Capital Structure and Post-privatization Value of Firms: Evidence from the Nigerian Stock Exchange

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Abstract
This study examined the impact of capital structure on the value (profitability) of privatized firms listed in the Nigerian Stock Exchange and determined their optimal capital structure. A panel data obtained from the Nigerian Stock Exchange and Securities and Exchange Commission during the period 2002-2009 was used for the study. The results of the OLS regression suggested a significant positive linear relationship between firm value and the capital structure measured by the ratio of total debt to total assets of the firm. There was also an evidence of positive linear relationship between firm value and company income tax as well as stock market development. Our results further showed that inflation and management restructuring dummy have a negative linear relationship with firm value. After controlling for a squared term of debt financing, the result suggested that corporate financing through debt tended to increase post-privatization value of firms up to a given level, after which any addition to the proportion of debt in the capital of the firms reduced their value. Furthermore, taking the second derivative of firm value, it is evident that the optimal capital structure of the firms that have been privatized and quoted in the Nigerian Stock Exchange is about 34.3%, 32.4% and 38.3% for Return on Sales, Return on Assets and Return on Equity. The study therefore recommended among others the need for all the privatized firms quoted in the Nigerian Stock Exchange to maintain optimum capital structure so as to enhance unprecedented increase in their post-privatization performance.

Keywords: Capital structure, Firm value, Irrelevant Theorem, Post-privatization, Nigerian Stock Exchange

1. Introduction
Prior to Nigeria's political independence in 1960, the State owned Enterprises (SOEs) were set up basically to provide social and economic services to the general public. However, the outcome of these enterprises as a catalyst for economic growth and development has proved insufficient in dealing with the fundamental problems confronting the economy; hence economic and social indicators continue to deteriorate. The economy remains prostrate and the numerous economic problems remain intractable. As CBN (2003) noted, these State-owned enterprises became drain pipes for public funds and instruments for exerting much pressure on government expenditures and for exacerbating fiscal deficits. This reflects a judgment that the economic regulation cum public ownership of enterprises are no longer optimal and that some of the activities carried out in the public sector may be effectively managed and controlled by the private sector. Like other African countries, Nigeria had to introduce an elaborate policy of privatization and commercialization in 1988, as an integral part of the Structural Adjustment Programme (SAP) which started in 1986. The core objective of the programme was to resolve the fiscal imbalance in the light of the inflationary impact of excessive budget deficits of which the public enterprises constituted a major cause (Udeaja, 2000, 2006).

It is against this background that this study sets out to quantitatively examine the impact of capital structure vis-à-vis debt financing on the value (profitability) of privatized firms listed on the Nigerian Stock Exchange and to determine their optimal capital structure. Therefore, to achieve these objectives, the paper has been divided into five sections. Section one introduces the subject matter. Section two reviews the theoretical and empirical literature. Section three explains the methodology adopted in the study. Section four presents results and discusses the findings. Section five makes concluding remarks and policy recommendations based on the findings of the study.

It is pertinent to note that a study of this kind is very important and timely because literature on post-privatization performance of firms in Africa and Nigeria in particular is very scanty. In Nigeria, Jerome (2002, 2008); Udeaja 2006; Sanda and Dantama (2008);

and Musa and Usman (2012) have studied post-privatization performance of firms but none of these studies specifically addressed the impact of capital structure on post-privatization firm value and as such determined their capital structure.

2. Theoretical Framework and Literature Review

The theoretical framework for the case of privatization is rested on the neo-liberal theory that emphasizes the incentives and constraints that the market provides to promote efficiency within the firm, that is, "technical efficiency". The theory sees the public sector as constituting a big barrier to economic development in recent times. It therefore advocates increased reliance on market economy through effective privatization of existing public enterprises, deregulation of domestic industries and markets as well as liberalization of trade. However, neo-liberal theory seems not to find a solution to most economies, especially in the developing countries hence its applicability has been questioned (Craig 2002; Nellis 2005 and Jerome 2008). As Nellis (2005) argued, the separation of ownership from management which is a common feature of public limited companies has undermined the efficacy of the privatization process in Africa. A typical firm is owned by numerous owners who have no management functions and managers who have little or no equity interest in the firm. It becomes so difficult for any shareholder (owner) to take a unilateral action to bear the costs of monitoring the managers who may pursue interests different from those of shareholders (Ross, 1973; Jensen and Meckling (1979) and Fama (1980).

Modigliani and Miller (1958) presented their Irrelevant Theorem in a search to ameliorate the effect of asymmetric information, agency cost and corporate income tax. This theorem argues that as a result of the existence of corporate income tax, agency costs, asymmetric information and tax shield on debt in a competitive capital market, firm value is dependent on capital structure. In other word, leverage tends to increase firm value since debt is risk-free. By implication, the higher the debt equity ratio, the lower the corporate tax liability and the higher the after-tax cash flow, the greater the enterprise's performance. Furthermore, Garba (2005) argued that since debt is risk-free, bondholders do not bear the risk. The managers must pay back the amount borrowed. In this context, debt financing triggers managers to have greater stake in the firm and induces them to take selfless measures to increase firm value for the fear of losing their job or the emergency of corporate takeover as a result of insolvency. On the other hand, if the internal monitoring system is weak, equity financing tends to create a fertile ground for managers to pursue interests that might be detrimental to the interests of shareholders since there is no fear of corporate takeover as a result of insolvency. Fairchild (2003) added that issuing debt is a sign of high ability of firm managers who are capable of repaying it. This is in line with cash flow hypothesis which demonstrates that issuing debt invariably sends a positive signal to the investors that the firm is confident enough about its future value. More so, large creditors or debt holders can assume the role of active monitors. They have large investments in the firms to whom they lend funds and, in common with equity owners, debt holders too require adequate returns on their investments. As Shleifer and Vishny (1997) stated, their influence is on account of three reasons: Firstly, when a firm defaults or violates debt covenants, the debt holders receive a variety of control rights. Secondly, owing to the fact that certain debt holders typically lend short term, firms have to approach these lenders at short intervals for more funds. Thirdly, the need to make cash payments provides the firm management with more incentives to operate efficiently to generate even more cash flow (Denis, 2001). This ultimately leads to a reduction in the agency costs of free cash flow. However, Miller (1977) contended that the tax shield advantage of corporate debt is offset by the personal tax rate on investor's debt income which is even higher than that on investor's equity income. Therefore, increasing the level of leverage vis-à-vis equity may not increase firm value. If debt is too high, it ceases to be risk-free and there will be trade-off between its tax benefits and costs (Fairchild, 2003). In this case, optimal capital structure is therefore required for a firm to maximize its value.

Several empirical studies have revealed that leverage which is the proportion of capital of the firm owned through debt would increase firm value. This is likely possible when the enterprises are owned and controlled by private individuals. After reviewing the works of Kaplan and Minton (1994) and Kang and Shivdasani (1995), Shleifer and Vishny (1997) contended that a firm with a high level of debt as a proportion of equity induces managers to maximize firm value. Fairchild (2003) found that increase in leverage level of the post-privatization performance of British Telecom's tends to trigger reduction in the share prices of the company. In contrast, McConnell et al. (2001) using two-stage least square estimator found that at ten percent level of significance, debt financing is positively related to post-privatization firm performance. This result is slightly different from the finding of Garba (2005) who suggested a significant positive relationship between bank value and leverage, but after controlling for the squared term of leverage, the results suggested a significant negative non-linear relationship between bank value and leverage.

Another factor emphasized in the literature on the post-performance of firms is the development of capital market. Boulakri et al. (2001) argued that trade and capital market liberalization might help attract external funds into the process of privatization. Similarly, Clarke et al. (2004) suggested that a market in which there was a high degree of competition would perhaps reap the gains of privatization optimally. More so, Demirgue-Kunt and Huizinga (2000:10) found that stock market development had a positive relationship with post-privatization bank performance. However, adding a square term of stock market development into the model, Demirgue-Kunt and Huizinga (2000:11) found a significant non-linear negative relationship between post-privatization bank performance and stock market development.

Furthermore, Demirgue-Kunt and Huizinga (2000:10) using bank level data for a large number of developed and developing economies over the period 1990-1997 via Ordinary Least Square (OLS) regression model, found a positive relationship between bank profitability and inflation. This finding suggests that privatized banks tend to do well in an inflationary environment. However, Garba (2005) testing for the Modigliani and Miller Irrelevant Theorem on banking sector in Nigeria suggested a statistically significant negative relationship between bank value and inflation in almost all the equations in his models.

The rate of company income tax is also found to influence firm value. According to Damirgue-Kunt and Levine (1995) a significant positive relationship exists between profitability and tax rate on bank income. This suggests that banks in a high-tax environment are able to pass on part of their taxes to their customers. Conversely, Garba (2005) reported that after controlling for company income tax in his model, the results suggested no significant relationship between bank value and rate of tax.

3. Research Methodology

This study uses panel data obtained from the Nigerian Stock Exchange Fact Book (various issues) 2009 and the Annual Reports and Statement of Accounts of firms that underwent share-issue privatization between 1989 and 2001. The data is then transformed into logarithmic returns to produce valid and non-spurious econometric results since the logarithmic returns of initial variables represent the rate of change of the variables used. To select a firm in the sample, it must be listed on the Nigerian Stock Exchange with complete data for the period 2002 – 2009. A non-probability sampling technique in the form of availability sampling is employed (i.e. privatized firms with the required information are selected). Thus, a total number of thirty privatized firms are used for this study. The hypothesis tested in this study is stated that capital structure has no significant relationship with post-privatization value of firms in Nigeria.

The Ordinary Least Square (OLS) multiple regression is adopted in estimating the parameters of the model in this study. This model is expressed as follows:

- $FIRMVALUE = \alpha_0 + \alpha_1 DBTFINACE + \alpha_2 INFLA + \alpha_3 COYINTAX + \alpha_4 STKMRKDVT \; \alpha_5 MGTRESTDMY + \mu$

Where:

- FIRMVALUE = The value of firms is measured in three alternative ways: Return on Sales (ROS), measured as net profit divided by total sales; Return on Assets (ROA), measured as net profit divided by total assets and Return on Equity (ROE) which is measured by net profit divided by the total equity value.
- DBTFINANCE = Debt financing is measured as the ratio of total debt to total assets of the firm.
- INLFA = Inflation is measured as the rate of inflation in the economy.
- COYINTAX = Company income tax is measured as the rate of tax on firm income.
- STKMKTDVT = The Stock market development is measured as ratio of market capitalization to GDP.
- MGTRESTDMY = Management restructuring is measured via dummy by taking the value of one, if the firm has undergone any form of changes in top management after privatization, and zero otherwise.

μ = Error term (assumed to have zero mean and independent cross time period).

$\alpha_0, \alpha_1, \alpha_4, \alpha_5, \geq 0; \; \alpha_2, \alpha_3 \leq 0$

In the empirical literature, Tobin's Q (the market value of equity plus the market value of debt divided by the replacement cost of all assets) has been used extensively as a proxy for measuring a firm's value. It is however difficult to get the required information relating to the market value of debt issued by Nigerian firms, since these are not usually disclosed in the financial reports of the quoted firms. Although, Adenikinju and Ayorinde (2001); Sanda *et al* (2004) and Garba (2005) used modified form of Tobin's Q which could result to spurious results. In order to avoid this problem, this study employs other measures of firm value.

To determine the optimal capital structure, two offsetting facts identified in Flannery and Rangan (2006) and Shyan and Clen-Hsun (2009) are considered. According to these studies, the tax shield increases the value of the firm while financial distress costs lower the value of the firm. The Miller model with limited deductibility of interest leads to an ∩-shaped graph similar to the one presented in Figure 1.
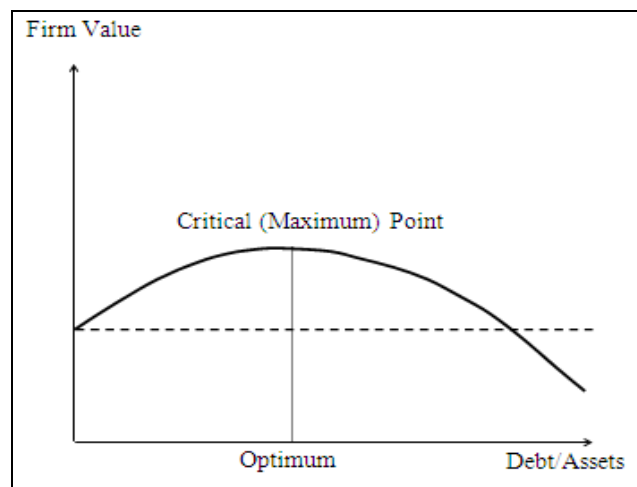

Figure 1: The Optimum ratio of debt to capital (assets) of the firm

The ∩-shape in Figure 1 arises from the trade-off between corporate taxes and bankruptcy costs. Therefore, to determine the optimal capital structure of a firm, the debt-assets ratios will adjust such that the tax advantage and other benefits of debt financing offset the

expected financial distress costs. In line with Garba (2005), we estimate the optimal capital structure of the privatized firms in Nigeria by controlling in all the equations, a squared term of the debt financing and hence take the second derivative of the measures of firm value.

4. Results and Discussion

Independent Variables	ROS	ROA	ROE
Parameter estimates and (t-ratios)			
Dbtfinance	0.025(4.23)***	0.042(3.58)***	0.217(2.98)***
Infla	-0.936(-1.85)*	-0.468(-3.05)***	-0.712(-3.14)***
Coyintax	0.215(0.13)	0.088(1.75)*	0.479(0.24)
Stkmktdevt	0.057 (0.26)	0.236(0.65)	0.143(0.76)
Mgtrestdmy	-0.856(-0.93)	-0.376(-3.77)***	-0.346(-0.49)
Dbtfinance Squared	-0.357 (3.02)***	-0.365(-3.20)***	-0.487(-4.50)***
Critical Point$^\alpha$	0.343	0.324	0.383
Intercept	2.034(3.28)***	2.376(4.62)***	4.287(6.93)***
F-Statistic	4.278	7.632	5.264
R^2	0.375	0.331	0.273
Source: Regression Outputs *Significant at 10 %(*), 5% (**) and 1 %(***)* *$^\alpha$ The critical point is the percentage debt ratio at which the value of each of the measures of firm value reaches its maximum in the estimated regressions.*			

Table 1: OLS Regression Results

The three alternative measures of firm value (profitability) are regressed on a set of explanatory variables. The result of the OLS indicates that debt financing (leverage) has a significant positive relationship with all the alternative measures of post-privatization firm value, implying that firms that go for debt financing after privatization tend to maximize profitability thereby increasing their values. This result concurs with the findings of Garba (2005) and Sanda et al (2004) that leverage tends to increase firm performance on the basis that managers would be triggered to work hard so as to avoid insolvency that may result to corporate takeover.

The findings of this study also reveal that a statistically significant negative relationship exists between post-privatization firm value and inflation in all the equations. This implies that the value of privatized firms tends to decrease in a period of inflation. This inverse relationship may be attributable to the premise that investors will prefer to hold their cash balances rather than investing at a time of inflation. Thus, the finding agrees that of with Garba (2005) but is contrary to the empirical result of Demirgue-Kunt and Huizinga (2000) that suggested that firms tend to increase their value in an inflationary environment.

After controlling for company income tax in the models, the result suggests a positive relationship between post-privatization firm value and company income tax. This relationship is only significant in the equation of return on assets, thus showing clearly that firms after privatization tend to transfer part of the tax burden to customers. This finding is not in agreement with the study conducted by Garba (2005) that firm value is negatively related with bank income tax but however concurs with the results obtained by Damirgue-Kunt and Levine (1995) that suggest a positive relationship between income tax and performance of firms.

Our empirical results further reveal that the development of stock market is positively related to post-privatization firm value in all the equations but statistically insignificant, indicating inefficient and ineffective performance of the capital market in Nigeria. Surprisingly, the coefficient estimate of management restructuring has a negative relationship with all the measures of firm values. This implies that management restructuring captured in the model through a dummy variable tends to have no impact on the post-privatization value (profitability) of firms.

As earlier stated in the methodology, in order to obtain an estimate for optimal capital structure for the privatized firms in Nigeria, we take a squared term of debt financing. The result indicates at one percent, a statistically significant negative non-linear relationship with post-privatization firm value in all the equations. This implies that, corporate financing through debt tends to increase post-privatization profitability of firms thereby improving their value up to a certain level; then any addition to the proportion of debt

financing in the privatized firms will reduce their value. Taking the second derivative of the three measures of firm value, it is evident that the optimal capital structure of the firms that have been privatized in Nigeria is about 34.3%, 32.4% and 38.3% for Return on Sales, Return on Assets and Return on Equity.

The R squared (R^2) values of all the equations are relatively low due to multicollinearity that exists among the variables captured in the models. However, interestingly, the F-Statistic, which is a measure of the overall significance of the estimated regression equations are significant, easily passing through one percent significant level in all the equations. This suggests that collectively the coefficients of the variables employed in the model are statistically significant at the one percent level.

5. Conclusion

The main objectives of this study were to quantitatively examine the impact of capital structure vis-à-vis debt financing on the value of quoted firms after privatization and to determine their optimum capital structure in Nigeria. The data used in this study were analyzed by the econometric technique of Ordinary Least Squares. The results suggested a significant positive linear relationship between firm value and capital structure measured by debt financing. There was also an evidence of a positive linear relationship between firm value and company income tax as well as stock market developments. The results further showed that inflation and management restructuring (captured by a dummy) had a negative linear relationship with firm value. After controlling for a squared term of leverage, the results suggested that corporate financing through debt tended to increase post-privatization firm value up to a given level, beyond which an addition to the proportion of debt financing in the firms reduced their value. Finally, taking the second derivative of firm value, it is evident that the optimal capital structure of the firms that have been privatized in Nigeria is about 34.3%, 32.4% and 38.3% for Return on Sales, Return on Assets and Return on Equity. Based on the findings of this study, the following policy recommendations are made:

- It is necessary for all privatized firms quoted in the Nigerian Stock Exchange to maintain an optimum capital structure so as to enhance high rate of post-privatization performance of firms.
- Since high rate of inflation is inimical to firm value, the authorities should strive to achieve the single digit inflation target which is the target of the monetary policy in Nigeria.
- Since firms after privatization can easily pass the burden of tax onto their customers, the tax authorities may consider a moderate companies income tax regime.
- Given the positive impact of the capital market on the post-privatization firm value, it is necessary to support the development of the capital market through appropriate fiscal and monetary policies.
- Restructuring the management of the firm after privatization should be carried out objectively so that positions are assigned to competent members of staff.

S/No	Name of the Company	Year privatization
1.	West African Providence Insurance Co. Plc	1990
2.	Nigeria Yeast and Alcohol Manufacturing Ind. Plc	1990
3.	Nigeria Sugar Company Ltd.	1990
4.	Law Union & Rock Insurance Co. Plc	1990
5.	NEM insurance Co. Plc	1990
6.	Okomu Oil Pam Co. Plc	1990
7.	National Salt of Nigeria Co. Plc	1991
8.	First Bank of Nig Plc	1992
9.	Union Bank of Nigeria Plc	1993
10.	United Bank for African Plc	1993
11.	International Merchant Bank Plc	2001
12.	NAL Merchant Bank Plc	2001
13.	CONOIL Plc	2001
14.	Unipetrol Nig Plc	2001
15.	West African Portland cement Coy Plc	2001
16.	Benue Cement Coy Plc	2001
17.	Ashaka Cement Coy Plc	2001
18.	Cement Company of Northern Nig Plc	2001
19.	African Petroleum Plc	2001
20.	FSB International Bank Plc	2001
21.	West African Portland cement Co. Plc	2001
22.	British American Insurance Co. Plc	1989
23.	Crusader Insurance Co. Plc	1989
24.	Guinea Insurance Co. Plc	1989
25.	Niger Insurance Co. Plc	1989
27.	Four Mills of Nigeria Plc	1989
28.	Prestige Assurance Co. Plc	1989
29.	Sun Insurance Co. Plc	1989
30.	Royal Exchange Assurance Co. Plc	1989

Appendix 1: List of Nigerian quoted firms used as sample in the study

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