Moderating Effects of Cost of Capital on Debt Financing and Firm Value in Nigeria

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Abstract: **The study examines the moderating effect of cost of capital on debt financing and firm value. Where as, micro panel analysis techniques were utilized for the companies under study spanning 2006-2016. Secondary data were obtained through the companies' individual annual reports and data base of Nigerian Stock Exchange. The studies utilize a sample of 12 listed industrial goods companies in Nigeria. While, hierarchical moderated multiple regression analysis was used for the estimate. The findings of the study revealed a significant positive association among debt financing and value of listed industrial goods companies in Nigeria. While, cost of capital as a good moderator, it was emphasized that, debt financing and cost of capital are drivers of increasing value of the firm among listed industrial goods companies. It was recommended among others that, the finance managers should source capital from various avenues in such way it reduce risk and cost. Likewise, the listed Industrial goods firms should employ more use of debt financing.**

Keywords: **Cost of capital, debt financing, value of firms, Nigeria**

I. INTRODUCTION

Value of firm has always been one of the utmost noteworthy matters of concern in corporate finance literature. It promotes the firm's ability to accomplish the stakeholders wish. And yet, some researchers claim that, it is difficult to value a firm and this may be one of the many unresolved problems in finance (Ajanthan, 2013). However, the choice of mix of investment funds that constitute the capital structure of an organization can endanger the survival of the enterprises if is not properly envisaged. Nonetheless, managing cost of capital has been one of the most important issues in financing decisions and the greatest significant judgments by financial managers because it deals with sources of fund for their operation and growth. Decision on capital structure is essential as it relates to the cost of capital and firm value (Kurfi, 2003).The greatest concern of a firm is stakeholder's value, hence firms must choose an optimal capital structure that will drives a maximum value (Morris, 2001). However, firms create value when they provide a benefit higher than its cost of investment in which the best combination of capital structure will lessen the firm's cost of capital in general (Khadka, 2006). Further, the discussion on the significance of capital mix on the firm value will not be complete if we do not reveal the extent of this relationship by examining the moderating effect of the firm's cost of investment. Thus, the research investigates the contingent influence of the cost of capital on debt financing and firm value relationship.

The moderating variable's presence may modify the initial relationship among the independent and dependent variables and if this occurs, this contingent effect is commonly referred to as interaction (Sekaran & Bougie, 2010). Moreover, the decision on what mix of capital to take as the best combination in terms debt or equity or both is determined by factors like financial risk, tax, market situation, firm's size and the cost of borrowing (Huang & Song, 2006). Also, the element that stimulates capital structure and firm value relationship has been one of the most difficult aspects, since it consist an analysis of numerous elements, such as financial risk and cost of capital. Nonetheless, there solution becomes more challenging, in a condition of instability of economic, political technological and social environment. (Shubita & Alsawalhah, 2012). The absent relationship was the moderating effect of a company's cost of capital on the above mentioned relationship.

Firms have assets which are usually backed by capital providers such as bondholders and shareholders and the risk and cost of this funding (capital) is a measure of what these stakeholders expect in return for lending their money. Hence, this study focused on how the costs of stakeholders' funds influence debt financing and overall firm value.

II. LITERATURE REVIEW

Financing of debt and firm value nexus has been discussed in the literature. For instance, study by Harries and Raviv (1991) assert that issues with regard to debt financing have little concern in the immense literature of capital structure. Also, it is a fact that a firm financial strategy cannot be taken lightly because of its ultimate effect on the firm value. Likewise, numerous financial strategies devise their peculiar risk patterns and cost of its capital. However, rapid improvement in the business world has resulted to serious debates and controversies, nevertheless the questions have not been answered. This section reviews past studies with regards to capital mix and value of firm. Campbell (1995) documents that a long-standing difficult in finance is the internal and external cost of capital calculations. This is due high level of discrepancy of financial tools and approaches. Baker and Wurgler (2000) reveals that weak financial makets affects the growth of investment and value addition. Furthermore, Richard and Robins (2005-2006) portrays that either directly or indirectly financial information affect cost of capital. Tevlin and Whelan (2003) argued that tax credits, research

and development have power in influencing the cost of capital. Subsequently, the study accomplish that both debt and equity have different cost structures and thus impact differently on the value of firm. Sagala (2003) found an inconsistent result that is cost of capital increase for some firms while in others it decline. Williams (2006) opines that financing investment at lowest cost upgrade investors confident and reliability of obtaining higher possible return and risk management from the firms managers. He also explain that debt serves as a good element for financing investment.

Narayanasama (2014) argued that increased cost of debt was influence by inappropriate capital mix. This outcome is similar with earlier studies (Modigliani & Miller 1958). In contrast Okiro, Aduda, and Omoro (2015) documents that capital mix upsurge the level of firm value for 56 listed firm in East Africa. Cost of borrowing was measured using the weighted average charge of capital where the rate of equity was determined using the Ohlson J. model. Similarly, Mary, Yaniv, Konchitchki and Wayne (2015), portrays evidence more transparent firms enjoy less cost of obtaining capital. Marques, Nakao, and Costa (2017), emphasized that companies whose rely on the cost of capital, uncertainty with accelerator and uncertainty, while purchase are mainly from difference of cost of capital and profit. From the literature reviewed it clear that linkage among the studied variables exists. However, none of these studies examine the influence of moderation of the cost of borrowing on the link for firm value and debt financing in Nigeria. Hence, the present studies contribute to the existing literature by the examining these influence as it has not been done by earlier studies.

III. MATERIALS AND METHODS

The study embraced the ex post facto research design. This is deemed necessary in examining how an explanatory variable affects a dependent variable. The ex-post facto research design also helps to ascertain possible causeassociation through identifying some existing consequence on explained variable (Sambo, 2005).The population of the study consists of all the 19 industrial goods companies that are listed on the Nigerian stock Exchange as at 31st December, 2016. The criteria of industrial goods companies are based on Nigerian stock Exchange classification and its choice by this study is informed by the need to make generalizations that cover the entire industrial goods companies.

Therefore, census method has been employed for data collection and enhances legitimacy of the collected data by eliminating errors associated with population (Saunders, Lewis & Thornhill, 2009). Census is a total enumeration which remains merely a head count from part of the population. Similarly, Mugenda and Mugenda (2003) noted that a census is preferred where the population is small and manageable. Hence, information from the census units is used to determine the characteristics for the population. Nonetheless, census method has given equal chance for the entire population.

However, a two-point filter is used to censure the population of the study. For a company to qualify as part of the census, the company must satisfy the following: Firstly, it must be listed within the period of the study. Secondly, it must have the required data for the study. The first filter is to ensure that the same group of companies is used all over the period of the study so as to satisfy the requirement of a panel study. The second filter is to avoid redundant sample. As a result of the foregoing criteria, five companies are dropped because they failed to meet filter (i) the companies are Austin Laz & Company PLC, Cu tix PLC, Dangote Cement PLC, Paints and Coatings Manufacturers Nig. PLC and Portland Paints and Products Nigeria PLC. Moreover, two companies failed to meet filter (ii) and the companies are African Paints (Nigeria) PLC and Ipwa PLC. Hence, a total of seven (7) companies are dropped from the initial population of nineteen (19) companies. This left the study with clean filtered twelve (12) listed industrial goods companies.

This study is based on secondary data that obtained from the annual reports and accounts of the industrial goods companies listed on the Nigerian stock spanning from 2006 to 2016. To minimise data error and ensure accuracy, the data collected from individual's firm's annual report and the financial statements of the companies published in the Nigerian stock exchange Fact book for the various years and the data obtained from these sources relate to both explain and explanatory variables. Though, the data collected was analyzed using multiple and hierarchical regression analysis using 132 observations, including 12 cross-sectional units, Time-series length of 11years. The study analyze the moderating effect of cost of capital on the association among debt financing and value of listed industrial goods companies in Nigeria.

Furthermore, hierarchical regression analysis was used to decide the nature and significance of an association between changes in the response variable and change in the predictor variables (causes) recognized in the study. From the above, three variables considered for the study. Thus, the regression equation model can be expressed below.

$$VF_{it} = \propto + \beta_1 LTDA_{it} + \beta_2 LFRMSZE_{it} + \beta_3 LGRWTH_{it} + \varepsilon_{it} \qquad (1)$$

$$VF_{it} = \propto + \beta_1 LTDA_{it} + \beta_2 LFRMSZE_{it} + \beta_3 LGRWTH_{it} + \beta_4 LWACC_{it} + \varepsilon_{it} \qquad (2)$$

$$VF_{it} = \propto + \beta_1 LTDA_{it} + \beta_2 LFRMSZE_{it} + \beta_3 LGRWTH_{it} + \beta_4 LWACC_{it} + \beta_5 LTDA * WACC_{it} + \beta_6 LFRMSZE * WACC_{it} + \beta_7 LGRWTH * WACC_{it} + \varepsilon_{it} \qquad (3)$$

From equation 1, 2 and 3 VF, TDA, FRMSZE, GRWTH and WACC are firm value, debt ratio (total debt to total assets), firm size (logarithm of total assets), growth (logarithm of total assets), and Weighted Average Cost of borrowing (After tax weighted cost of debt + Weighted cost of equity) the moderating variable, while ε_t, i, t are the constant term, cross-sectional observation of the frim and the time.

IV. RESULTS

Table 1.shows the moderating effects of cost of capital WACC on the association among debt financing TDTA and value TOBIN'S Q of listed industrial goods companies in Nigeria. Similar to the above, three models are run to test the associations. The results are illustrated as follows:

Table 1: The estimated model of moderating effects of WACC on TDTA with TOBIN'S Q

	Model (1)	Model (2)	Model (3)
VARIABLES	Tobin's Q	Tobin's Q	Tobin's Q
Lntdta	0.8143***	1.0069***	0.6259***
	(0.0636)	(0.1893)	(0.1196)
Lnfrmsze	-0.7219**	0.5781	-0.0537
	(0.3591)	(2.0296)	(0.0925)
Lngrwth	-0.0315	-0.0267	0.0038**
	(0.0201)	(0.0257)	(0.0020)
Lnwacc		-0.1582**	3.2009***
		(0.0763)	(0.1303)
Lntdawac			-0.1696***
			(0.0601)
szewac			-0.8928***
			(0.3315)
Grwwac	1.6162**	-2.7587	-0.0348***
	(0.8007)	(4.5789)	(0.0119)
Constant			0.1180
			(0.9353)
Autocorrelation: F(1,9) = Prob>F =			4.277 0.0686
Breusch-Pagan Test: Test (χ^2) Prob> χ^2 =			26.43 0.000
Hausman: χ^2 Prob> χ^2			8.90 0.0636
R^2 R^2 Change	0.7330	0.4443 -0.2605	0.6416 0.4929
Observations	90	90	132
Number of comp	12	12	12

Note: Debt financing =LnTDTA; Moderating variable = LnWACC; Interaction terms = TDTA*WAC, SZE*WAC, GRW*WAC Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Similarly, the problem of multicollinearity among the variables used in the estimated model is investigated using the variance inflation factor VIF illustrated in Table 2 below.

Table 2: Multicollinearity Diagnostic Test

Variables	Tolerance Value	VIFs Value
lnfrmsze	1.23	0.8149
Tdta	1.22	0.8189
lnwacc	1.04	0.9579
lngrwth	1.04	0.9605

Mean vif 1.13

As presented by Table 2, F-statistics shows that the overall significance of the models is statistically significant. R^2 change of model 3 is (0.4929), which is larger than the R^2 change of model 2 (0.2605), specifying the existence of (LnWACC) as a moderating variable. Moreover, in order to know the validity of the estimated fixed effect model, post estimation tests of autocorrelation, Hausman specification and heteroscedasticity tests were conducted. As can be seen from Table 1, the result of the autocorrelation test indicates that there was no problem of autocorrelation in the variables. As for the test of heteroscedasticity, the Probability value of the Breusch-Pagan test shows that there was a problem of heteroscedasticity in the original model which was later rectified using robust standard errors.

Additionally, the VIF test for multicollinearity among the variables indicates that none of the variables in the model has a VIF value up to 5 and therefore no much multicollinearity among the variables included in the model. However, the result of Hausman specification test indicates that the fixed effect here is the most appropriate model and therefore interpretation of results in Table 1of moderating effects relationship will concentrate only on the estimated fixed effect model (model 3) presented in Table 1.

Furthermore, the empirical evidence obtained from the table (model 1) suggests that F-statistics, which explains the overall significance of the model are satisfactory though, which indicates that the regression equation and estimates are significant and can be relied upon to make valid and meaningful inferences. Nonetheless, the F-Statistics majorly shows the fitness of the model and the fact that the established relationship is not due to mere chance. Hence, the coefficients indicate association among the set of explanatory variables and (TOBINS Q). The adjusted R^2 value are however high and shows that the regression model which consists of (LnTDTA), (LnFRMSZE) and (LnGRWTH) which indicates that only about 0.7237 (72) percent of the variations in (TOBIN'S Q) is explained by the variation (LnTDTA).

Nonetheless, cost of capital (WACC) has different effects on the association among debt financing (TDTA) and value (TOBIN'S Q) of listed industrial goods companies in Nigeria. It is hypothesized that cost of capital (LnWACC) has no significant moderating effects on value (TOBIN'S Q) of listed

industrial goods companies in Nigeria. From Table 4.1 above, it was observed that, this variable is significant at 1%. This shows that cost of capital (LnWACC) has negative effect on value of listed industrial goods companies in Nigeria. It implies that a unit decrease in the level of cost of capital (LnWACC) will bring about a unit increase in the value of listed industrial goods companies in Nigeria.

Also, the table shows that (LnTDAWACC), (SZEWAC) and (GRWWAC) are found to have significant impacts on (TOBIN'S Q) implying the moderating effects of (LnWACC) on the association among debt financing (TDTA) and value (TOBINS Q) of listed industrial goods companies is significant at 1%. The change in the sign and power of the interaction term shows the evidenced of the moderating effects of cost of capital (WACC) on the link between (TDTA) and (TOBIN'S Q) of listed industrial goods companies in Nigeria.

V. CONCLUSIONS

This study has presented an empirical analysis of the moderating effect of cost of capital WACCon the association among debt financing and value of listed industrial goods companies in Nigeria based on data available on their annual reports for the period 2006 – 2016. The effect of one explanatory variables is measured on firm value by using TOABIN'S Q; one of the market-based measures value of firm TOABIN's Q, cost of capital WACC as moderating variables was used to restrain the association among debt financing and firm value.

The findings revealed a positive link among debt financing and value of listed industrial goods companies in Nigeria. While, cost of capital as a good moderator, it is established that, debt financing and cost of capital are drivers of increasing value of the firm among listed industrial goods companies. It was recommended among others that, finance manager should consider rightful capital mix for viable investments. Indeed, it is essential to consider cost of capital in the decision regarding capital structure. Likewise, finance managers should source capital from various avenues to reduce cost and risk.

REFERENCES

[1]. Abba, M. & Usman, U. (2016). Corporate Attributes and Share Value of Listed Pharmaceutical Firms in Nigeria. *Researchers World-Journal of Arts, Science & Commerce.* Retrieved from: http://dx.doi.org/10.18843/rwjasc/v7il(1)/10

[2]. Ajanthan, A. (2013). The relationship between dividend pay-out and firm profitability: a study of listed hotels and restaurant companies in Sri Lanka. International Journal of Scientific and Research Publications, 3(6), 1.

[3]. Armadeep, D. (2013). Impact of Cost of Capital in Decision Making. *Indian Journal of Applied Research*, 100-102.

[4]. Baker, M., & Wurgler, J. (2000). Market timing and capital structure. *Journal of Finance, 57,* 1-32.doi: 10. 1111/1540-6261.00414.

[5]. Campbell, R. H. (1995). Capital Structure and Payout Policies.Capital Structure and Dividend Payout Ratios Companies Listed at Nairobi Stock Exchange, Kabarak University First International Conference.

[6]. Harris, M., & Raviv, A. (1991). The theory of capital structure, *Journal of Finance*, Vol. 46, No. 1, pp. 297-355.

[7]. Huang, S., & Song, F. (2006). The determinants of capital structure. Evidence from China. *China Economic Review*, 17, 1-23.

[8]. Khadka, H. B. (2006). Leverage and the Cost of Capital: Some Tests Using Nepalese Data. *The Journal of Nepalese Business Studies*, 85-91.

[9]. Khaledi, S. (2014). Corporate Risk Disclosure: A Content Analysis of Swedish Interim Reports. Master's Thesis in Accounting, Auditing and Analysis. Uppsala University.

[10]. Kurfi, A. K. (2003). Principles of Financial Management. *First edition, Kano: Benchmark publishers limited.*

[11]. Mary E. B., Yaniv, Konchitchki, & Wayne R. (2015). Landsman Cost of Capital and Earnings Transparency, *Journal of Accounting & Economics (JAE)*, Forthcoming Research Paper No. 2015. Working Paper No. 48 http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1348245.

[12]. Marques, M. T., Nakao, S. H., & Costa, P. de S. (2017). Book-tax differences and capital Structure. *Revista de Administração Mackenzie,* 18(6), 177-200. doi 10.1590/1678-69712017/ administracao.v18n6p177-200.

[13]. Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review*, 261-297.

[14]. Morris, M. R. (2001). Creating Shareholder Value: Through Capital Structure Optimization. Value Incorporated.

[15]. Mugenda, M. O., & Mugenda, G. A. (2003). Research Methods: Quantitative and Qualitative Approaches. Laba Graphics Services, Nairobi, Kenya. African Center for Technology Studies.

[16]. Narayanasama, N. (2014). The Relationship between Capital Structure and Overall Cost of Capital in Cooperative Sugar and Spinning Mills. India.

[17]. Okiro, K., Aduda, J., & Omoro, N. (2015). The Effect of Corporate Governance and Capital Structure on Performance of Firms Listed at the East African Community Securities Exchange. *European Scientific Journal*, 517-546.

[18]. Sagala, G. (2003). The Relationship between costs of capital and leverage for companies Quoted on the Nairobi stock exchange. Unpublished M SC Thesis, university of Nairobi, Kenya.

[19]. Sambo, A. A. (2005). Research Methods in Education. Ibadan, Oyo State: *Stiling-Horden Publishers (Nig.) Ltd. Gaaf Building,* 110-112 Oyo Road, Orogun, off University of Ibadan, Second Gate.

[20]. Sekaran, U. & Bougie, R. (2010). Research Methods for Business A Skill BuildingApproach. West Sussex: John Wiley & Sons Ltd.

[21]. Shubita, M. F., & Alsawalhah, J.F. (2012). The Relationship between Capital Structure and Profitability. *International Journal of Business and Social Science*, 3(16).

[22]. Saunders, M. L., Lewis, P., & Thornhill, A. (2009). Research Methods for Business Students. London. UK, *Financial Times Prentice Hall Inc.*