-]		
Grw	0.198 [4.375]	-0.076 [1.660]	-0.282 [6.361]	-0.026 [0.556]	0.231 [5.165]	1.000 [-]	
Dsls	-0.026 [0.564]	0.060 [1.306]	0.260 [5.825]	0.011 [0.233]	0.030 [0.652]	0.025 [0.550]	1.000 [-]

This table shows the pairwise correlation matrix.

Expected relationships that are evident include statistically significant positive correlation between debt ratio changes and the tangibility, growth opportunities, and size variables. As expected, a rise in the asset utilization ratio (the proxy for agency costs) is inversely related to leverage, albeit at a 12% confidence level. Other interesting correlations observed include the association between current and prior debt ratios. The sum of the significant coefficients on the second and fourth lags is 0.05, suggesting a disequilibrium correction rate of 94% a year. Nigerian firms, it seems, were very quick to adjust their actual debt level to the target ratio. This evidence is consistent with predictions of adjustment models comprising firms with low transaction costs.

The coefficients μ , α , β , and γ are the parameters to be estimated. We have used the dynamic panel data models proposed by Mukherjee et al. (1998) and Attanasio, Picci, and Scorcu (2000). These authors recommended the use of a generalized method of moments (GMM) instrumental variable (IV) estimator when some of the explanatory variables are correlated with the error terms and there are no cross-equation restrictions on the parameters in the model. We use the GMM-IV model proposed by Arellano and Bond (1991) after a Wu-Hausman test for endogeneity revealed that some of the right-side variables, such as profitability, agency costs, and firm size, are simultaneously determined with the debt ratio. To improve model efficiency, we used the natural logarithm of all the regressors in Equation 1 at level lagged 2 years as instruments (Nwachukwu, 2009) see also Nwachukwu and Mohammed (2012). To check for potential misspecification of the GMMIV model, previous researchers have normally reported two diagnostic test statistics. The first test is the $M1$ and $M2$ statistics, which verify for a lack of first and second-order serial correlation in the differenced residuals in that order. In a valid model, the test for the null hypothesis of the absence of a first-order serial correlation ($m2$) is not rejected.

By contrast, a test for a lack of a second-order serial correction is always rejected. Together, these results indicate the error terms in the original model at level are not serially correlated (De Miguel & Pindado, 2001). The second test is the Sargan statistic, which checks for over-identifying restrictions in the model. This statistic is asymptotically distributed as a chi-square under the null hypothesis that the instruments are uncorrelated with the first-difference residuals. The next section presents the results of Equation 1 as estimated using the GMM-IV application in EVIEWS version 6. We adopt a stepwise approach beginning with the assumption that leverage and business risk form a simple two-variable system without the need to control for other additional factors. We then add jointly the five control variables described earlier. Evidence from the pairwise correlation coefficient between these independent variables in Appendix Table 2 suggests that potential multicollinearity problems are minimal.

RESULTS AND DISCUSSION

Generalized Method of Moments – Instrumental variable (GMM-IV) estimates were obtained from our unbalanced panel of 94 listed firms from 2000 to 2006. The results are presented in Table 3 and our

argument here is conducted under (a) a simple two-variable empirical model and (b) a simple multivariate empirical model. The statistically negative coefficient for the agency costs proxy of roughly -0.24 is robust to linear and nonlinear specifications. A number of previous studies, notably Rajan and Zingales (1995) and Gatchev, Spindt, and Tarhan (2008), showed a similar inverse relationship, even though they used different proxies for agency costs. As we said earlier, a rise in the ratio of total sales to total assets (used as a substitute for lower perceived agency problems) would mean that the management team was efficient in using company assets to generate wealth for shareholders.

Table 3: Estimation of Our Capital Structure Model

Column 1	Column 2	Column 3	Column 4
Estimation method	DLLEV	GMM-IV	GMM-IV REG 3
Dependent variable (y)	Mean	REG 2	
Independent(x) variables			
DLLEVL1	0.13%	<i>-0.146**</i>	<i>-0.078**</i>
		[-5.208]	[-2.581]
DLLEVL4	0.15%	0.047	<i>0.250**</i>
		[1.090]	[5.150]
SDEV	0.15%	<i>1.121**</i>	<i>-0.852</i>
		[4.579]	[-22.237]
DLACOT	0.08%	<i>-0.271**</i>	<i>-0.241</i>
		[-5.972]	[-4.374]
DLPRF	-0.30%	<i>-0.095**</i>	<i>-0.208**</i>
		[-5.159]	[-37.469]
DLTAN	0.08%	<i>0.104**</i>	<i>0.066**</i>
		[2.567]	[4.409]
GRW	19.79%	<i>0.003**</i>	0.002
		[2.027]	[0.974]
DSLS	0.11%	<i>-0.288**</i>	-0.113
		[-4.574]	[-1.139]
Marginal Impact on Leverage		<i>1.121</i>	<i>9.938</i>
Model fit and diagnostic test statistics			
Wu Hausman (F-statistics)		3.85	3.85
Wu-Hausman- F-statistics (Prob Value)		0.001	0.001
m2 test		0.398	0.327
Wald test		0.001	0.001
Sargan test		0.87	0.87
Adj R ²		0.18	0.67

Mean of dependent variable 37.75%, Standard deviation of dependent variable 19.70%, Number of observations 609

This table shows the regression estimates of equation 1, Capital Structure $(Y_t) = \mu + \alpha[D_{it}] + \beta[Agency Cost_{it}] + \gamma[X_{it}] + \varepsilon_{it} - \varepsilon_{it-1}$. Table 1 above shows the results for the 94 firms listed on the Nigerian stock Exchange for the period o 2000 -2006. The estimated coefficients in bold italics are the t-statistics (*, ** and *** indicate significance at 10, 5 and 1 per cent levels respectively. The values are the coefficients and the figures in brackets [...] are the t-statistics unless otherwise stated. The instrumental sets includes the lagged values of all the right-hand side variables dated $t = 4$. The m2 tests are for second-order AR (2) serial correlation in the differential residuals equation under the null hypothesis of no serial correlation. The test is asymptotically distributed as $N(0, 1)$. The formal Wald tests reject the null that the original idiosyncratic errors are serially uncorrelated. These are obtained using Eviews 'view-coefficients test-Wald -coefficients restriction and entering the restriction C (1) =-0.5 in the edit box'. The Sargan test is used to test the over-identifying restriction and is asymptotically distributed as $\chi^2(p-k)$ under the null of instrument validity. (k is the number of estimated coefficients and p is the instrumental rank). The Sargan tests for the three models in column, 2, 4 and 4 are not significantly different from zero. This implies that the null hypothesis that our instrumental variables are valid cannot be rejected at the conventional 5% confidence level.

The negative coefficient on the agency cost proxy indicates that, on average, firms chose to finance through a relatively cheaper new stock offering. The agency cost variable negative coefficient indicates that, on average, management of the firms in our sample chose to use either retained earnings or to issue new equity offer. It has also been argued that managers have a natural tendency to be cautious about borrowing, given they have more to lose if the firm goes into liquidation, compared to shareholders with a diversified asset portfolio. A number of previous studies on determinants of capital structure including the papers by Titman and Wessels (1988), Rajan and Zingales (1995), Akhtar (2005) and Gatchev *et al.*(2009) obtained a similar inverse relationship between leverage and agency costs. In explaining the relationship between leverage and agency costs, the previous studies mentioned above suggested that a rise in the ratio of total sales to total assets (used as our measure of agency cost) would mean that the management team is efficient in using the company's assets to generate wealth for shareholders. As a result, providers of capital, particularly debt holders, would have little or no reason to restrict the firm's

operating freedom and investment flexibility by building complex covenants into loan agreements. The lower agency cost is passed on in the form of a lower premium required by debt and equity holders.

The other coefficient estimates that are significantly different from 0 are for those firm-specific attributes representing (a) previous debt ratios, (b) total operating profit, (c) agency costs, and (d) asset tangibility. The coefficient of the debt ratio observed in the previous year $t-1$ (DLLEV $t-1$) shows a significant negative value of -0.08 . From the static trade-off theory, this negative correlation indicates that the percentage changes in the debt ratio in the preceding year say 2005, were considered to be excessively high, prompting our average firm to reduce the proportions of borrowing in total assets in the following year. By contrast, changes in debt ratios observed 4 years earlier in 2002 were probably deemed to be lower than the target level, persuading firms to raise their borrowing ratios over the subsequent 4 years by an average of 0.25% per annum for every 1% deviation from the overall sample mean leverage.

The sum of the coefficients on the lagged debt variables is 0.15, which suggests an adjustment factor of 0.85. This means that it would take roughly 1 year 2 months i.e. $1 \text{ year } 0.85 \frac{1}{4} 1:18$ years for our average firm operating under the same management and market conditions that existed between 2000 and 2006 to return to its target debt ratio once it has deviated from it. The negative coefficient estimate of -0.21 for the profitability variable is consistent with the observation of the conventional Myers-Majluf pecking order theory that profitable firms often borrow very little. They prefer instead to finance potentially beneficial investments with retained earnings that are without transaction and administrative costs. The coefficient estimate on the asset tangibility variable bears the expected significant positive sign, although the magnitude of between 0.07 and 0.10 varied with whether the leverage model was deemed to be nonlinear or linear. However, we should point out that the size of our estimated slope coefficient for asset tangibility is much lower than the positive figure of between 0.22 and 0.27 normally reported in previous empirical studies. The lower asset tangibility effect on debt ratio annual changes observed for our group of Nigerian listed firms is probably due to the country's ineffective legal system.

CONCLUSION

There have been many studies conducted concerning agency costs in the developed and emerging markets, yet no research focussed on undeveloped economies including Nigeria. Despite its numerous challenges, Nigeria exhibit economic prosperity and growth with concomitance high return on investment. Firstly, this study contributes to the present debate on the impact of agency costs on capital structure of Nigeria listed companies. Secondly, this the first empirical analysis of capital and agency costs in Nigeria using advanced econometric models. Our major findings reveal that impact of agency costs theory on capital structure as found in the developed and emerging economies is relevant in Nigeria. Our result shows an inverse relationship between capital structure and agency cost i Nigeria. It indicates that companies with a higher debt to asset ratio have higher ratio of sales to assets. This is statistically significant at the conventional five per cent confidence level. This finding is consistent with Jenson (1986) theory that debt can reduce the agency costs of free cash flow by reducing the cash flow available to managers. It is also consistent with previous studies including Li and Cui (2003), and Ang *et al* (2000).

Given this result and challenges of the Nigerian capital market and the economy in general, we make the following recommendation. *First*, the government needs to implement policies aimed at increasing the depth and efficiency of the market so as to “correctly” price shares. Such market-orientated reforms involve initiatives which will encourage a greater openness and private sector participation in the economy. Then too, policies should be introduced to automate trading on the stock exchange as well as to educate all registered asset managers on the linkages between risk and expected returns. Moreover, agency costs arising from the conflicts of interest between managers and external providers of finance can be mitigated by setting up regulatory bodies with legal powers to enforce the rights of investors. Additionally, an independent arbitration agency should be set up to settle disputes between firms and their

employees, together with an ombudsman who deals with complaints by customers, suppliers and other companies. Furthermore, regulations that ensure that firms publish timely and accurate information in their accounts, as well as the provision of competent and trusted auditors, will help reduce the potential costs of financial distress for external investors.

Second, policies, which create an appropriate enabling macroeconomic environment, will help our firms identify and invest in profitable long-term projects and hence increase the potential market value of their assets. To this end, the Government should persist with the implementation of appropriate fiscal and monetary policies allied to the debt-restructuring programme originally agreed with the IMF in 2002. Such budgetary adjustments may relate to the de-regulation of prices as well as privatization and cuts in public enterprise subsidies. Monetary reforms that will enhance the capacity of Nigerian firms to generate higher profits will include those aimed at lowering high inflationary pressures, the appreciation of real exchange rates and the reduction of inefficiency within the banking sector.

Appendix A: Definitions of Variables Used in the Study

<i>LLEV</i>	the total leverage ratio. this is calculated as the ratio of total liabilities to total assets
<i>DLLEV_{t-1}</i>	percentage change in the natural logarithm of the total leverage ratio lagged one year, t-1
<i>DLLEV_{t-2}</i>	percentage change in the natural logarithm of the total leverage ratio lagged two years, t-2
<i>DLLEV_{t-3}</i>	percentage change in the natural logarithm of the total leverage ratio lagged three years, t-3
<i>DLLEV_{t-4}</i>	percentage change in the natural logarithm of the total leverage ratio lagged four years, t-4
<i>SDEV</i>	the standard deviation of the ratio of earnings before depreciation, interest and tax to total assets. an increase in this variable denotes a worsening in earning volatility (i.e, business risk)
<i>SDEV_{t-1}</i>	the standard deviation of the ratio of earnings before depreciation, interest and tax to total assets lagged one year, t-1
<i>SDEV_{t-2}</i>	the standard deviation of the ratio of earnings before depreciation, interest and tax to total assets lagged two years, t-2
<i>SDEV_{t-3}</i>	the standard deviation of the ratio of earnings before depreciation, interest and tax to total assets lagged three years, t-3
<i>SDEV_{t-4}</i>	the standard deviation of the ratio of earnings before depreciation, interest and tax to total assets lagged four years, t-4
<i>SDEV²</i>	the square of the standard deviation of the ratio of earnings before depreciation, interest and tax to total assets
<i>AGENCY COSTS</i>	the ratio of earnings before depreciation, interest and tax (EBDIT) to total assets
<i>PROFITABILITY</i>	the ratio of total fixed assets to total assets
<i>TANGIBILITY</i>	percentage change in the natural logarithm of total assets in millions of Nigerian naira
<i>GROWTH</i>	natural logarithm of total sales revenue in millions of Nigerian naira
<i>SIZE</i>	

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