



## The Impact of Debt on Capital Structure: Empirical Evidence from Nigeria

Gbalam Peter Eze<sup>1\*</sup> and Akwarandu Uzochukwu<sup>2</sup>

<sup>1</sup>Department of Banking and Finance, Niger Delta University, Wilberforce Island, Bayelsa State Nigeria.

<sup>2</sup>Department of Banking and Finance, University of Africa, Toru-Orua, Bayelsa State, Nigeria.

### Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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### ABSTRACT

This study evaluates the impact of tax shield on capital structure of quoted non-financial firms in Nigeria. Five hypotheses were formulated following the dependent variables of Long Term Debt Ratio and Short Term Debt Ratio. The independent variables employed for this study are: Operating Income, Non-Debt Tax Shield, Debt Tax Shield, Trade Credit Ratio, Firm Size and Firm Leverage. This study is based on ex-post facto research design and made use of panel data set collected from thirty five (35) non-financial companies over a five year period of 2015 and 2019 financial year. We analyzed the data set using panel least square regression analysis. Our finding supports the trade-off theory developed by Modigliani and Miller's [1] who explained that, "the relevance of debt with the existence of taxes is beneficial for the formation of a firm's capital structure and serves to shield earnings from taxes. The result showed that both variables of debt tax shield and firm leverage significantly impact on capital structure of non-financial firms in Nigeria during the period under investigation. The study recommends among others that concerted efforts should be made by financial regulatory bodies to stabilize the tax structure/system in Nigeria. This is based on the fact that reduction of tax frictions not only increases capital buffers for all firms; it also decreases the "Risk Taking" levels of firm managers.

\*Corresponding author: E-mail: beauclint@yahoo.com;

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## 1. INTRODUCTION

In the past several decades, the role of a firm's capital structure has been an important issue in corporate finance. In practice, in order to maximize firm value and shareholder welfare, one important task for managers is to decide the appropriate capital structure. Researchers have examined this issue for over half a century, attempting to find the factors which affect the choice of capital structure. For example, Modigliani and Miller [2] first showed that a company's value does not depend on its capital structure in perfect capital markets. In addition, various financing decisions are vital for firms' financial welfare. A number of theories have attempted to explain the variations in debt ratios across firms, and these suggest that the selection of capital structure depends on attributes that determine the various costs and benefits associated with debt and equity financing.

Modigliani and Miller [2] initially asserted that the firm value is entirely independent of its capital structure under perfect capital markets; therefore debt and equity finance can substitute perfectly for each other. Modigliani and Miller [1] later found that the presence of taxes and information asymmetry lead to the choice of capital structure and significantly affect the value of the firm. Accordingly, the choice of capital structure waxes and wanes the value of companies. A right choice builds an optimal capital structure that maximizes their value.

Following on the seminal work of Modigliani and Miller [2], both Stiglitz [3] and King [4] theoretically showed that tax shields have an impact on corporate capital structures, thus ultimately on financial stability. Hence, reducing the unequal tax treatment of debt and equity could be an excellent addition to current capital regulation Poole [5]. To study the direct impact of tax shields on bank capital structure seems to be a complicated task since tax shields tend to be rather constant over time and changes to tax rates are more often than not part of a broader fiscal reform package. As a consequence, empirical evidence on the relationship between tax shields and capital structure is mixed for non-financial corporations Graham and Leary [6]. Interestingly, among the determinants of capital structure, taxation is probably the most debated. According to the influential trade-off theory of debt, the optimal level of debt in a firm's capital

structure is determined by the balance of the tax shield provided by debt and the present value of financial distress costs [7]. Theories regarding capital structure differ in their relative emphasis and may be due to the differences in perception on the facts. In this way the trade-off theory developed by Modigliani and Miller's [1] explained that, "the relevance of debt with the existence of taxes and bankruptcy costs is beneficial for debt and serves to shield earnings from taxes. Specifically, DeAngelo and Masulis [8] found that "non-debt tax shields are the substitute of tax shields as it relates to debt financing". The results from extant empirical literatures on the impact of debt tax shield and non-debt tax shield on capital structure has been inconsistent. For example, Athula et al. [9] found a positive relationship between tax ratio and performance while Kebewar and Shah [10] documented a positive relationship between tax and profitability. Although, the study of Zeitun and Tian [11] also documented a positive relationship between tax and profitability, but Klapper and Tzioumis [12] showed that "smaller and more profitable companies are more likely to reduce debt levels", which confirmed the study of Wald [13] and Deesomsak et al. [14] who reported a significant negative relationship between leverage and non-debt tax shields. In relation to developing nations such as Nigeria, related empirical findings suggest the same dissimilarities among their results obtained.

It is against these windows of inconsistent arguments on the relationship between debt tax shield and non-debt tax shield on firm capital structure that the study empirically strive to ascertain whether tax shields could actually influence capital structure of quoted companies in Nigeria.

## 2. REVIEW OF RELATED LITERATURE

### 2.1 Conceptual Clarification

#### 2.1.1 Tax shield and capital structure

In trade-off theory predicts that the higher the tax rate, the more advantage a firm has from additional borrowing. A firm borrows to the point where tax shield benefits intercept with costs of debt (bankruptcy costs, financial distress and agency cost), thus the relationship between interest tax shield and debt can be described as u-shaped [15,16]. The effect of taxation on debt is although more significant for large firms, than

small firms. The evidence from previous studies is ambiguous. Rajan and Zingales [17], documents that taxes do not have any explanatory power. The findings of Graham [18] suggest that firms do not exploit tax benefits, as predicted by trade-off theory.

### **2.1.2 Capital structure**

Capital structure is essential on how a firm finances its overall operations and growth by using different sources of funds. Modigliani-Miller (MM) theorem is the broadly accepted capital structure theory and has been employed by many researchers. MM theorem states that capital structure or finances of a firm is not related to its value in perfect market. In reality, capital structure of a firm is difficult to determine since financial managers find it difficult to exactly determine the optimal capital structure which is a minimum weighted-average cost of capital that maximizes the value of firms.

### **2.1.3 Non-debt tax shield and capital structure**

This theory predicts an inverse relationship between non-debt tax shield and debt tax shield, since it captures the substitution effect between interest tax shield and other tax-deductible entities. Firms that have large non-debt tax shield relative to their cash flow, have small debt ratios DeAngelo and Masulis [8]. Titman and Wessels [19] found that non-debt tax shield had an insignificant effect on debt. Frydenberg [20] found a significant negative relation between non-debt tax shield and leverage for Norwegian manufacturing firms.

### **2.1.4 Debt tax shield and capital structure**

DeAngelo and Masulis [8] proposed a trade-off model including the impact of debt tax shield and non-debt tax shields for optimal capital structure. Myers [21] document that firms should be considered on balancing the value of debt tax shields against various bankruptcy costs. Heinkel, and Zechner [22] use various forms of debt equity ratios to test whether non debt tax shields, such as depreciation or investment tax credits, reduce the propensity to use debt tax shields. None of these studies found significant tax effects.

Engel, Erickson, and Maydew [23] find firms derive substantial net tax benefits when they swap tax-deductible trust preferred stock for nondeductible regular preferred stock.

### **2.1.5 Trade payable and capital structure**

Accounts payable is one source of short-term financing recourse Brealey et al. [24] Shim & Siegl [25] argue that long-term debt financing has less liquidity risks than short-term debt financing since long-term financing's payment period is longer. Leach & Melicher, (2012). Trade payables has a major role in financing of firms. Berry & Jarvis (2006) and Leach & Melicher (2012) opine that trade payable is an important source of funding often paid within 30 or 60 days (the most common periods of time). Firms that are denied finance by other financial sources can still gain access to finance through trade payable account [26].

### **2.1.6 Firm size and capital structure**

Firm size has been used as a determinant of firm's capital structure in most of empirical studies on capital structure and is not uncommon among the most significant variables. Panigrani [27]. The tradeoff theory predicts a positive relationship between firm size and leverage, because size is assumed as a proxy for earnings volatility. Fama and French [28] documents that larger firms are more diversified and show less volatility. Kuhnhausen and Stieber [29] argued that firm size is one of the key determinants of leverage. Larger firms are usually more established in their markets, diversified and less likely to fail. (Mokhova and Zinecker [30] and Degryse et al. [31] Larger firms are more aware of better financing methods, since they employ more financial and administrative staff and have a stronger bargaining position toward lenders.

## **3. REVIEW OF EMPIRICAL STUDIES**

The study of Frank and Goyal, [32] reveal that there is positive relationship between corporate tax shield and firm value given that each increase in the debt portion of a firm's capital structure decreases the after-tax cash flow. On the other hand, when excessive amount of debt has been accumulated by the firm, it risks a default resulting in the transfer of control to the creditors and the incurrence of deadweight costs which further reduce firm value. Thus, the lower the tax advantages of debt, the lower the optimal debt-equity ratio. De Mooij et al. [33] analyze the relationship between corporate taxes, bank leverage and the probability of financial crisis for a worldwide panel of banks. They find that a favorable corporate tax treatment of debt is positively correlated with higher bank leverage

and a higher probability of experiencing a financial crisis.

Glenn [34] exploits exogenous variation in the tax treatment of debt and equity created by the introduction of a tax shield for equity in Belgium. According to the findings of Ngugi [35] the demand for debt is influenced by non-debt tax shields. So then it can be expected that non-debt tax shields influence on performance through influencing debt.

DeAngelo and Masulis [8] found that “non-debt tax shields are the substitute of the tax shields on debt financing”. They argue that depreciation deductions and tax-loss carry forwards can be as replacements for the tax benefits of debt financing. Titman and Wessels [19] argues that size reflect diversity of a firm earning, and thus large firms bear low risk of bankruptcy, and should have more debt compared to smaller firms. Affandi et al. [36] reports the significant positive relationship between size and capital structure. This is consistent with the Trade-Off model of capital structure where large firms seem to employ more debt. Titman and Wessels [19] found a negative relation between a firm’s size and its short-term debt, indicating existence of transaction costs for small firms. This indicates that size is also related to the maturity of debt. Larger firms tend to issue more long-term debt, while smaller firm faces higher cost than larger firms do, in order to issue both equity and long-term debt.

Psillaki and Daskalakis [37] investigated the capital structure of Greek, French, Italian and Portuguese small and medium sized enterprises. They argue that larger firms are more diversified and they are expected to go bankrupt less often than smaller ones. They found a positive relationship between firm size and leverage, but significantly only for France, Greece and Portugal enterprises. Koksal et al. [38] investigated the factors that determine the capital structure choices in Turkey. One of the major findings in their analysis is that what matters most for a firm’s capital structure is not firm’s age or industrial membership but rather its size.

#### **4. THEORETICAL FRAMEWORK**

The study will consider some theories to establish our theoretical framework.

##### **4.1 Static Trade-off Theory**

Myers described the static trade-off framework as “*in which the firm is viewed as setting a target*

*debt-to-value ratio and gradually moving towards it...*” Myers [21] and Frank and Goyal [32] point out that target adjustment serves better as a separate hypothesis, since it is not necessary that firms balance tax savings against bankruptcy costs, to make this adjustment. The static trade-off theory states that companies choose the optimal mixture (substitute debt for equity) by balancing the advantages and disadvantages associated with additional debt, holding the firm’s assets and investments plan constant. Myers, [7] highlights that financial distress includes both bankruptcy costs and agency costs when there is uncertainty around a firm’s credit worthiness. Hence, by increasing their debt, firms get larger interest expenses and lower taxable profits, therefore pay a reduced amount in taxes.

##### **4.2 Dynamic Trade-off theory**

An addition of multiple periods into the original trade-off theory gives us dynamic trade-off theory. Here is the notion of target adjustment well defined and it recognizes that target debt ratios may differ from firm to firm, within the industry and across industries. Companies with tangible assets and a large income, enjoy the benefits from tax shield by having high target debt ratios [39]. In the dynamic model with frictions, a firm’s debt ratio will always differ from the optimal debt ratio, due to the reasons discussed above. In their studies Baker and Martin [40] and Strebulaev [41] found out that shock on leverage is more likely caused by adjustment cost rather than capital structure indifference.

##### **4.3 Agency Costs**

Agency costs can arise due to information asymmetry between managers and shareholders Jassim et al. [42]. These agency costs arise when managers do not own 100% of the firm. Agency costs affect the costs of financial distress and are important for the tradeoff theory. Static trade-off and pecking-order theories are based on assumption that managers and shareholder interests are aligned. Jensen and Meckling [43] direct attention to the role of agency costs in corporate finance, caused by the separation of ownership and control in public firms. They point out two types of potential conflicts; conflict between shareholders and managers (principal agent problems / agency costs of equity) and conflict between shareholders and debt-holders (agency costs of debt).

#### 4.4 Pecking Order Theory

Pecking order theory predicts a firm's capital structure being a result of both its financial requirements over time and minimizing the adverse selection costs, rather than aiming for an optimal debt ratio Myers [21] proposed this theory as a different perspective on capital structure. This theory draws attention to adverse selection problem caused by asymmetric information between a firm's management and its new investors. One major drawback of the Pecking order theory is that it cannot explain why firms with surplus of retained earnings issue debt Frank and Goyal [32]. This theory does well in predicting the relationship between profitability and leverage, but it does not provide any help in explaining many other factors that affect a firm's financing decisions. (Fama and French [44] and Frank and Goyal [45] specifically, the agency cost theory encourages having more debt, particularly for getting tax benefits. Hence, higher use of debt produces increases in firm's performance through tax savings on interest payments.

### 5. RESEARCH METHODS

#### 5.1 Research Design

A research design is an overall plan for research undertaking. In this study, descriptive research design and the *ex-post facto* research design were adopted. The adoption of the *ex-post facto* research design hinged on two main reasons: The data for the study were collected from secondary sources. These secondary sources include: Audited Annual Reports of the relevant listed firms, Nigerian Stock Exchange Fact Book website.

#### 5.2 Sample and Sampling Techniques

A sample of 35 non-financial quoted companies was employed for the study. The random sampling technique was used for selecting these firms. The availability of data in complete and consistent format was the basis for selecting these companies that makes up the study sample.

#### 5.3 Method of Data Collection

The method of data collection for this study involves handpicking of the relevant data (figures) corresponding to both the dependent and independent variables of the study. This data set is then imputed into Microsoft Excel data sheet for further compilation.

#### 5.4 Method of Data Analysis

Data analysis methods deals with various statistical analysis involved in the description of collected data and consequently, making decisions and possible inferences about the phenomena represented by the data. However, fixed and random effects models are two main approaches to empirical research that are based on panel data set because both models can control for unobserved time-invariant heterogeneity peculiar to economic agents. The key assumption for these models is that fixed effects models assume that the heterogeneity is correlated with the explanatory variables while random effects models suppose that the individual specific effects are uncorrelated with the explanatory variables Gujarati [46].

The result of a Hausman test is conducted to determine which model would be appropriate in this context. Hence, the study would employ the Hausman specification test in order to test between the fixed effects and random effects. The major issue is whether there is significant correlation between the unobserved bank-specific random effects and the explanatory variables (Rohaya et al, 2008; Feeny, Gilman & Haris, 2006; Gupta & Newberry, 1997). Therefore, the study tests the null hypothesis that there is no correlation between the unobserved bank-specific random effects and the explanatory variables.

$$H_0: \text{Cov}(X_{it}, \alpha_i) = 0$$

$$H_a: \text{Cov}(X_{it}, \alpha_i) \neq 0$$

The test statistic is Wald  $X^2$ , with k-1 degree of freedom (where k is the number of explanatory variables). If  $X^2$  is statistically significant, we reject the null hypothesis and accept the alternative. It means that there is a correlation between the unobserved bank-specific effects  $\alpha_i$  and the explanatory variables. Thus, the fixed effects model (FEM) would then be the model of choice.

### 6. DATA PRESENTATION AND INTERPRETATION OF RESULTS

The study investigates the impact of tax shield on capital structure by drawing samples from 35 quoted non-financial companies on the Nigerian stock exchange market. While capital structure (proxy by long debt to asset and short debt to asset) are the dependent variables, the explanatory variables adopted for this research study were: tax shield\_debt\_tax\_shield,

trade\_payable\_to\_asset, firm size and leverage. Our data set span through the periods of 2015 – 2019. In identifying the possible impact of capital tax shield on capital structure in Nigeria, we conducted descriptive statistics, correlation, normality test, and Panel fixed and random effect Regression analysis. However, some post estimation test of multicollinearity employing the Variance Inflation Factor Test (VIF) and the test for heteroskedasticity were equally conducted. The results are analyzed show the mean (average), maximum, minimum, standard deviation, sum, variance standard error of the mean and median for each of the variables in terms of companies and in terms of firm year. The result provides some insight into the nature of the selected Nigerian quoted companies that were used in this research study.

**6.1 Data Presentation**

The descriptive statistics table is used to describe the basic features of the data in the study. It provides simple summaries about the sample and the measures. Together with simple analysis, they form the basis of virtually every quantitative analysis of data.

The average tax shield, debt tax shield, trade payable to asset, firm size and leverage were 7.13, 3.17, 41.59, 16.62, 21.86, 17.36, and 58.21 respectively. This result shows Table 1 that leverage has the highest mean value among the variables employed in the study. Another variable

of interest is that of firm size. The descriptive statistics show that the average firm size is 17.39. That is reasonably high.

**6.2 Pearson Correlation Statistics**

Multicollinearity implies the existence of a linear association between two or more explanatory variables. Multicollinearity makes it difficult to differentiate the individual effects of the explanatory variables hence, the regression estimators may be biased in that they tend to have large variances Murray, (2006). Furthermore, if there is a perfect linear association among the explanatory variables, the estimates for a regression model cannot be uniquely computed. The possible existence of multicollinearity is tested based on the correlation matrix incorporating all the variables of interest. Pearson correlation matrices in the Table 2 show that the correlation coefficients among the variables are less than 0.8, which is the limit or cut off correlation percentage commonly suggested by prior studies after which the consequences of multicollinearity is likely to be present Gujarati [46].

The correlation matrix result suggests that there is no multicollinearity among the independent variables of interest. The possible existence of multicollinearity is further tested by computing for variance inflation factor (VIF) seen in the Table 3. According to Gujarati [46], there is no consequence of multicollinearity if the mean VIF is less than 10.

**Table 1. Presents descriptive statistics**

Stats	Tax_sh~d	Debt t~d	Shor~t	Long d~t	Trade~t	Firm s~e	Leverage
Mean	7.132457	3.1169486	41.59103	16.6188	21.86377	17.35857	58.21006
P50	6.27	2.51	39.98	13.68	20.78	17.73	59.74
Max	21.99	19.63	101.18	79.08	52.31	21.23	106.22
Min	.63	0	4.82	0	.89	13.89	18.53
sd	4.255292	3.016878	16.67677	13.01904	11.69643	1.870067	18.24143
variance	18.10751	9.101555	278.1147	169.4954	136.8064	3.497151	332.7499
Se (mean)	.3216698	.2280546	1.260645	.9841468	.8841669	.1413638	1.378923
sum	1248.18	554.66	7278.43	2908.29	3826.16	3037.75	10186.76

**Table 2. Presents pearson correlation matrix**

	Tax_sh~d	Debt_t~d	Short~t	Long_d~t	Trade_t	Firms s~e	leverage
Tax_shield	1.0000						
Debt_tax s~d	0.7623	1.0000					
Short_deb~t	0.4456	0.5077	1.0000				
Long deb~t	0.0902	0.0630	-0.2645	1.0000			
Trade paya~t	0.3001	0.1282	0.5271	-0.1668	1.0000		
Firm size	0.0734	0.0733	0.0119	0.4101	0.1222	1.0000	
Leverage	0.4717	0.50991	0.7255	0.4719	0.3628	0.3035	1.0000

**Table 3. Presents variance inflation factor test result**

Variable	VIF	1/VIF
Debt tax s~d	2.74	0.364992
Tax_shield	2.66	0.376300
Leverage	1.68	0.594470
Trade_payat	1.26	0.794357
Firm size	1.11	0.898442
Mean VIF	1.89	

**Table 4. Presents data normality test**

Variable	Obs	Pr (skewness)	Pr (kurtosis)	Adj chi2(2)	prob>chi2
Tax_shield	175	0.0000	0.0212	24.51	0.0000
Debt_tax s~d	175	0.0000	0.0000	52.70	0.0000
Short debt~t	175	0.1357	0.9998	2.26	0.0000
Long debt~t	175	0.0000	0.0000	43.47	0.0000
Trade_payat	175	0.0141	0.2777	6.79	0.0000
Firm_size	175	0.7050	0.0000	29.70	0.0000
Leverage	175	0.8930	0.0064	6.98	0.0000

The Table 3 presents the mean variance inflation factor (VIF) result of the explanatory variables. The table shows that the mean VIF is 1.89. Therefore, the results from Variance Inflation Factor test indicate that there is no unacceptable level of multicollinearity among the independent variables of interest further confirming that there is no presence of multicollinearity.

**6.3 Data Normality Test**

In statistics, normality tests are used to determine if a data set is well-modeled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normally distributed. Here, the rule of thumb states that if the probability value of the variable/s of interest is significant at 1% or 5% then the variable is not normally distributed. However, the result of skewness and kurtosis test for normality seen in the Table 4 shows that all the variables of interest are not normally distributed since they all significant at 1%.

The value of Breusch-Pagan / Cook-Weisberg test for heteroskedasticity showed that there is the presence of heteroskedasticity in the dataset. However, we resort to the use of fixed and random effect regression analysis which is a good tool for correcting this abnormality in the data set. (Green 2003)

**7. RESULTS**

In testing for the cause-effect relationship between the dependent and independent variables, the two widely used panel data

regression estimation techniques (fixed effect and random effect) were adopted. The Table 6 presents the two panel data estimation techniques results. The results revealed differences in the magnitude of the coefficients, signs and a number of insignificant variables. The estimation of the fixed effect panel regression was based on the assumption of no correlation between the error term and explanatory variables, while that of the random effect, considers that the error term and explanatory variables are correlated. In selecting from the two panel regression estimation results, the Hausman test was conducted. The test is based on the null hypotheses that the random effect model is preferred to fixed effect model.

However, a look at the p-values of the Hausman test result implies that we should accept the null hypothesis. This implies that we should adopt the random effect panel regression results in drawing our conclusion and recommendations. This also implies that the random effect results tend to be more appealing statistically, when compared to the fixed effect. The table 6 shows both the fixed effect and random effect results, though our analysis will focus on the random effect result.

In both the Short Term Capital Structure and the Long Term random effect Capital Structure Models, all the explanatory variables were statistically significant except Tax Shield. The Short Term Capital Structure Model showed that tax\_shield and firm\_size have negative effects on capital structure but the variable of tax shield is not statistically significant. This implies that as

**Table 5. Presents Breusch-Pagan / Cook-Weisberg test**

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables	Fitted values of long debt to asset
Chi2(1)	59.89
prob> chi2	0.0000

**Table 6. Presents fixed effect and random effect results**

	(1) STD (FE)	(2) STD (RE)	(3) LTD (FE)	(4) LTD (RE)
Tax_shield	-0.117	-0.114	0.150	-0.114
Debt_tax s~d	(0.342) 0.176	(0.192) 0.189*	(0.342) -0.225	(0.192) 0.189*
Trade_paya~t	0.186** (0.00)	0.248*** (0.000)	-0.238** (0.006)	0.248*** (0.000)
Firm size	-0.318 (0.252)	-0.242** (0.002)	0.407 (0.253)	-0.242*** (0.002)
Leverage	0.762*** (0.000)	0.703 (0.000)	0.425*** (0.000)	0.703*** (0.000)
N	175	175	175	175
R-sq	0.626		0.173	
Adj. R-sq	0.518		-0.066	

Standardized beta coefficients; p-values in parentheses; \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

the size of the firm increase, it has a damping effect on capital structure of the firms. On the other hand, debt tax shield, trade payable, and leverage were found to have positive effects on capital structure. This is the same in the Long Term Capital Structure Model.

**8. DISCUSSION OF FINDINGS**

The study found that tax shield has no significant effect on capital structure. Firm size has a negative effect on capital structure; while debt tax shield, trade payable, and leverage were found to exert a positive effect on both forms of capital structure. Interestingly, debt tax shield negatively affects long term debt and positively affects short-term debt. The negative coefficient (effect) on long-term debt is consistent with the hypothesis of DeAngelo & Masulis [8]. The positive relationship between capital structure and debt tax shield, trade payable and leverage but consistent with the trade-off theory. The transaction cost theory suggests that transaction cost is derived from the limit rationality of the manager, the uncertainty of the transaction and opportunism. One of the objectives of the enterprise is to minimize the transaction costs.

At present, Nigeria's financial market exhibit elements of imperfection and there are many financing constraints. Hence, debt contract is likely to increase the transaction costs of the enterprise because of high interest of bank loan. However, the non-debt tax shield does not require companies to pay the high cost, so it could reduce the amount of funds occupied. Therefore, companies have a strong incentive to

choose the non-debt tax shield way to delay or reduce the taxes. Aggregately, non-debt tax shield may be preferred over debt tax shield Beneish (1999); Kasznik (1999). Trade payable is one of the major sources of secured short-term financing (Gitman, 2009). From our result we can see that on the average, adopted policies on trade payable transactions have been very profitable for the companies under consideration. As a consequence, it indicates a strong alliance between company and its suppliers which will strategically improve production lines and strengthen credit record for future expansion. However, the need to beware that purchasing initiates cash outflows since overzealous purchasing function can create liquidity problem. This should not be taken carelessly.

Following the discussion above we can deduce that our study supports the pecking order theory; hence we can carefully say that on the average most firms quoted on the stock exchange in Nigeria prefer equity financing to debt financing. Our results are consistent with several studies on international markets [47,48,14,49,50,51,17,52, 53,54,55,56,57].

**9. SUMMARY, CONCLUSION AND RECOMMENDATIONS**

**9.1 Summary of Findings**

The question of a firm's optimal capital structure and the determinants of capital structure have been debated for many years in the corporate finance literature. The capital structure of a firm is a particular combination of short debt, long debt and equity. Firms can choose among many alternative capital structures. The objective of the



study was to establish the impact of tax shield on capital structure by drawing samples from 35 quoted non-financial companies on the Nigerian stock exchange market.

While capital structure (proxy by long debt to asset and short debt to asset) are the dependent variables, the explanatory variables that we adopted for this research study includes: tax\_shield, debt\_tax\_shield, trade\_payable\_to\_asset, firm\_size and leverage. Our data set span through the periods of 2015 – 2019. The secondary data in this analysis covered a period of 5 years and the panel fixed and random effect regression analysis was carried out on the data.

In order to decide whether to present the results of fixed or random effects, we apply Hausman specification test. The results obtained from the hausman specification test reveal that we should adopt the random effect model for policy recommendation.

The findings established that in both the models (long term capital structure and short term capital structure) tax\_shield and firm\_size negative impacts on capital structure which implies that as tax shield and the size of the firm increase, it has a damping effect on the capital structure of the sampled firms. On the other hand, debt\_tax\_shield, trade\_payable\_to\_asset, and leverage were found to be positively impact on capital structure. These results are consistent with several related empirical studies.

## 9.2 Conclusion

Thus this study examines the impact of tax shield on capital structure in Nigeria. The study covered 35 non-financial firms in Nigeria. The regression results indicate that tax\_shield and firm\_size have negative impact on capital structure; while debt\_tax\_shield, trade\_payable\_to\_asset, and leverage were found to positively exert on capital structure. The results of this study also suggest that the capital structure decisions of companies listed on the Nigerian stock market can be explained with reference to the trade off and pecking order theories, and that these companies prefer to utilize internal funds over debt and external equity.

## 9.3 Recommendations

We therefore make the following recommendations

- Corporate boards and organization management may consider internal financing over external financing of the firms.
- Investors should carefully verify the firm's debt level when they are making investment decisions on debt.
- Since a reduction of tax frictions could be an important part of a regulatory incentive scheme that leads to better capitalized financial institutions, efforts should be made by financial regulatory bodies to stabilize the tax structure in Nigeria. This is because the reduction of tax frictions not only increases capital buffers for all firms; it also decreases risk taking behavior.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Modigliani F, Miller MH. Corporate income taxes and the cost of capital: A correction. *American Economic Review*.1963;53:433-443.
2. Modigliani F, Miller MH. The cost of capital, corporation finance, and the theory of investment. *American Economic Review*. 1958;48:261-297.
3. Stiglitz J. Taxation and leverage in international banking. *Journal of Public Economics*. 1973;2(1):1–34.
4. King M. Taxation and the cost of capital. *The Review of Economic Studies*. 1974; 41(1):21–35.
5. Poole W. Moral hazard: The long-lasting legacy of bailouts. *Financial Analysts Journal*. 2009;65(6):17–23.
6. Graham J, Leary M. A review of empirical capital structure research and directions for the future. *Annual Review of Financial Economics*. 2011;3(1):309–345.
7. Myers SC. Capital structure. *Journal of Financial Economics*. 2001;15(2):81-102.
8. DeAngelo H, Masulis R. Optimal capital structure under corporate and personal taxation. *Journal of Financial Economics*. 1980;8(1):3-29.
9. Athula M, Anura D, Khorshed C, Anil C. Capital structure and firm performance in emerging economies: An empirical analysis of Sri Lankan firms. *Corporate Ownership & Control*. 2011;8(4).

10. Kebewar M. The impact of debt on profitability: An empirical study on French panel data HALSHS-00749685, Version; 2012.
11. Zeitun, Tian. Capital structure and corporate performance: Evidence from Jordan. *Australasian Accounting Business and Finance Journal*. 2007;1(4):40-6.
12. Klapper L, Tzioumis K. Taxation and capital structure: Evidence from a transition economy. Policy Research Working Paper 4753, World Bank, October 2008.
13. Wald JK. How firm characteristics affect capital structure: An International Comparison, *Journal of Financial Research*. 1999;22:161-187.
14. Deesomsak, Paudyal, Pescetto. The determinants of capital structure: Evidence from the Asia Pacific region. *Journal of Multinational Financial Management*. 2004; 14(4-5):387-405.
15. Miller MH. Debt and taxes. *Journal of Finance*. 1977;32(2):261-275.
16. Qureshi MA, Imdadullah M, Tanveer A. What determines leverage in Pakistan? A panel data analysis. *African Journal of Business Management*. 2012;6(3):978-985.
17. Rajan RL, Zingales L. What do we know about the capital structure? Some evidence from international data. *Journal of Finance*. 1995;50:1421-1460.
18. Graham, JR. How big are the tax benefits of debt? *Journal of Finance*. 2000;55: 1901-1940.
19. Titman S, Wessels R. The determinants of capital structure choice, *Journal of Finance*. 1988;43(1):1-19.
20. Frydenberg S. Determinants of corporate capital structure of Norwegian manufacturing firms, Trondheim Business School Working Paper, No. 6; 2004.
21. Myers SC. The capital structure puzzle. *The Journal of Finance*. 1984;39(3):574-592
22. Fischer OE, Heinkel R, Zechner J. Dynamic capital structure choice: Theory and Tests, *Journal of Finance*. 1989;44(1): 19-40.
23. Engel E, Merle E, Maydew E. Debt equity hybrid securities. *Journal of Accounting Research*. 1999;37:249-273.
24. Brealey A. Richard, Myers C. Stewart, Marcus J. Alan. *Fundamentals of Corporate Finance*, McRAW-HILL, INC; 2004.
25. Shim Jae K, Siegel Joel G. *Financial Management*, Barron's Educational Series, Inc; 2000.
26. Seifert D, Seifert RW, Protopappa-Sieke M. A review of trade credit literature: Opportunities for research in operations. *European Journal of Operational Research*. 2013;231:245-256.
27. Panigranhi AK. Firm size and capital structure: evidence from Indian corporate; 2011. Available:[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2342488](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2342488) (Accessed 20 January 2015)
28. Fama EF, French KR. Testing trade-off and pecking order predictions about dividend and debt, *Review of financial studies*. 2002;15(1):1-33.
29. Kuhnhausen F, Stieber HW. Determinants of capital structure in non-financial companies; 2014. Available:<http://pubman.mpg.de/pubman/faces/viewItemOverviewPage.jsp?itemIid=escidoc:2071758> (Accessed 18 January 2015)
30. Mokhova N, Zinecker M. The determinants of capital structure: The evidence from the European union, *Acta Universitatis Agrecilturae et Silviculturalae Mendelianae Brunensis*. 2013;59(7):2533-2546
31. Degryse H, Goeij P, Kappert P. The impact of firm and industry characteristics on small firms capital structure, *Small Bus Econ*. 2010;38,431-447
32. Frank MZ, Goyal VK. Tradeoff and pecking order theories of debt. In: Eckbo B.E. (Ed.) *Handbook of corporate finance: Empirical corporate finance*, North Holland: Amsterdam. 2008;2(Chapter 12).
33. De Mooij RA, Keen M, Orihara M. Taxation, bank leverage, and financial crises. *International Monetary Fund*. 2013; 13.
34. Glenn S. Taxes and bank capital structure, National Bank of Belgium and Department of Financial Economics, Ghent University; 2014.
35. Ngugi R. Capital financing behaviour: evidence from firms listed on the Nairobi Stock Exchange. *European Journal of Finance*. 2008;14(7):609-624.
36. Affandi S, Mahmood SMW, Shukur NA. Capital structure of property companies in Malaysia Based on three capital structure theories, *South East Asian Journal of Contemporary Business, Economics and Law*. 2012;1:131-136.

37. Daskalakis N, Psillaki M. Do country of firm explain capital structure? Evidence from SMEs in France and Greece, Applied financial Economics.2008; 18:87-97.
38. Koksal B, Orman C, Oduncu A. Determinants of capital structure: Evidence from a major emerging market economy; 2013. Available:<http://mpra.ub.uni-muenchen.de/48415/> (Accessed 23 January 2015)
39. Brealey RA, Myers SC, Allen F. Principles of Corporate Finance, Global Edition, 10/e, McGraw-Hill, Europe, Middle East and Africa; 2013.
40. Baker HK, Martin GS. Capital structure and financing decisions: theory, evidence, and practice. Kolb Series in Finance. John Wiley & Sons, Inc; 2011.
41. Strebulaev IA. Do tests of capital structure theory mean what they say? Journal of Finance. 2007;62:1747–1787.
42. Jassim A, Dexter Carolyn R, Sidhu, Aman. Agency Theory. Managerial Finance. 1988;14(4):1-5.
43. Jensen M, Meckling W. (Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics. 1976;3(4):305-360.
44. Fama EF, French KR. (Capital structure choices, Critical Finance Review. 2012;1:59-101
45. Frank MZ, Goyal VK. Capital structure decisions: Which factors are reliably important? Financial Management. 2009; 38(1):1-38.
46. Gujarati D. Basic Econometrics 4<sup>th</sup> ed McGraw–Hill Companies; 2004.
47. Booth L, Aivazian V, Demircuc-Kunt A, Maksimovic V. Capital structures in developing countries. The Journal of Finance. 2001;56(1):87-130.
48. Bauer P. Determinants of capital structure: Empirical evidence from the Czech Republic. Czech Journal of Economics and Finance (Finance a uver). 2004;54(1-2):2-21.
49. Eriotis N, Vasiliou D, Ventoura-Neokosmida Z. How firm characteristics affect capital structure: an empirical study. Managerial Finance. 2007;33(5):321-331.
50. Jong A, Kabir R, Nguyen TT. Capital structure around the world: The roles of firm and country-specific determinants. Journal of Banking & Finance. 2008; 32(9):1954-1969.
51. Marsh P. The choice between equity and debt: An empirical study. The Journal of Finance. 1982;37(1):121-144.
52. Silva Serrasqueiro ZM, RêgoRogão MC. Capital structure of listed Portuguese companies: Determinants of debt adjustment. Review of Accounting and Finance. 2009;8(1):54-75.
53. Zou H, Xiao JZ. The financing behaviour of listed Chinese firms. The British Accounting Review. 2006;38(3): 239-258.
54. Bayrakdaroglu A, Ege I, Yazici N. A panel data analysis of capital structure determinants: Empirical results from Turkish capital market. International Journal of Economics and Finance. 2013; 5(4):131.
55. Durukan MB. (Hisse Senetleri İMKB’de İşlem Gören Firmaların Sermaye Yapısı Üzerine Bir Araştırma: 1990-1995. İMKB Dergisi. 1997;1(3):75-91.
56. Gonenc H. Capital structure decisions under micro institutional settings: The case of Turkey. Journal of Emerging Market Finance. 2003;2(1):57-82.
57. Sayilgan G, Karabacak H, Küçükkoçaoğlu G. The firm-specific determinants of corporate capital structure: Evidence from Turkish panel data. Investment Management and Financial Innovations (open-access). 2006;3(3):125-139.

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