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Financial Leverage and Firm Financial Performance in Nigeria: A Panel Data Analysis Approach

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Abstract

This study examined the relationship between financial leverage and firm financial performance in Nigeria using 80 non-financial firms quoted on the Nigerian Stock Exchange from 2000 to 2015. The total debt to capital ratio, debt to equity ratio, cost of debt, debt to asset ratio and long term debt to capital ratios were proxies for financial leverage. Panel data technique in the form of the pooled regression model, fixed effect model, random effect model, and the marginal model had been applied to test hypotheses. The findings of the study revealed earnings per share is significant and negatively related to the debt to equity ratio and the total debt to total asset measures of financial leverage while the return on equity shows an insignificant relationship with the financial leverage measures in Nigeria while the direction of the relationship differs from one variable to the other. It was positive with the total debt to capital ratio and the cost of debt while the total debt to asset ratio, long term debt to capital ratios and the debt to equity ratio was negative. We, therefore recommend that the management of quoted firms in Nigeria should be careful in their employment of leverage so that the cost of debt does not outweigh its benefits as proposed by the tradeoff theory.

Index terms— financial leverage, firm performance, earnings per share, return on equity.

1 Introduction

he financial decision of a firm is of paramount importance because of its resultant effect on the survival and performance of the firm. Capital is a basic resource in a company's financial decision making process amongst others in corporate finance; it is either sourced internally through retained earnings, depreciation, tax shields and other non-cash transactions or externally through debt and/or equity.

The use of the debt finance by a firm is known as financial leverage which spans out from the debate of the optimal capital structure and has been up for discussion for several decades. The use of debt in the capital structure mix is that its efficient use reduced the weighted average cost of capital which aids the increase in the net returns of the firm (Kenn-Ndubuisi & Onyema, 2018). The more debt financing a firm uses in its capital structure, the more financial leverage it employs. Therefore, we can say that leverage is one of the tools required by a company to enhance performance.

Studies have been carried out on the relationship between financial leverage and financial performance in Nigeria such as **??**giriki Some of these studies, focused on a particular sector of the economy or used a small sample size like Abdul & Badmus (2017) that studied the chemical and paints firms using only three quoted firms; Dare & Sola (2010) examined the Nigerian petroleum industry; John-Akamelu, Iyidiobi & Ezejiofor (2017) also investigated only the food production firms using six quoted firms. Also, Adenugba, Ige & Kesinro (2016) investigated five firms for six years; Akande (2013) studied ten firms for 20 years while Thaddeus and Chigbu (2012) sampled only six banks.

With small sample sizes, there might be a limit to generalization to only the sampled sector(s) which was measured by the authors. Empirical studies have also shown varying results thereby, creating a void in this

research; A positive significant effect was supported by Ogiriki, Andabai & Bina (2018) using the ROE, ROA on long term debt in Nigeria; Abdul & Badmus (2017) discovered a negative relationship between ROA and debt ratios that is insignificant while John-Akamelu, Iyidiobi & Ezejiofor (2017) concluded that financial leverage has no significant effect on the EPS.

Therefore, this study tends to fill this gap in knowledge by improving on the previous research done by investigating the effect of the financial leverage on financial performance of quoted non-financial firms in Nigeria using eighty (80) non-financial companies from 10 sectors registered under the Nigerian stock exchange from 2000 -2015.

The hypothesis to be tested will be impact of financial performance measures (Return on equity (ROE) and earnings per share (EPS) on the financial leverage measures in Nigeria (Debt to equity ratio, cost of debt, total debt to total asset, long term debt to capital ratio and total debt to capital ratio).

2 II.

3 Related Literature Review

Ogiriki, Andabai, & Bina (2018) examined financial leverage and its effect on corporate performance of firms in Nigeria from 1999-2016 using long-term-debt, return on asset and return on equity as dependent and explanatory variable respectively by employing the Ordinary Least Square (OLS). The result revealed that ROA and ROE had positive effect on longterm debt of firms that was significant respectively. The study concluded that financial leverage has a significant influence on the corporate performance of firms in Nigeria and recommended the effective management of the long-term debts.

John-Akamelu, Iyidiobi & Ezejiofor (2017) studied the effect of financial leverage on the financial performance of food production firms in Nigeria from 2009 to 2014 using the earnings per share, Return on Equity, Return on Assets as a proxy for performance. The paired sample t-test analysis showed that financial leverage has no significant effect on the EPS of food production firms in Nigeria while there are effects on return on equity and return on assets of companies in Nigeria. They recommended that the amount of debt finance in the financial mix of the firm should be at the optimal level to ensure the firms' assets are utilization appropriately.

Abdul & Badmus (2017) assessed the relationship between leverage (equity) and debt ratio on return on assets of chemicals and paints firms quoted in the Nigerian stock exchange using the ordinary least square (OLS) on a sample of three firms from 2000 -2009. They concluded that the equity finance had a significant and positive impact on ROA while the DR reported a negative and insignificant relationship on the performance measures. Therefore, firms in the sector should employ more equity finance and avoid more debt.

Akani & Kenn-Ndubuisi (2017) examined the effect of capital structure and board structure on firm performance in Nigeria using the Vector auto regression (VAR) test on forty listed companies in the Nigerian Stock Exchange (NSE) from 2008 to 2016. The result established that there exists a significant negative relationship between capital structures (DER) and the firm performance using ROA and ROE.

Abubakar (2016) investigated the effects of financial leverage on firms' performance using 66 nonfinancial firms of the Nigerian Stock Exchange from 2005-2014. Panel data techniques in the form of Pooled Ordinary Least Squares (POLS), Fixed Effects and Random Effects estimators revealed that an increase in the equity portion of total debt-equity ratio (TDER) has a significant positive effect on firms' financial performance measured by return on equity (ROE). The study concludes among others that financial leverage surrogated by total-debt equity ratio (TDER) is an important indicator of firms' financial performance and vice versa. He recommended that non-financial firms' quoted on the NSE should increase the equity portion of the debt-equity mix in their capital structure to improve firms' financial performance.

Adenugba, Ige & Kesinro (2016) studied the relationship between financial leverage and firms' value using a sample of five firms listed on Nigerian Stock Exchange (NSE) for 6 years from 2007-2012. The Ordinary Least Square (OLS) statistical technique showed a significant relationship and effect between financial leverage and firms' value. The study concludes that financial leverage is a better source of finance than equity to firms when there is a need to finance long-term projects.

Rehman (2013) studied the relationship between financial leverage and financial performance of quoted sugar companies in Pakistan. The results revealed a positive relationship between the debt-equity ratio on the ROA and sales growth while it was negative with the earning per share, net profit margin and return on equity. This negative relationship between debtequity ratio and earnings per share (EPS) support the fact that as debt increases, the interest payment will also rise, so that EPS will decrease. Akande (2013) studied the relationship between financial leverage and performance using financial statements of 10 Nigerian firms over 20 years from 1991-2010. The Ordinary Least Square (OLS) regression analysis was conducted on panel data collected using ROA, ROE, EPS, and DPS on the one hand and DC (total debts to capital employed) as proxies for firm's performance and debt financing respectively. Results showed that a positive relationships exist between DC and ROE, EPS and DPS, while a negative relationship exists between DC and ROA. The study concluded that financial leverage would considerably impact on firm performance.

Akinmulegun (2012) empirically examines the effect of financial leverage on selected indicators of corporate performance in Nigeria using earnings per share (EPS), net assets per share (NAPS) as a proxy for performance using the Vector Auto-Regression (VAR) technique for analysis. Findings indicated that leverage significantly

affects corporate performance in Nigeria. Therefore, theories that are adequate for indigenous macroeconomic variables can be developed rather than the structured theories adopted by the advanced developed countries of the world, as these theories cannot be appropriate proxies for advancing the course of the developing nations.

Chinaemerem and Anthony (2012), carried out a study on the impact of capital structure on the financial performance of Nigerian firms using 30 nonfinancial quoted companies on the Nigerian Stock Exchange (NSE) for a period of 7 years from 2004-2010. Panel data was analyzed using the ordinary least squares (OLS) method of estimation. The result showed that a firm's financial leverage (debt ratio) has a significantly negative relationship with the firm's financial performance (ROA and ROE).

Onaolapo (2010) examined the impact of capital structure on firm's financial performance using sample of thirty non-financial firms listed on the Nigerian Stock Exchange during the seven-year period, 2001-2007 by adopting the Ordinary Least Squares (OLS) as a method of estimation. The result reveals that a firm's capital structure has a significantly negative impact on the firm's financial measures agreeing with prior empirical studies and also provide evidence that supports the Agency cost theory.

Dare & Sola (2010) studied the impact of capital structure on corporate performance in the Nigerian Petroleum Industry using the panel data analysis consisting of the Fixed-effect estimation, Random-effect estimation, and Maximum likelihood estimation. There exist a positive relationship between earnings per share and dividend per share on leverage ratio recommending that the management of the industry should do more to improve on their leverage ratio.

4 III.

5 Methodology

Data on debt ratios and performance sourced from the annual report, financial statements of companies and the fact books of the Nigerian stock exchange in Nigeria for the period under review.

6 a) Operational variables

7 Financial leverage

Leverage ratio is any of several financial measurements that look at how much capital comes in the form of debt. The financial leverage measures commonly used are a.

8 Equity

Earnings per share (EPS) = Net income -dividend on preference share Average outstanding common share(7)

9 b) Model specification and method of data analysis

The model is specified thus: adopt a longitudinal data regression model. The families of longitudinal data regression model to be considered here are, Pooled regression model, fixed effect model, random effect model, and marginal model. While the first three are subject specific, the last is the population average model. The choice of the model among the subject-specific models will be made using the Hausman test while model adequacy will be ascertained using F-ratio and diagnosis of the model residuals.

10 Pooled Regression Model:

The model involves pooling all the variables over time and is given by:it it k it it it X X X Y ? ? ? ? ? + + + + + = ... 2 1 0 (8) i = 1, 2,...,k, t = 1, 2,?,T

Where, it Y = Response Variables (here EPS and ROE for i th company on t th year) it X = explanatory Variables (here DER, COD, TDTA, LTDC, TDCR i th company and t th year). Fixed Effect Model: Here the explanatory variables are fixed, and the intercept varies from one company to another. It is given by:it it k it it i it X X X Y ? ? ? ? ? + + + + + = ... 2 1 0 (9)

Where the intercept would be represented thus:ki k i i i D D D ? ? ? ? ? + + + + = ... 3 3 2 2 1 0 (10) i = 1, 2,...,k, t = 1, 2,?,T

Where, it Y = Response Variables (here EPS and ROE for i th company on t th year) it X = explanatory Variables (here DER, COD, TDTA, LTDC, TDCR i th company and t th year). Random Effect Model: This is also known as an error correction model. Here the dummy variables in Equation 3.8 a are expressed through error term or disturbance.it it k it it i it X X X Y ? ? ? ? ? + + + + + = ... 2 1 0**(11)**

Where,i i u + = 1 0 ? ? (12)

Therefore Equation 3.9 becomes:it i it k it it it u X X X Y ? ? ? ? ? + + + + + + = ... 2 1 1 it it k it it it w X X X Y + + + + + = ? ? ? ? .... 2 1 1 (13) i = 1, 2,...,k, t = 1, 2,?,T, it i it u w ? + =

Where, it Y = Response Variables (here EPS and ROE for i th company on t th year) it X = explanatory Variables (here DER, COD, TDTA, LTDC, TDCR i th company and t th year). Marginal Model: This has the same structure with the pooled regression model but uses a different estimation procedure as well has a different interpretation. While the pooled regression model uses maximum likelihood estimation procedure, the marginal model uses generalized estimating equations with different "working correlation matrix."

IV. V.

11 Result and Discussion

12 Findings

From the tables above, two competing models that will be used to make an inference to this work are the pooled regression and the marginal regression models which have similar results. The F-values of each of the model was found to be significant with the value of ($P<0.05$), indicating overall adequacy of the regression models.

The empirical evidence of the earnings per share (EPS) on the financial leverage measures suggests that the debt to equity ratio and the total debt to total asset has negative and significant impact on EPS while the long term debt to capital ratio, total debt to capital ratio and the cost of debt has a negative impact on EPS which is insignificant. This result agrees with Rehman (2013) that found a negative relationship between financial leverage and firm performance using the EPS and disagrees with John-Akamelu, Iyidiobi, and Ezejiofor (2012) which found no significant effect between EPS and the financial leverage measures.

On the other hand, the long term debt to capital ratio, debt to equity ratio and the total debt to total asset have a negative impact which is insignificant with ROE whereas the total debt to capital ratio and the cost of debt reported a positive impact which is also insignificant. This result disagrees with John-Akamelu, Iyidiobu, and Ezejiofor (2017) which found a significant relationship using the ROE and agrees with Akani and Kenn-Ndubuisi (2017) and Rehman (2013) that found a negative relationship between ROE and DER.

13 VI. Conclusion and Recommendation

This study empirically tested the relationship of financial leverage on firm financial performance in Nigeria throughout 2000 -2015 using the panel data regression models (pooled regression model, fixed effect model, random effect model and marginal model).

In accordance with the research findings that earnings per share has a significant negative relationship with the financial leverage measures, we therefore support the saying that the increase in debt of a firm will also come with an increase in their interest payment on such debt which in turn leads to a decrease in the earnings per share of such firm. On the other hand, the return on equity (ROE) has no significant relationship with the financial leverage measures. The empirical evidence shows that the impact of the financial leverage varies among different performance measurement for Nigerian firms.

Therefore, in line with the findings of this study, we recommend the following:

1. With a negative impact between DER and the performance measures, management of quoted firms in Nigeria should be cautious in their employment of leverage so that the cost of debt does not outweigh its benefits as proposed by the tradeoff theory. 2. The TDTA also has a negative impact on the financial leverage measure, therefore, firms should also apply caution in the use of leverage to finance assets as a continuous rise in debt not adequately managed can move the control of firms from the shareholders to the debt holders. 3. For firms to enhance their financial performance, it is necessary that they find the appropriate mix of debt to equity capital that best suits them which can become their optimal capital structure.

1

Variable	Model Method Pooled Regression Model	Fixed Effect Model	Random Effect Model	Marginal Model
Constant (C)	5.6372*** (0.0000)	-0.6196 (0.5256)	1.2558 (0.1824)	4.6847*** (0.000)
Long term debt to capital ratio (LTDCR)	-0.1221 (0.7215)	0.2184 (0.4898)	0.1400 (0.6532)	0.0498 (0.8700)
Total debt to capital ratio (TDCR)	-0.6790 (0.4436)	-0.2824 (0.7665)	-0.5190 (0.5652)	-0.1864 (0.8460)
Debt to equity ratio (DER)	-2.0483*** (0.0001)	-0.4326 (0.4659)	-0.9998* (0.0706)	-1.5711*** (0.006)
Cost of Debt (COD)	-5.9401 (0.1550)	-2.0121 (0.6155)	-3.1731 (0.4174)	-4.0739 (0.2870)
TDTA	-9.1476*** (0.0022)	10.8825*** (0.0005)	5.1921* (0.0828)	-7.8018** (0.017)
F-value	6.8*	6.68*	1.47*	Wald Statistic=17.32,
Durbin-Watson (D.W)	1.42	2.02	1.84	Correlation matrix= Stationary

Figure 1: Table 1 :

2

Variable	Model Method Pooled Regression Model	Fixed Effect Model	Random Effect Model	Marginal Model
Constant (C)	0.4792 (0.0000)	0.3608 (0.0000)	0.4028 (0.0000)	0.4531 (0.0000)
Long term debt to capital ratio (LTDCR)	-0.0252 (0.2011)	-0.0092 (0.6353)	-0.0136 (0.4749)	-0.0176 (0.350)
Total debt to capital ratio (TDCR)	0.0187 (0.7142)	-0.0100 (08637)	-0.0035 (0.9476)	0.0202 (0.714)
Debt to equity ratio (DER)	-0.2003 (0.0000)	-0.1686 (0.0000)	-0.1818 (0.0000)	-0.1883 (0.0000)
Cost of Debt (COD)	0.1670 (0.4875)	0.2160 (0.3773)	0.1969 (0.4073)	0.1118 (0.632)
TDTA	-0.5617 (0.0011)	-0.1254 (0.5129)	-0.2709 (0.1342)	-0.4666 (0.013)
F-value	12.6*	4.81*	6.69*	Wald Statistic= 43.76, Correlation
Durbin-Watson (D.W)	1.6	2.1	2.0	matrix= Stationary (1)

( ) -P-value, * -significant at 10%
** -significant at 5%
*** -significant at 1%

Hausman Test p-value = 0.175

Source: Research findings from strata 11

Figure 2: Table 2 :

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