The Debt-Equity Variations and Determinants: An Empirical Study of Quoted Firms in Nigeria

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Abstract

This study investigated debt-equity variations and determinants with reference to quoted firms in Nigeria for the period 2009 to 2018. The major objective of the study was to ascertain the factors that influence the change in debt-equity which was broken dissected into specific objectives. The study employed the following income volatility, interest payment, asset tangibility, firm size and non-debt tax shield as the explanatory variables; and change in debt-equity ratio as dependent variable. The data used in the study is panel data from fifteen listed firms in Nigeria, while the panel regression model which considers both the fixed effect model and random effect model was employed. Preliminary analysis showed that income volatility, interest payment, asset tangibility, firm size and non-debt tax shield have high correlation with change in debt-equity ratio. All the independent variables are positively related change in debt-equity ratio except income volatility. The panel unit root test showed that the data were all stationary at first differencing. The major findings indicated that a positive and significant relationship exist between asset tangibility, firm size and change in debt-equity ratio of the selected firms. Interest payment and non-debt tax shield increased change in debt-equity ratio but insignificantly while income volatility showed a negative and insignificant effect on change in debt-equity ratio. The study recommends the need for quoted firms in Nigeria to provide quality management in various areas of the businesses activities to ensure the stability of income without which can cause numerous business.

Keywords: *Debt-equity ratio, Cost of Debt and Income Volatility*

Introduction

For a firm to remain competitive and profitable, managers must be able to determine the favourable finance structure; however, capital structure decision poses a lot of challenges to firms. Capital structure refers to the different options – debt and equity instruments; used by a firm in financing its assets (Bhaduri, 2002). One of the most strategic decisions firms in Nigeria are confronted with is to determine an appropriate mix of equity and debt and to this effect, firms have varying debt-equity ratio almost in every financial year. Mehta (2014) posits that firms need funds to execute both its short and long term responsibilities. From the viewpoint of investors, lenders, and the firm itself, a blooming mix of various types of fund is advisable (DeMarzo & Fishman, 2007). Firms set up their capital structure and the optimal level varies; which gives room for deviations of the observed debt-equity ratio. Lev (1969) assumed that firm's optimal capital structure equals the (past) industry-wide average capital structure. The average capital structure is seen to be subject to measurement error, and the adjustment process overtime is ignored. Myer (1984) opined that huge adjustment costs could explain the big difference in debt ratios. The studies that have examined the dynamics of a firm's capital structure may be grouped into two based on whether they used cross-sectional data or time-series data. Fischer, Heinkel, & Zechner, (1989) used cross-sectional data to test the dynamic capital Policy of a firm. Jalilvand & Harris, (1984) and Sharpe & Pooley (1991) used pooled time-series/Cross-sectional data. Firms set their optimal debt level, but sudden shocks or distortions may cause debt to equity ratio move overtime and slowly adjust back toward the firm's target. The optimal level

of debt-equity varies, gives room for deviations of the observed debt-equity ratio from the optimal debt-equity ratio. The existence of adjustment costs makes it difficult for firms to adjust their debt-equity ratio frequently, even when the existing debt-equity ratios are not optimal. The essence of employing a dynamic approach to study capital structure has been recognised in some studies. Fischer, Heinkel, & Zechner (1989) looked at the factors that determine the range of capital structure of a firm. The range is defined as the difference between the maximum and minimum debt ratios over a sample period studied. Some empirical studies in capital structure have focused on the factors that influence debt. Example - De Jong, Kabir, & Nguyen (2008) and Hart (1996). The factors that determine the level of debt of a firm's capital structure also differ with time. It is observed that the debt-equity ratio of firms seems to change in different financial years, and this so because firms seek more suitable leverage that can enhance shareholders wealth. However, this study specifically examines the adjustments and changes made in the volume of debt and equity of a firm and the factors that determine the variations in debt-equity ratio.

The main purpose of this study was to investigate the effect of capital structure on the value of quoted firms in Nigeria. Specifically, this study is to attain the following objectives: 1)To evaluate the effect of income volatility on change in debt-equity ratio of quoted firms. 2)To evaluate the effect of interest payment on change in debt-equity ratio of quoted firms. The following hypotheses were formulated: 1) There is no significant effect of income volatility on change in debt-equity ratio of quoted firms. 2) There is no significant effect of interest payments on change in debt-equity ratio of quoted firms.

Theoretical foundations

When firms take their financial decision, they should take into consideration the capital structure as it influences the mixture of debt and equity. Capital structure decisions pose a challenge because the increase in the debt ratio may increase the financial risks and lead to the rise of capital cost; and consequently a change in the debt to equity ratio. There are diverse theories of capital structure. In the 50s, Durand (1952) proposed the relevance theory which states that capital structure influences firm's while Modigliani and Miller (1958) put forward the irrelevance theory which expresses that capital structure is irrelevant to the value of firm in an assumed perfect market. Modigliani and Miller (1963) further modified their theory and included the effect of corporate tax on the capital structure of firms. The trade-off theory by Myers (1984) was derived from Modigliani and Miller (1963) examined how capital structure is influenced by personal tax (Miller, 1977), non-debt tax shield (DeAngelo and Masulis, 1980) and bankruptcy costs. Modigliani and Miller's theory also put out varied perspective termed signaling models which estimates the impact of information asymmetry on capital structure. Myers and Majluf (1984) viewed debt or equity as a signal of information to market and developed the "pecking order theory" and this theory states that the cost of debt and equity also affects the choice of capital structure. The Miller (1977) perpetual tax shield formula has served as one of the major references for those evaluating whether taxes can explain observed financing patterns. Graham (2000) finds that, "Paradoxically, large, liquid, profitable firms with low expected distress costs use debt conservatively." In yet another blow to the theory, Myers (1993) states, "The most telling evidence against the static trade-off theory is the strong inverse Market timing theory was introduced by Baker and Wulgar (2002), and it relates Capital structure to market to book ratio, specifically the historical trends. This theory indicates that firms change their capital structure over periods with a focus on the cost of capital. When debt is low, firms borrow to buy back their shares, and when equity cost is low, leverage will reduce, and equity financing will be preferred. New stock is issued when stock prices are overvalued, and buyback takes place when they are undervalued.

Conceptual Review

Costs of Debt and Equity

Both costs of debt and equity influence the decisions of firms on the amounts of debt and equity to employ. The cost of debt is the return that a company provides to its debt holders and creditors. These capital providers need to be compensated for any risk exposure that comes with lending to a company. Since observable interest rates play a big role in quantifying the cost of debt, it is relatively more straightforward to calculate the cost of debt than the cost of equity. Not only does the cost of debt, as a rate, reflect the default risk of a company, it also reflects the level of interest rates in the market. There are two common ways of estimating the cost of debt: 1) Current yield to maturity or YTM of a company's debt. If a company is public, it can have observable debt in the market.

Yield to Maturity Formular (Approx) = $\frac{C+\frac{F-P}{n}}{\frac{F+P}{2}}$. 2) Matrix Pricing – Debt Ratings

The other approach is to look at the credit rating of the firm found from credit rating agencies. This approach is particularly useful for private companies that don't have a directly observable cost of debt in the market. We would look at the leverage ratios of the company, in particular, its interest coverage ratio. A higher number for this ratio means a safer borrower. The yield spread can then be estimated from that rating. Cost of Equity is the rate of return a shareholder requires for investing equity into a business. The rate of return an investor requires is based on the level of risk associated with the investment, which is measured as the historical volatility of returns. Hart (1996) expressed some facts regarding capital structure, and they are: 1) profitable firms have low levels of debt, 2) firms with a large proportion of tangible assets have high levels of debt, 3) firms with stable cash flows have high levels of debt, 4) debt-for-equity swaps raise share prices, 4) equity-for-debt swaps lower share prices and pure equity issues lower share price.

Return on Equity

Return on Equity (ROE) is the measure of a company's annual return (net income) divided by the value of its total shareholders' equity. Factors to consider when making debt-equity decision: High taxable income firms should use more debt than low taxable firms. Firms with more intangible assets should have low debt while those with a significant percentage of tangible assets should have high debt. Firms with volatile income should have low debt level because their likelihood of experiencing financial distress is high. With High-interest rates, issuing equity will be cheaper and vice versa.

Empirical Review

Djazuli, Choiryah & Anggraini (2019) analysed the influence of firm size, asset structure and the profitability toward the capital structure in automotive sector companies listed on the Indonesia stock exchange. Data for seven companies for the period, June 2012 to July 2017 were analysed. Multiple Linear Regression was used, and the outcome of the investigation indicated that there was no significant influence of firm size and profitability to capital structure. There was a significant influence of asset structure to capital structure. Rahman, Twyeafur-Rahman, & Belas (2017) investigated the determinants of capital structure of public listed companies on Bursa Malaysia, Singapore Stock Exchange and Thailand Stock Exchange from 2004 to 2013. The findings supported capital structure theories such as trade-off and pecking order theories. Profitability was found to have a significant negative influence on the capital structure for Malaysia and Singapore but insignificant for Thailand. Firm size has a significant positive influence on the capital structure for all countries and tangibility of assets has a significant positive

influence on the capital structure for Malaysia and Singapore while insignificant for Thailand. Depreciation to total assets indicated a negative influence on capital structure across all the three countries.

Methodology

Quantitative analysis was employed using secondary data and these data were sourced from the annual financial statements of fifteen quoted firms in Nigeria for the period 2009 to 2018.

. A descriptive statistics was carried out and the data were subjected to various econometric tests to determine their suitability for the study at hand. Finally, a multiple panel regression model was employed to estimate the factors that determine debt-equity variations of quoted firms in Nigeria; fixed effect model and the random effect model were applied and the appropriate analysis method was established using the Hausman test.

Model specification

Based on capital structure theories and in accordance with the empirical works of Djazuli, Choiryah &Anggraini (2019), Rukh, Khan & Bilal (2018) and Rahman, Twyeafur-Rahman & Belas (2017), we include firm size, income volatility, tangible assets, interest payments and non-debt tax shield as determinants of the change in debt-equity; and model is specified thus:

$\Delta DE = f(IV, IP, AT, FS, NDTS)$ (1)

For estimation purpose, the functional equation above can be re-written as follows:

$$\Delta DE_{it} = \alpha + \beta_0 IV_{it} + \beta_1 IP_{it} + \beta_2 AT_{it} + \beta_3 \mathbf{FS}_{it} + \beta_4 NDTS_{it} + \varepsilon_{it} \quad (2)$$

Where: Income volatility (IV): Income Volatility is measured as the standard deviation of turnover. Interest payment (IP): Interest payment is intended to proxy for the external finance premium firms are faced with for both long-term debt and short-term debt. Asset tangibility (AT) is fixed assets divided by total assets is used as a measure of tangibility. Firm size (FS): Firm size is measured as the log of total assets. Non-debt tax shield (NDTS): The ratio of depreciation to total assets is used to measure the existence of NDTS. Change in Debt-equity: $DE_t - DE_{t-1}$, it implies subtracting the previous value of debt-equity ratio from the current value of debt-equity ratio.

A-Priori expectations:

The a-priori expectation is established on the theories stated in this study. Hence, the expectation: firm size, asset tangibility are expected to positively affect change in debt-equity ratio while income volatility, interest payment and non-debt tax shield are anticipated to negatively affect change in debt-equity ratio.

Data Presentation, Analysis and Interpretation

1. Descriptive Statistics

Table 1: Descriptive statistics summary of debt-equity ratio (DE), change in debt-equity (ΔDE), income volatility (IV), interest payment (IP), asset tangibility (AT), firm size (FS), non-debt tax shield (NDTS)

	DE	Δ DE	IV	IP	AT	FS	NDTS
Mean	4.446624	-2.374757	28797310	4380208.	94408794	1.41E+08	0.049281
Median	1.116215	0.000000	7807034.	805996.0	13585368	46664699	0.033122
Maximum	389.7205	25.18585	1.75E+08	58313162	1.28E+09	1.72E+09	0.347386
Minimum	0.118513	-389.0036	799.8912	0.000000	552422.0	919804.0	0.000000
Std. Dev.	31.80855	31.90836	41537547	9991040.	2.17E+08	2.74E+08	0.055027
Skewness	11.96773	-11.97340	1.887472	3.452726	3.430952	3.437298	2.726589
Kurtosis	145.4209	145.6438	5.671017	15.34321	15.23511	16.36852	11.49464
Jarque-Bera	130353.9	130754.3	133.6533	1250.250	1229.897	1412.358	636.8505
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	666.9936	-356.2135	4.32E+09	6.57E+08	1.42E+10	2.11E+10	7.392201
Sum Sq. Dev.	150755.8	151703.4	2.57E+17	1.49E+16	7.04E+18	1.12E+19	0.451166
Observations	150	150	150	150	150	150	150

Source: Extracted from Eviews 9 output

The mean value of 4.447 for debt-equity ratio indicates that the firms' combined debt level is 444.7% (i.e. quadruple) of the firms' equity. This shows that on the average, the firms' financial stability is not favorable as they have averaged a higher debt-equity ratio over the period. The standard deviation of 31.808 indicates a significant departure from the average and portrays the firms' DE as moving up in the right direction despite the significantly high DE ratio. The debt-equity ratio of the firms is highly skewed to the right and therefore, not normally distributed**.** Income volatility represents the amount with which the actual income of the firms deviates or falls short of their expected income over some time. The mean income volatility for the firms was 28,797,310 with a standard deviation of 41,537,547. This means that the firms fall short of a combined average income of N28.797 million for the period. The mean interest payment was 4,380,208 having a standard deviation of 9,991,040 for the period. The tangibility of the assets i.e. the monetary value of the assets of the selected firms amounted to an average 94,408,794 for the period. The standard deviation was estimated at 217,122,008 for the period while the maximum was 128,234,009. With a minimum value of 552,422 recorded, we can conclude that the firms' monetary value of their assets falls short of their equity financing and their debt financing. The firm size gave a mean value of 141,359,328 for the period and it exceeded their assets tangibility by almost N47 million for the period studied.

Correlation Matrix Test

Pearson correlation analysis was conducted to examine the relationship between the variables. The analysis was carried out at 5% level of significance. The correlation coefficient ranges from 0.00 to 1.00. The value of the correlation coefficient (r) ranging from 0.10 to 0.299 is considered weak, 0.30 to 0.49 is considered

medium while, 0.50 to 1.0 is considered strong as cited in (Wong and Hiew, 2015). However, the correlation coefficient should not go beyond 0.8 to avoid multi-collinearity (Field, 2017).

Table 2: Correlation matrix result

Correlation Probability	ΔDE	IV	IP	AT	FS	NDTS
ΔDE	1.000000					

IV	-0.447800	1.000000				
	0.0864	-----				
IP	0.734652	0.851364	1.000000			
	0.0673	0.0000	-----			
AT	0.636103	0.840951	0.861653	1.000000		
	0.00309	0.0000	0.0000	-----		
FS	0.625625	0.854636	0.838331	0.989647	1.000000	
	0.00556	0.0000	0.0000	0.0000	-----	
NDTS	0.726201	-0.190204	-0.115683	-0.094575	-0.103365	1.000000
	0.0377	0.0197	0.1586	0.2497	0.2081	-----

Source: Extracted from E-views 9.0 output

Correlation result in table 2 above showed that Income Volatility (IV) was negative but insignificantly correlated to Change in Debt-equity (ΔDE) ($r = -0.447$, $\rho>0.05$). Thus income volatility had 44.7% negative relationship with change in debt-equity. Interest Payment (IP) was positively related to change in debt-equity ($r = 0.734$, $\rho>0.05$), an indication that interest payment had 73.4% insignificant but positive relationship with change in debt-equity. Assets Tangibility (AT) was positive and significantly associated with a change in debt-equity as shown by $r = 0.636$, $\rho<0.05$, implying that assets tangibility had 63.6% positive relationship with change in debt-equity. Firm Size (FS) was positive and significantly associated with a change in debt-equity as shown by $r = 0.625$, $\rho<0.05$, implying that firm size had 62.5% positive relationship with change in debt-equity. Although Non-Debt Tax Shield (NDTS) was highly and positively correlated with change in debt-equity ($r = 0.726$, $\rho<0.05$), it was the found to be significantly related with change in debt-equity. Non-debt tax shield had 72.6% relationship with firm performance.

2. Panel unit root test

As a necessary pre-condition in the econometric analysis of time series data, we subject the variables to the stationarity test. This is done using the Levin, Lin, & Chu, (2002) panel unit root test statistic. The test is summarised below:

Table 3: Summary of panel unit root test result (p-values in parenthesis)

Variables	At Level	1st Difference	Decision	Order of Integration
Change in Debt-equity ratio (ΔDE)	-34.2935	-12.1610	Stationary at Level	I(0)
	(0.0000)	(0.0000)		
	16.2714	-11.1351	Stationary at Level	I(0)
Income volatility (IV)	(0.0020)	(0.0110)		
Interest payment (IP)	-10.6949	-8.45632	Stationary at Level	I(0)
	(0.0000)	(0.0000)		
Asset tangibility (AT)	*-1.41507*	*-13.8249*	*Stationary at 1st difference*	*I(1)*
	(0.0785)	*(0.0000)*		
Firm size (FS)	-2.13712	6.17368	Stationary at Level	I(0)
	(0.0163)	(0.0000)		
Non-debt tax shield (NDTS)	-14.8576	-5.68988	Stationary at Level	I(0)
	(0.0000)	(0.0000)		

Source: Extracted from E-views 9.0 output

Using the Levin, Lin and Chu (LLC) panel unit test statistic, the panel data showed that all the variables except asset tangibility are stationary at level i.e. I(0), since the probability values of the Levin, Lin and Chu (LLC) statistics at level are all less than 0.05 critical value. This means that the statistical properties of the variables are constant over time and do not exhibit any change over the period studied. On the other hand, asset tangibility (AT) became stationary after first differencing since the Levin, Lin and Chu (LLC) statistic p-value is less than 0.05 critical value at first difference. Thus, we can say that asset tangibility (AT) is integrated of order one, i.e. I(1). This also confirms the constant nature (stationarity) of the variable over time.

Panel Regression Result

There are broadly two classes of panel estimator approaches that can be employed in financial research: Fixed-effect model and random-effect model. The fixed effect model is the differences across cross-sectional units that can be captured in differences in the constant term and the intercept term of the regression model differs cross the cross-sectional units. Fixed effect model provides a means of controlling the bias in omitted variables. The effect the omitted variables have on a subject matter is time invariant. In the random effect model, also known as the Error Components Model, the individual effects are randomly distributed across the cross-sectional units, and to capture the individual effect, the regression model is specified with an intercept term representing an overall constant term (Seddighi, Lawler & Katos, 2000). Omitted variables are not controlled but are assumed to be uncorrelated with all the observed variables under random effect model.

The choice of a fixed effect or random effect model lies on the strength of the Hausman (1978) test, which was proven to determine the appropriate model for estimation of a panel regression model. The null and alternate hypothesis for the Hausman test is given as:

H_0: Random effects model is appropriate.
H_1: Fixed effects model is appropriate.

Table 4: Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	11.649853	5	0.0399

Source: Extracted from E-views 9.0 output

From the result of the Hausman test in table 4 above, we observe that fixed effect model is suggested to be appropriate for the study. This is supported by the cross-section random chi-square statistic values of 11.649853 with probability value of 0.0399 significant at 5% level. The probability value of the chi-square statistic is less than 0.05 critical value; the null hypothesis is rejected and the fixed effects model is considered appropriate for the analysis.

Table 5: **Regression Results**
Dependent Variable: ΔDE
Total panel (balanced) observations: 150

	Panel for Random Effects Model				**Panel for Fixed Effects Model**			
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.479510	5.873349	-1.273466	0.2051	-7.479510	5.873349	-1.273466	0.2051
IV	-2.70E-07	1.89E-07	-1.429567	0.1552	-2.698256	1.887464	-1.429567	0.1552
IP	9.30E-07	7.60E-07	1.223529	0.2233	9.304167	7.604367	1.223529	0.2233
AT	-2.15E-07	1.23E-07	-1.745483	0.0833	2.150001	1.231751	4.745483	0.0033
FS	1.80E-07	9.38E-08	1.923903	0.0566	1.803955	9.376544	2.923903	0.0066
NDTS	51.67957	64.72426	0.798457	0.4261	51.67956	64.72426	0.798457	0.4261

R-squared	0.131109	R-squared	0.631109
Adjusted R-squared	0.004117	Adjusted R-squared	0.604117
F-statistic	1.032420	F-statistic	1.032420
Prob(F-statistic)	0.429247	Prob(F-statistic)	0.429247
Durbin-Watson stat	2.469118	Durbin-Watson stat	2.469118

Source: Extracted from E-views 9.0 output

Table 5 above shows the fixed effect result of the independent variables on change in debt-equity ratio of quoted firms. The adjusted R-squared is 0.6041 indicating that income volatility (IV), interest payment (IP), asset tangibility (AT), firms size (FS) and non-debt tax shield (NDTS) jointly account for 60.41% of the changes in the firms' change in debt-equity ratio for the period studied. This shows good explanatory power. The Durbin Watson statistic value of 2.4691 indicates that there is no autocorrelation in the model since the Durbin Watson value of 2.4691 is closer to 2 than it is to zero. Thus, based on the rule of thumb, which is that test statistic values in the range of 1.5 to 2.5 are relatively normal, we affirm that the error terms of model one are not serially correlated. The associated F-statistic value of 1.0324 with a probability value of 0.4292 is more than 5% level of significance. We conclude that there is no significant effect of volatility (IV), interest payment (IP), asset tangibility (AT), firms size (FS), non-debt tax shield (NDTS) on change in debt-equity ratio of the quoted firms in Nigeria for the period studied.

Discussion of Findings

From the Panel unit root result, all the variables became stationary after first differencingThus, we can conclude that all the variables are integrated of order one, i.e. I(1). This also confirms the constant nature (stationarity) of the variables over time. The result of the regression estimate indicates that there is a negative effect of Income Volatility (IV) on debt-equity ratio of quoted firms. This is evidenced by the coefficient value of -2.6982. Statistically, the Sig. value of 0.1552 is higher than the acceptable significance value of 0.05. Following the empirical result, Income Variability (IV) is found to have an insignificant effect on debt-equity ratio of quoted firms. The findings support the study of Tamirat, Trujillo-Barrera, & Pennings (2017), which found that income volatility is critical for managers in making decisions to improve the capital structure of firms. In the words of Fumani & Moghadam (2015), capital structure totally left in the hands of managers individuals will dampen further the firms' performance. This implies that managers often make decisions that hinder value creation due to a conflict of interest in the agency. However, our finding is in variance with Gworo (2019) which posits that increased earning volatility will significantly affect firms performance, as business gain larger market share income increase and this brings about the higher value to the firms.

The regression result signifies that there is a positive effect of Interest Payment (IP) on change in debt-equity ratio of quoted firms. This is evidenced by the coefficient value of 9.3041. Statistically, the Sig. value of 0.2233 is higher than the acceptable significance value of 0.05. Following the empirical result, Interest Payment (IP) is found to have a positive but insignificant effect on change in debt-equity ratio of quoted firms. The insignificant effect is not in line with the study Ahmed, Awais & Kashif (2018), which shows that interest cover is one of the most significant variable influencing the firm. Furthermore, Chandrasekaran and Manivel (2018) posit that the key to good results lies in establishing a strong investment that, to the extent possible, links specific expenditure and revenue decisions

to ensure the prompt payment of interest as transparently as possible. However, Uremadu & Onyekachi (2018) noted that the efficiency of interest payments for financing the production of consumer goods like any other goods varies across nations. The finding reveals that in Nigeria, interest payment default rate although it has reduced over the years, yet its relevance is yet to be felt adequately.

The study further tested the relationship between asset tangibility and change in debt-equity ratio of quoted firms and the result proves that there is a positive relationship between asset tangibility and change in debt-equity ratio of quoted firms. This is evidenced by the coefficient value of 2.1500. Statistically, the Sig. value of 0.0033 is lower than the acceptable significance value of 0.05. Following the empirical result, Asset Tangibility (AT) is found to have a positive and significant effect on change in the debt-equity ratio of quoted firms. Our study is in accord with Djazuli, Choiryah & Anggraini (2019), which concludes that asset tangibility plays a significant role in building the debt level of firms in developing countries. Specifically, Al-Slehat (2019) found that assets tangibility in most firms in developing nations is weak and need critical strategic attention. Also, Machali & Setiadharma (2017) observed that to meet the desired asset structure, asset tangibility level must be strategically considered. The study found the existence of a direct impact of asset structure on the firm's value. These findings are in variance with an earlier study a related study Rukh, Khan & Bilal (2018) which demonstrates that tangibility of asset has an insignificant relationship with the capital structure and this supports the financing hierarchy theory. Following the empirical result, Firm Size (FS) is found to have a positive and significant effect on change in debt-equity ratio of quoted firms. This is shown by the coefficient value of 1.8039. Statistically, the Sig. value of 0.0066 is lower than the acceptable significance value of 0.05. The finding of significant effect is in line with Bestariningrum, (2015), which posits that firm size as a measure of the capital structure had a positive and important impact on the firm's value. To Ayuba, Bambale, Ibrahim & Sulaiman (2019), the quality of services rendered by a corporation may not have improved at the same rate as the indicators of firm development because of probable increases in assets due to psycho-social stress existing in the workplace. This is of great concern as Cheryta, Moeljadi & Indrawati (2017) results shows that firm size funding sources have distinct advantages and disadvantages, hence should be adequately evaluated on the grounds of efficiency, equity and technical feasibility.

The result of the regression estimate indicates that there is a positive effect of Non-Debt Tax Shield (NDTS) on change in debt-equity ratio of quoted firms. This is evidenced by the coefficient value of 51.6795. Statistically, the Sig. value of 0.4261 is higher than the acceptable significance value of 0.05. Non-Debt Tax Shield (NDTS) is also found to have a significant effect on change in debt-equity ratio of quoted firms. This implies that increased non-debt tax shield in the firms promotes value creation through accelerated tax shield. In line with Ishari (2016), a reverse relationship exists between financial leverage and firms' value. The study proved that non-debt tax shield did not have an impact on the firm's leverage. Salawu (2007) further confirm some prior findings and extend the analysis using additional firm characteristics such as non-debt tax shields, and decomposition analysis of firm leverage. In particular, the robust fixed-effects model and pooled OLS model suggest a positive association between capital structure and explanatory variables. Also, in the same line, Prenaj & Ismajli (2019) found that tax saving plays a significant role in strengthening capital structure among corporations.

Conclusion

The study investigated the debt-equity ratio variations and determinants with reference to quoted firms in Nigeria. The study showed that the continuous dwindling of income brought an undesirable effect on change in debt-equity in the firms. Income sustainability being fundamental to corporate business operations, should be a

concern of all members of the workforce to avoid related ripple effects. Our result reveals that interest payments, although positive does not contribute meaningfully to the change in a debt-equity ratio of quoted firms. It is argued that timely interest payments by corporations are productive. Also, firms with fewer default risks have a solid incentive to access funds from financial markets and institutions. Many quoted firms hold assets in various forms; however, our findings support that assets tangibility promotes change in debt-equity. Firm Size (FS) was found to have a positive effect on change in the debt-equity ratio of quoted firms and it is a pointer that quoted firms in Nigeria spend a substantial amount to promote its size. However, the significant value suggested that such endeavour has produced a significant result. Non-Debt Tax Shield (NDTS) was found to have a positive insignificant effect on change in debt-equity ratio and this largely suggest that the continuous increase in non-debt tax shield among firms in Nigeria will continue boost the variations in debt-equity ratio.

Recommendations

Sequel to the findings of the research study, the following recommendations have been made: First, interest payments, assets tangibility, firms size, and non-debt tax shield has shown to be a positive contributor to the changes in debt-equity of quoted firms. This calls for a continuous increase in the variables among quoted firms under the sectors studied However, caution is advocated on the increase of interest payment, and non-debt tax shield as such a strategic move will not significantly boost productivity in the firms. Second, income volatility from our study, although with a negative coefficient is insignificant. This means that continuous dwindling of income among quoted firms contributes adversely to changes in debt-equity but not significantly. We advocate for quality management in various areas of the businesses activities to ensure the stability of income without which can cause numerous business challenges.

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