Capital Structure Determinants and Financial Leverage of Listed Industrial Companies in Nigeria

[1] Adewumi Zaid ADEYEMI; [2]Adetunji Abdul-Azeez ADEREMI & [3]Israel Adebowale AGUNBIADE

[1,2] Department of Accounting, Osun State University, Okuku Campus, Osun State, Nigeria
[3] Department of Banking and Finance, Osun State University, Okuku Campus, Osun State, Nigeria

Corresponding Author: adewumi.adeyemi@uniosun.edu.ng

Abstract

This study explored the nexus between capital structure determinants and financial leverage of quoted industrial firms in Nigeria for period of eleven years, 2010 to 2020. Secondary data used for this research work obtained from financial report and accounts of sampled companies. Capital structure determinants were measured by profitability, assets tangibility, firm size, growth rate, firm age, default risk and earnings per share. These were used as explanatory variables. Financial leverage measured by total debt to shareholders' funds representing dependent variable. Fixed effect regression model was used to establish the impact of explanatory variables on dependent variable. Study's results revealed that assets tangibility, firm's size and firm's age have positive and substantial influence on financial leverage. Profitability, default risk and earnings per share have negative and substantial influence on financial leverage of quoted industrial companies in Nigeria. Furthermore, results also showed that collectively capital structure determinants considered by this study have strong and important impact on financial leverage of sampled quoted industrial firms in Nigeria. It was recommended that management of sampled industrial companies should use the three main determinant variables that have positive and significant impact on financial leverage as a yardstick in determining their optimum capital structure; this would reduce their cost of capital and maximise shareholders' returns.

Keywords: Capital Structure, Trade-Off Theory, Pecking Order Theory, Industrial Companies, Financial Leverage

JEL Classifications: G32, L16

1.   Introduction

Capital structure or financial leverage is one of crucial topic in finance that deals with financial structure of a firm, which is proportion of funds provided by the outsider investors and funds provided by the owners of firm. It is widely recognised as one of weighty financial choices needs to be taken by management of firms. Capital structure is the way in which company combines its finance to debt and equity, that is fixed charges finances (long-term loans and debentures) in one side and shareholders' fund (ordinary shares, reserves and retained earnings) in another side. Management of a firm should determine the best debt-equity mix, optimum capital structure that would minimise cost of capital, improve market value and promote effective and efficient performance of the firm. Optimum capital structure decision would affect firm's performance and should be based on trade-off between return and risk (Awwal, 2017; Greenwood, 2016 and Uremadu & Onyekachi, 2018). Yousef

International Journal of Innovative Research in Accounting and Sustainability
ISSN: 2736-1381 (Print), ISSN 2736-1500 (Online)
Vol. 7, No. 1, 2022

IJIRAS/AAUA
https://ijiras.org

(2019) stressed that optimum capital structure should harmonise the trade-off between tax benefits connected with borrow finance and the corresponding rise in the costs of potential financial difficulty. Therefore, management of firm should choose the best capital structure for the firm, and there should be aware that if unsuitable capital mix is used, firm will be unable to minimise its cost of finance and maximise shareholders' wealth.

There are various variables that determines firm's debt-equity ratio, among them are: liquidity, firm's age, financial policy, growth rate and risk (Bland, 2019; Habibu & Soddiq, 2017; Handoo & Sharma, 2014; Sayigan & Karabacak, 2014). Past empirical studies on capital structure determinants and financial leverage focused on developed countries. These later extended to developing countries, Nigeria inclusive (Adigiwe & Oregue, 2019; Awwal, 2017; Goyal, 2013; Sethi & Tiwari, 2016). However, most of the previous studies on Nigeria focused on textiles, construction, beverages and banking sectors, while many studies used combination of firms in different sectors (Anthony & Odunayo, 2015; Olaniyi, Elelu & Abdulsalam, 2015; Olokoyo, 2013; Oboh & Adekoya 2012). This study differs from prior research works by focusing on capital structure determinants (namely: profitability, assets tangibility, firm's size, growth rate, firm's age, default risk, earnings per share) and financial leverage (total debt to shareholders' funds) in listed Nigeria industrial firms, from 2010 to 2020. Sequence to this preliminary section, the remaining of this research work structured in this manner: section two examines the conceptual, theoretical and relevant literature, while third section outlines the research techniques. Section four provides the study's findings and discussion. Section five concludes the study and recommendations were suggested.

2. Literature Review and Hypotheses Development

2.1 Capital Structure

Capital structure can be defined as a manner in which firm combines its finances to fixed charge finances and shareholders' funds. It is a blend of funds provided by outsiders (total debt) and funds provided by the owners of firm (shareholders' funds) which firm employed to finance its current assets and non-current assets. Firm that uses only equity (without debt) to finance its activities is referred to as un-leveraged or un-geared firm, while firm that use both shareholders' funds and external fund to finance its activities is referred to as leveraged or geared firm. In practice firms prefer use of more equity than debt (this is known as low geared or low debt-equity ratio), and this can be as a result of many factors. Optimum capital structure of company should be decided by the management of firm after consideration of many factors.

The optimum capital structure determinant factors are grouped into two: internal or micro factors and external or macro factors. The external factors are macro economy variables of the country that may affect the firm, such as inflation rate, exchange rate, monetary and fiscal policies of government, capital market conditions. The optimum debt-equity structure of company would be an integration of funds provided by outsider investors and funds provided by the owners of company that could yield smallest cost of capital and improves worth of company (Uremadu & Onyekachi, 2018). Optimum capital structure should create highest returns to the owners of the firm without extra expenses and should attract lowest risk of loss of control (Soumadi and Hayajneh, 2018).

In the literature leverage are classified into two: operating leverage and financial leverage. The former connected to use of fixed expenses in operation of a firm, which would have effect on firm's profit. The latter connected to the use of borrowed capital in relation to use of shareholders' capital. There are several ways of measuring financial leverage, prominent

International Journal of Innovative Research in Accounting and Sustainability
ISSN: 2736-1381 (Print), ISSN 2736-1500 (Online)
Vol. 7, No. 1, 2022

IJIRAS/AAUA
https://ijiras.org

among them are: ratio of total debt to total capital, debt to equity ratio, ratio of net operating income to interest charges. Financial leverage would magnify the firm's shareholders' return and also increase their risk. Therefore, firm's trade-off between return and risk should be used to ascertain the appropriate debt-equity proportion to be used by the firm. The industrial goods companies are category of companies that produce capital products used by other companies in construction and manufacturing sub-sector. Companies under industrial goods sub-sector include companies that produce and sell equipment and machinery to other companies that use them to produce finished goods to consumers. As at 31st December 2020, twenty-seven companies in this sub-sector are quoted on Nigeria stock exchange.

2.1.1 Determinants of Capital Structure

Firm's capital structure is determined by many factors, among them are: assets tangibility, size of the firm, profitability, growth rate, risk, age of the firm, interest rate, economic condition, industrial classification, liquidity and so on. Asset's tangibility plays an important role in determine firm's capital structure. This factor determines amount of funds that can be borrowed by the firm, since lenders will like to provide funds for company that has physical assets than company that has intangible assets. Khanyu and Darmar (2017) concluded that firms that invest heavily in tangible assets will have higher financial leverage. Size of the firm determines firm accessibility to various sources of finance. Big firms easily have access to various sources of funds such as debentures, long term loans, preference shares than small firms. Big firms have higher levels of debt than small firms since big firms will have higher chance of diversification, which lead to lower default risk. According to Goyal (2013) and Awwal (2017) big firms tend to hold more debt than small firms, because they are regarded as being too big to fail and have access to long term funds.

Profitability is another variable that determine firm's capital structure. Firm that generates high profit would maintain relatively low debt-equity ratio, since such firm can retain certain percentage of its profits as retained earnings, which can be used to finance more investment. The retained earnings which refer to as internally generated funds can be used to raise addition capital before other sources of finance. Most of the firms prefer use of retained earnings to rise of additional equity in order to avoid dilution of ownership. Also, firms with high profit show sign of high debt capacity and less risk. Growth rate can be referred to as expansion or development of a firm. Firms with rapid growth rate would experience having more assets, more investment and new product line. Firms with high growth would have incentives to decrease debt in their capital structure. Increase in growth would lead to stable earnings and result to having adequate profit to meet fixed interest of long-term debts. Yousef (2019) postulated that firms that experience high growth rate would have higher debt-equity ratio than firms that experience low growth rate. Manata (2016) concluded that as firms moved from one stage to another stage as a result of growth their debt-equity ratio expected to change, either to more debt to equity or more equity to debt.

Risk is one of the primary determinants of firm's capital structure. It is generally believed that existence of debt capital in capital structure of a firm would increases probability of bankruptcy. Firms with high debt-equity ratio would have high risk, which may favour shareholders if the firm successful and providers of long-term loans lose if the firm fails. As firm's age continue to increases, firm gains more reputation and goodwill. These will increase firm's capacity in accommodating more debt. Most of the time providers of funds usually evaluate creditworthiness of a firm, which may include assessing years of its existence before loans can be granted. Interest rate is cost of borrowing for the firm. The more the ability of a firm to pay interest of debts to providers of long-term debts, the more

the ability of a firm to secure more debts. Capital structure of a firm is also determined by economic condition in the country. According to Nassar (2016) debt-equity ratio of a firm would depend on economic condition in the country, whether the economy is booming or deteriorating. Firms can adjust their capital structure faster when country economy condition is favourable than when the economy is witnessing depression.

Industry classification is also identified as one of the determinants of capital structure of a firm. Past research studies such as Blobork (2018) Songlean and Moyer (2019), Lungard (2018) concluded that industry classification has influence on firm's capital structure. They explained that firms in the same industry usually face similar economic and environmental problems and also lead to having similar capital structure. Liquidity is ability to convert assets into cash. Liquidity ratio will show ability of a firm to settle its short-term financial commitments. Firms that can keep sufficient liquid assets to finance their short-term obligations and using part of it to finance investment may not need to raise external debt. Therefore, it is expected that the higher the firm's liquidity, the lower the firm's debt-equity ratio.

2.1.2   Capital Structure Determinants and Firm's Financial Leverage

Assets Tangibility and Financial Leverage: Most common argument in the literature favour positive relationship between assets tangibility and firm's financial leverage. Agency theory predicted a positive relationship between assets tangibility and financial leverage by explained that the higher the tangible assets of a firm, the more the firm's debt-equity ratio. In addition, many empirical studies provide evidence supporting positive relationship between assets tangibility and firm's financial leverage among them are Aljamen (2018), Gumey (2019), Sethi and Tiwari (2016). Negative relationship between assets tangibility and financial leverage were recorded by Shuaibu (2016).

Size of the Firm and Financial Leverage: In the literature positive relationship between size of the firm and financial leverage halsens by trade-off theory but pecking order theory foretells negative relationship between the two variables. Like theoretical, empirical evidence on the relationship between firm size and financial leverage of firms also quite varying in conclusions. Studies of Disaqu (2016), Habibu & Soddiqi (2017), Motobert (2017) reported positive and significant relationship between the two variables. On the other hand, Twairesh (2014), Yao (2019) identified a negative relationship between firm size and debt-equity ratio.

Profitability and Financial Leverages: Pecking order theory prophesies negative relationship between profitability and financial leverages. Other theories such as signal theory and traditional theory predict otherwise. Empirical evidence from the past studies seems to be consistent with pecking order theory. Alabi and Olujinmi (2015), Oboh and Adekoya (2012) Olokoyo (2013) found profitability negatively related with financial leverage. In contrary, Soumadi and Hayajneh (2018), Goyal (2013) reported a positive relationship between profitability and financial leverages.

Growth Rate and Financial Leverage: Agency cost theory predicted negative relationship between growth rate and debit-equity ratio of firm, while pecking other theory forespelled positive relationship between growth rate and financial leverage. Empirically, studies of Abiodun (2014), Nassar (2016), Phooimng and Rahman (2017), Uremadu and Onyekaeh (2018) reached the same conclusion that growth rate is positively related with financial leverage of firms. Contradict to this, Blobork (2018) found a negative relationship between the two variables.

IJIRAS/AAUA
https://ijiras.org

Risk and Financial Leverage: Empirically many researchers found a negative relationship between risk and financial leverage of a firm, while few studies reported a positive relationship between the two variables. Studies of Anarfo (2015); Chechet, Garba and Odudu (2013), Greenwood (2016) reported negative relationship between the two variables, whereas studies of Sethi and Tiwari (2016), Sheik and Wang (2013) reported positive relationship.

Age of the Firm and Financial Leverage: Relationship between firm's age and financial leverage are reported by many researchers to be negatively related. Studies of Guner (2016), Meida and Pellotic (2019), Yousef (2019) reported this, while studies of Awwal (2017), Shuaibu (2016) reported positive relationship between firm's age and financial leverage.

Interest Rate and Financial Leverage: The lower the interest rate the higher the debt finance firm employed and the higher the interest rate the lower the debt-equity ratio of the firm. Many previous studies such as Gumey (2019), Horvathova and Mokrisova (2017), Sayigan and Karabacak (2014) confirmed this by concluded that there is a negative relationship between interest rate and financial leverage of a firm.

Economic Condition and Financial Leverage: Previous research studies found a positive relationship between economic condition of a nation and financial leverage of company, among these studies are Handoo and Sharma (2014), Songlean and Moyer (2019).

Industrial Classification and Financial Leverage: Findings of many past studies (Disaqu, 2016: Motobert, 2017: Yao, Chiu and Gano, 2019) supported positive relationship between industrial classification of firms and their financial leverage.

Liquidity and Financial Leverage: Pecking order theory predicted that liquidity and firm's financial leverage would be negatively related, since high liquid firms would have sufficient funds to finance their investment with internal funds and may not need to raise funds from outsiders. Empirical studies of Adigwe and Oregue (2019), Aljaman (2018), Bland (2019), Xiaomeng and Yong (2014) supported significant relationship between liquidity and firm debt-equity ratio.

2.2 Theoretical Review

In the literature several theories linked with capital structure, among them are: traditional theory, Modigliani and Miller theory, agency theory, signal theory, trade-off theory and pecking order theory. The anchor theories for this study are trade-off and pecking order theories. The trade-off theory propounded by Kraus and Litzenberg (1973) came to existence after criticism of irrelevant theory of capital structure by Modigliani and Miller. The theory expounds that firms should set up a debt target and moves towards it. This theory presupposes a goal debt ratio with trade-off between tax and other advantages in contrast with financial problems and other expenses as a result of use of borrowed capital (Lungard, 2018; Phooimng & Rahman, 2017). The debt target should be a point of trade-off between the expenses and advantages of debts. The theory states that firms will use debt as much as possible, but should watch out for disadvantages that may arise as a result of bankruptcy. The supporters of this theory assert that, after consideration of market impurity of taxes, bankruptcy expenses and agency expences, firms should balance the expenses and advantages of debt and equity financing so that they can reach the best capital structure mix. The theory supports the optimal capital structure of firms, provides ways to achieve optimal debt-equity mix and explains corporate debt level.

Pecking order theory propounded by Myers and Majluf (1984) expounded that firms usually

International Journal of Innovative Research in Accounting and Sustainability
ISSN: 2736-1381 (Print), ISSN 2736-1500 (Online)
Vol. 7, No. 1, 2022

IJIRAS/AAUA
https://ijiras.org

prefer to use more internal finance (equity) than external finance (debt). It elucidated that company's management usually follow rank of funds when selecting its financing structure and will fore choose shareholders' funds to external finance. If they need external finance, the sequence would be issue of long term loan and convertible debentures before raise of new equity shares. The theory adherent that firms that are generating adequate profit will be less indebted, due to the fact that they can fund their activities and new investments without raising additional equity shares or raise long term debt or debentures. The theory believed that the prime difficulty in ascertain firms' capital structure is unsymmetrical knowledge (Uremadu & Onyekachi, 2018). The theory admits the dynamics of the firms to determine their best capital mix at a given point in time and firms' best capital mix should be the role of internal cash movement and positive net present value of investment opportunities (Motobert, 2017).

2.3   Empirical Review

In the literature many past research works under saw connection between capital structure determinants and financial leverage of corporate organizations. Many of these studies presented results support positive connection between capital structure determinants and firms' financial leverage, while some research works reported adverse link between the two variables. A study by Yousef (2019) under sought the determinants of capital structure in the Gulf countries and United Kingdom. Author used sample of financial and market data of companies quoted on Gulf cooperation council and London stock exchange from 2000-2014. Six different types of debt measurements were employed by the study to capture financial leverage and seven factors were employed to capture determinant of capital structure. Data collected were analysis using panel and tobit regression models. Study results revealed that firm's size and firm's growth are strongly and significantly related with various debt measurements. Profitability, assets tangibility and firm's maturity are negatively and significantly correlated with various debt measurements for both Gulf cooperation council and United Kingdom.

Gunner (2016) used comparison method to test trade-off and pecking order theories in Turkish firms. Author employed data collected from 131 Turkish firms from 2008 to 2014. Total liabilities to total assets used to measure leverage, while profitability, liquidity, firm's size and growth rate utilised to measure firm's capital structure determinants. The empirical analyses of the study are conducted with the help of balance panel data regression. The study's regression results revealed an adverse and statistically essential connection between total liabilities to total assets and firm's size and liquidity. Profitability has a favourable and statistically insignificant link with total liabilities to total assets.

Sethi and Tiwari (2016) examined determinants of capital structure and financing decision undertaken by India manufacturing companies. Authors used sample of 1,077 India firms for the period of four years 2000 to 2013. Total liabilities to total assets used to capture leverage, while profitability, growth rate, firm's size, uniqueness, signal and assets tangibility are used to measure determinants factors of company's capital structure. The authors used panel vector auto-regression distribution lag to analyse data collected. Panel vector auto-regression results revealed that profitability, firm's size and signal have negative relationship with total liabilities to total assets, whereas growth rate, assets tangibility and uniqueness have positive relationship with total liabilities to total assets. Furthermore, the study divulged that selection of best capital structure of firms may be as a result of many factors, such as: liquidity, growth rate, firm's size, tangibility of assets and signal.

Anarfo (2015) observed the determinants of capital structure of banks in Sub-Sahara Africa

for period of fifteen years, 2000 to 2014. Data for the study were obtained from audited financial report and accounts of sample banks. Determinants of capital structure the explanatory variables are measured by: return on assets, assets tangibility, bank's size, bank's growth rate, tax rate and inflation rate. Data collected were analysed using fixed effect regression model. Fixed effect regression results showed that assets tangibility, growth rate and tax rate have vigorous and significant influence on financial leverage. Bank's size and inflation rate have negative and insignificant impact on sampled banks' financial leverage.

Anthony and Odunayo (2015) investigated major determinant factors of capital structure of quoted insurance companies in Nigeria, from 2006 to 2013. Financial leverage used as dependent variable, while six major determinants of capital structure were used as independent variables, they are: assets tangibility, growth, liquidity, risk, return on assets and firm's size. Panel data regression model employed by authors to analyse the data collected. The study's results revealed that growth rate, assets tangibility and liquidity have undesirable and considerable effect on leverage, while firm' size and risk have favourable and fundamental influence on leverage.

Bassey, Arean and Okpukpara (2014) investigated the determinants of capital structure of quoted agro-allied companies in Nigeria from 2005 to 2010. Sample of twenty-eight listed agro-allied companies in Nigeria stock exchange are used by the researches. The study employed simple regression model to analyse the data collected. Results of simple regression model indicated that assets tangibility and growth have strong and considerable effect on financial leverage. But assets tangibility and growth have adverse and ignorable impact on financial leverage of sampled companies.

Handoo and Sharma (2014) carried out study on most essential determinant factors of capital structure of quoted companies in Indian. The authors used sample of 870 listed companies comprising 618 private and 252 public firms from 2001 to 2010. The study used three variables to capture financial leverage and eight variables are engaged to measure capital structure determinants. The study's regression results revealed that profitability, tangibility of assets, growth, firm's size have important influence on total debt to shareholders' funds ratio and short-term debt to total capital ratio. Liquidity and tax rate have negligible impact on total debt to shareholders' funds ratio but have considerable influence on short-term debt to total capital ratio.

Another research work by Sayigan and Karabacak (2014) under saw impact of capital structure determinant factors on financial leverage of Turkish manufacturing firms. Authors used sample of 125 manufacturing Turkish companies quoted on Istanbul stock exchange from 2001 to 2012. Authors used leverage ratio as dependent variable, while specific determinant factors of company's capital structure were measured by non-debt tax shields, assets tangibility, profitability and firm's growth rate. Generalised method moment was employed to analyse data collected. Generalised method moment results of the study signified that firm's growth and non-debt tax have favourable and fundamental impinge on financial leverage. However, profitability and assets tangibility have negative and insignificant impact on financial leverage.

Chechet, Garba and Odudu (2013) conducted a study on capital structure determinants in Nigerian chemical and paint companies quoted in Nigeria stock exchange, from 2005 to 2009. Capital structure determinant variables captured by the study are: profitability, tangibility of assets, firm' growth, firm's size and firm, age used as independent variables. Financial leverage captured by total debt to shareholders' funds, used as dependent variable.

International Journal of Innovative Research in Accounting and Sustainability
ISSN: 2736-1381 (Print), ISSN 2736-1500 (Online)
Vol. 7, No. 1, 2022

IJIRAS/AAUA
https://ijiras.org

Data analysis was done using multiply regression model. Study's results found that profitability and tangibility of assets have negative and substantial influence on financial leverage of sampled firms at 5% significant level. The sizes of the firm, age of the firm and firm's growth have positive and inconsiderable effect on sampled companies' financial leverage.

Review of previous studies on capital structure determinants and financial leverage revealed that there are dearth empirical studies focused on listed industrial companies in Nigeria. Most of the few studies on Nigeria used sample of listed cement companies, agro-allied companies, banks, chemical and paint companies and insurance companies (Alabi & Olujinmi, 2018; Anthony & Odunayo, 2015; Bassey, *et. al.,* 2014 and Chechet *et al.,* 2013). This research work wants to fill this vacuum by contributes to the existing research works on capital structure determinants and financial leverage use sample of quoted industrial firms in Nigeria. Based on gap identified from former research works, the aim of this research paper is to investigate influence of capital structure determinants on firm's financial leverage with precise reference to quoted industrial firms in Nigeria.

Based on the review of literatures, the following hypotheses were formulated:

H_{o1}: Profitability has no impact on financial leverage of quoted industrial companies in Nigeria.

H_{o2}: Assets tangibility has no influence on financial leverage of industrial companies in Nigeria.

H_{o3}: Size of the firm has no effect on financial leverage of quoted industrial companies in Nigeria.

H_{o4}: Growth rate has no impact on financial leverage of quoted industrial companies in Nigeria.

H_{o5}: Age of the firm has no effect on financial leverage of quoted industrial companies in Nigeria.

H_{o6}: Default risk has no influence on financial leverage of quoted industrial companies in Nigeria.

H_{o7}: Earnings per share has no impact on financial leverage of quoted industrial companies in Nigeria.

3. Data and Methods

This research work utilized *ex-post facto* research design to examine influence of capital structure determinant factors on firm's financial leverage. Secondary data gathered from financial statements of sampled companies for a period of 2010 to 2020 was used in this study. Population of the study consists of all the 27 industrial companies quoted on Nigeria stock exchange as at 31st December 2020. Purposive sampling technique was chosen to select companies that meet the requirements of this research study. Sample size of 15 listed companies that have up till date financial records under industrial companies' category were selected. The study used fixed effect regression model to analyses data collected. These are employed in order to assess spread of variables, characteristics, extent of connection among variables and impact of individual explanatory variables on dependent variable.

IJIRAS/AAUA
https://ijiras.org

3.1   Model Specification

Based on models of Bland (2019) and Nassar (2016) stated as;

Bland model;

$$Y_{it} = \alpha_0 + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where: Y= Leverage, X1= Growth, X2= Profitability, X3= Liquidity, X4= Firm Age.

Nassar model:

$$FILE_{it} = \alpha_0 + \beta_1 TANA_{it} + \beta_2 FSIZ_{it} + \beta_3 PROF_{it} + \beta_4 FGRO_{it} \dots\dots\dots\dots\dots\dots\dots (2)$$

Where: FILE= Financial Leverage, TANA=Tangible Assets, FSIZ=Firm Size, PROF= Profitability, FGRO= Firm Growth.

Modified econometric model of this study expressed as:

$$FNLE = \beta_0 + \beta_1 (PROF)_{it} + \beta_2 (ASTG)_{it} + \beta_3 (SZEM)_{it} + \beta_4 (GWRA)_{it} + \beta_5 (AGFM)_{it} + \beta_6 (DFRK)_{it} + \beta_7 (EAPS)_{it} + \varepsilon t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)$$

Where: FNLE = Financial Leverage, PROF = Profitability, ASTG = Assets Tangibility

SZFM = Size of the Firm, GWRA= Growth Rate, AGEM = Age of the Firm,

DFRK = Default Risk, EAPS = Earnings Per Share,

β_0 = Intercept of relationship in the model/constant.

$\beta_1 - \beta_7$ = Co-efficient of individual variable.

i = Number of sampled firms.

t = Period or number of years covered by the study.

εt = Error team.

4.   Data Analysis and Discussion of Findings

4.1   Descriptive Statistics

As exhibited in Table 1, listed industrial companies in Nigeria financial leverage mean value is 0.365, with lowest worth of 0.013 and highest value is 0.898. This shows that total debt used by most of the sampled companies is more than 36% and equity used is more than 63%. This implied that sampled companies prefer use of equity to use of debt. Sampled companies' profitability lowest and highest values are -0.185 and 0.386 respectively, with average worth of 0.196. The average worth 0.196 implied that for every ₦1 investment of sampled companies in companies' assets generate return of more than 19k. The range of assets tangibility is from 0.009 to 12.461, with average figure of 0.387. This showed that on average, listed industrial companies' tangible assets in relation to total assets is more than 38%. The size of firm has a mean value of 5.012, while lowest figure is 3.984 and highest figure is 9.114.

Furthermore, Table 1 results also showed that growth rate has average value of 0.125, with smallest value -0.452 and largest value 0.677. The standard deviation of 0.315 indicated that there is much dispersion around the average sampled companies' growth by more than 31%. Age of sampled firms ranged from more than 13 years to more 26 years, with an average age of more than 15 years. The standard deviation of age of sampled companies which is 7.169 implied that age (which is measured in term of number of years since incorporation) is not widely dispersed away from mean value. Default risk has a mean value of -6.592, while minimum and maximum values are -15.258 and 8.812 respectively. Earnings per share average value is 0.874, with smallest worth of -0.079 and largest worth 2.558.

Table 1: Descriptive Statistics

Variables	Observation	Mean	Minimum	Maximum	Standard Deviation
FNLE.	150	0.365	0.013	0.898	0.318
PROF.	150	0.196	-0.185	0.386	0.179
ASTG.	150	0.387	0.009	12.461	0.310
SZFM.	150	5.012	3.984	9.114	1.329
GWRA.	150	0.125	-0.452	0.677	0.315
AGFM.	150	15.293	13.630	26.248	7.169
DFRK.	150	-6.592	-15.258	8.812	5.680
EAPS	150	0.874	-0.079	2.558	1.023

Source: Authors' Computation, 2022

4.2 Correlation Analysis

Table 2 displayed correlation matrix results. Results of the technique showed direction of relationship among the variables employed by this research study. Table 2 results revealed that profitability has a adverse connection with financial leverage of sampled firms (-0.095) and significant at 5% level (0.013). This is finding agrees with Pecking order theory that concluded that companies use few external sources of finance (debt) when profit is increasing, that is increase in profitability would lead to decrease in debt financing.

Assets tangibility has favourable link with financial leverage (0.102) and significant at 5% level (0,046). This implied that increase in company's tangible assets in total assets lead to rise in long term debt. Also, it confirms that tangible assets which would serve as collaterals perform crucial part in raising long-term debt. This showed that increase in tangible assets increased financial leverage of sampled firms for the period covered by the study. Size of the companies has vigorous connection with financial leverage (0.243) and also important at 5% significant level (0.036). This result is in consonance with static trade theory that confirmed that big companies likely to have better borrowing capacity than small companies. The link between growth rate and financial leverage is favourable (0.185) but statistically insignificant (0.163). This indicates that as companies expand, its debt financing would also increase.

Furthermore, the connection between firm's age and financial leverage is established to be positive (0.169) and substantial at 5% level (0.040). This implied that increase in number of years of firm in business increased in debt financing of firm. Default risk has undesirable association with financial leverage (-0.416) and its negative link is insignificant (0.138). This implied that increase in default risk decreased financial leverage of sampled companies. Earnings per share has negative correlation with financial leverage (-0.337) and significant at 1% level (0.001). This shows that increase in earnings per share decreases debt financing of sampled company. Table 2 also revealed that profitability has a favourable and moderate link with size of firm and earnings per share with (0.416) and (0.569) respectively and significant at 1% level (0.001) and (0.003) respectively. Assets tangibility has positive and moderate correlation with growth rate (0.346) and significant at 1% level (0.001). However, Table 2 also divulged that correlation coefficient values of all the variables considered by this research work are less than 0.80, the threshold suggested by Gurajati and Porter (2009). This implied that there is absence of multicollinearity in this work, since none of independent variables has a correlation coefficient above 0.80.

IJIRAS/AAUA
https://ijiras.org

Table 2: Correlation Matrix

Variables	FNLE.	PROF.	ASTG.	SZFM	GWRA	AGFM	DFRK	EAPS
FNLE.	1							
PROF.	-0.095	1						
	(0.013)							
ASTG.	0.102	-0.326	1					
	(0.046)	(0.014)						
SZFM.	0.243	0.416	0.201	1				
	(0.036)	(0.001)	(0.002)					
GWRA.	0.185	0.182	0.346	0.205	1			
	(0.163)	(0.046)	(0.001)	(0.003)				
AGFM.	0.169	0.194	0.218	0.405	0.154			
	(0.040)	(0.021)	(0.036)	(0.001)	(0.102)	1		
DFRK.	-0.416	-0.047	-0.064	0.081	0.013	-0.164	1	
	(0.138)	(0.142)	(0.137)	(0.164)	(0.090)	(0.083)		
EAPS.	-0.337	0.569	-0.317	0.281	0.184	0.210	-0.031	1
	(0.001)	(0.003)	(0.001)	(0.000)	(0.084)	(0.075)	(0.152)	

Source: Authors' Computation, 2022

4.3 Diagnostic Tests

Although correlation coefficient values of independent variables in correlation matrix showed the absence of multicollinearity, this research work still exploited variance inflation factor and tolerance values to examine presence of multicollinearity among variables used in this study.

The results of variance inflation factor and tolerance values for individual explanatory variable indicated absence of multicollinearity problem in the variables used since calculated variance inflation factor values for the explanatory variables are less than 10, the rule of thumb of Gujarati and Porter (2009). Also, computed tolerance values for each explanatory variable that is consistently greater than 0.10, the threshold of Gujarati and Porter (2009) buttress no multicollinearity problem and also indicated that the model is suitable for the study, Likewise, the result of Breusch-Pagan chi-square of 0.496 with probability of chi-square which is 0.145, which is not significant at 5%, indicated the absence of heteroscedasticity problem in the variables of this study.

The summary of restricted pooled OLS model and unrestricted (fixed effect and random effect) model in Table 4 indicated that unrestricted (fixed effect and random effect) model surpass restricted pooled OLS model. Since F-statistics and R-square values of unrestricted (fixed effect and random effect) model of 14.7398, 12.4562, and 0.5262 and 0.4816 respectively higher than F-statistics value and R-square value of restricted pooled OLS model of 11.1784 and 0.4386. The unrestricted model was subjected to Hausman test in order to ascertain whether fixed effect model is better than random effect model or vice-versa. Hausman test results favour fixed effect model, since calculated chi-square statistics is 5.9834 with p-value of 0.0286, which is less than 0.05. Therefore, results of fixed effect regression model were reported.

Table 3: Diagnostic (Multicollinearity and Heteroscedasticity) Test Results

Test	Independent and Control Variables	Variance Inflation Factor Value (VIF)	Tolerance Value (1/VIF)
Multicollinearity Test	PROF	3.41	0.716
	ASTG	3.16	0.962
	SZFM	2.52	0.604
	GWRA	1.98	0.673
	AGFM	3.64	0.735
	DFRK	2.07	0.681
	EAPS	3.36	0.790
Heteroscedasticity Test	Breusch-Pagan	Chi-square (1) = 0.496.	Prob. (Chi-square) = 0.145

Source: Authors' Computation, 2022

Table 4: Model Selection Test Results

	Restricted	Unrestricted	
	Pooled OLS Model	Fixed Effect Model	Random Effect Model
R-Square	0.4237	0.5262	0.4816
Adjusted R- Square	0.3941	0.4319	0.4006
F-statistic	11.1784	14.7398	12.4562
Prob. (F-statistic)	0.0008	0.0001	0.0002
Durbin-Watson	1.6907	1.9885	1.8513
Hausman Test	Chi-Square Statistics = 5.9834,	p-value = 0.0286	

Source: Authors' Computation, 2022

4.4 Capital structure determinants and financial leverage

The fixed effect regression model results in Table 5 revealed that profitability has undesirable and considerable influence on financial leverage with β-value of -0.1386 and p-value of 0.0002. This implied that when profitability increased by 1%, financial leverage of sampled companies decreased by 13.86%. This finding showed that as sampled companies' profitability moved upward, their financial leverage moved downward. Asset's tangibility has positive and substantial influence on financial leverage with β-value of 0.1947 and p-value of 0.0021. This implies that when tangible assets of sampled companies increased by 1%, their total debt to shareholders' funds increased by 19.47%. This showed that increase in tangible assets make access to long-term debt easier. Firm size has favourable and fundamental effect on financial leverage of sampled companies with β-value of 0.0685 and p-value 0.0026. The β-value indicated that increased in size of the company by 1% caused their financial leverage to increase by 6.85%. This demonstrated that increased in firm's size increased financial leverage of listed industrial firms in Nigeria.

The influence of growth rate on financial leverage is positive and not statistically significant with β-value of 0.0943 and p-value of 0.0865. This implied that 1% increase in growth rate caused financial leverage to increase by 9.43%. This implied that growth rate has impinged on financial leverage of sampled firms, but the impact is insignificant. The β-value and p-value of age of companies are 0.0426 and 0.0219 respectively. This showed that firm's age has strong and considerable effect on financial leverage of sampled companies. It implied that as the year of incorporation of sampled firms increased by a year, proportion of their total debt to shareholders' funds increased by 4.26%. This indicated that the more the age, the higher the debt-equity ratio of the sampled companies. Default risk has adverse impact on financial leverage of quoted industrial companies and adverse impact is significant. This can be confirmed from the β-value of -0.0129 and p-value of 0.0383. This implied that when default risk increased by 1%, total debt to shareholders' funds decreased by 1.29%. This showed that increased in default risk caused decreased in financial leverage of sampled companies. Earnings per share has undesirable and important influence on financial leverage, with β-value of -0.0952 and p-value of 0.0166. This revealed that increased in

International Journal of Innovative Research in Accounting and Sustainability
ISSN: 2736-1381 (Print), ISSN 2736-1500 (Online)
Vol. 7, No. 1, 2022

IJIRAS/AAUA
https://ijiras.org

earnings per share by 1% caused financial leverage of sampled companies to decrease by 9.52%. This implied that earnings per share has substantial impinge on total debt to shareholders' funds of sampled companies.

Moreover, Table 5 also revealed adjusted R-square value of 0.4319, which implied that capital structure determinant factors considered in this study jointly contributed 43.19% to financial leverage of listed industrial companies in Nigeria. This also suggested that all independent variables captured in this study responsible for more than 43% variation in dependent variable. Consequently, it divulged that explanatory power of model used in this research study is sound. F-statistics value of 14.7398 with probability value of 0.0000 revealed that all independent variables have substantial influence on financial leverage of sampled companies. Durbin-Waston value of 1.9885 is close to the benchmark of 2 implied non presence of first order serial correlation problem in the model and also demonstrated absence of auto-correction problem in the model.

4.4.1 Test of Hypotheses

Table 5 revealed that profitability has adverse and significant impact on financial leverage. Therefore, hypothesis H_{o1} which stated that profitability has no impact on financial leverage of quoted industrial companies in Nigeria rejected and alternative hypotheses accepted. Profitability has impact on financial leverage of quoted industrial companies in Nigeria. This outcome consistent with research works of Aljaman (2018), Olokoyo (2013) and Phooimng & Rahman (2017) empirically and supports pecking order theory. It was also found that asset tangibility has positive and substantial influence on financial leverage. Therefore, hypothesis H_{o2} rejected and alternative hypothesis accepted. Asset tangibility has substantial influence on financial leverage of quoted industrial companies in Nigeria. This finding supported outcomes of studies of Adigiwe & Oregue (2019), Khanyu & Darmar (2017) and Shuaibu (2016) and in corroborated the trade-off theory.

The result revealed that firm's size has favourable and fundamental effect on financial leverage. Therefore, hypothesis H_{o3} rejected and alternative hypothesis accept. Size of the firm has fundamental effect on financial leverage of sampled companies. This is in consistent with studies of Awwal (2017), Goyal (2013) and Twairesh (2014). When considering hypothesis four, growth rate has no significant impact on financial leverage. Hence, hypothesis four is accepted which stated that growth rate has no impact on financial leverage of quoted industrial companies in Nigeria. This result is in consonance with the studies of Nassar (2016), Habibu & Soddiqi (2017) and Yousef (2019).

Age of the firm has considerable influence on financial leverage. Hence, H_{o5} rejected and alternative hypothesis accepted. Age of the firm has strong effect on financial leverage of sampled quoted industrial companies in Nigeria. This result confirmed the findings of Awwal (2017), Khanyu & Darmar (2017) and Shuaibu (2016). Default risk has adverse impact on financial leverage. Therefore, H_{o6} rejected and alternative hypothesis accepted. Default risk has strong influence on financial leverage of sampled companies. This is in agreement with research works of Blobork (2018), Lungard (2018) and Sheikh & Wang (2013). Earnings per share has important influence on financial leverage. Therefore, H_{o7} rejected and alternative hypothesis accepted. Earnings per share has impact on financial leverage of quoted industrial companies in Nigeria. This result supports the findings of Gunner (2015), Moodi & Saheed (2015) and Shuaibu (2016).

Table 5: Results of Fixed Effect Regression Model

Independent Variables:	Coefficient	Std. Error	t-Statistic	Prob.

Constant	0.2814	0.1279	2.2002	0.0194
PROF.	-0.1386	0.0221	-6.2715	0.0002
ASTG.	0.1947	0.0454	4.2885	0.0021
SZFM	0.0685	0.0120	5.7083	0.0026
GWRA	0.0943	0.0175	5.3886	0.0865
AGFM	0.0426	0.0132	3.2273	0.0219
DFRK	-0.0129	0.0054	-2.3889	0.0383
EAPS	-0.0952	0.0766	-1.2428	0.0166
R-Square		0.5262		
Adjusted R-Square		0.4319		
F-Statistic		14.7398		
Prob. (F-Statistic)		0.0000		
Durbin Watson Stat.		1.9885		

Source: Authors' Computation, 2022

5. Conclusion and Recommendations

This research work explored capital structure determinant factors and financial leverage of quoted industrial companies in Nigeria for period of ten years, 2010 to 2019. Unlike some of past research studies total debt to shareholders' funds was used to capture financial leverage, while profitability, firm's size, growth rate, firm's age, default risk, assets tangibility and earnings per share were variables considered by this research work as major determinant factors of firms' capital structure.

The study's regression results showed that firm's age, assets tangibility and firm's size have positive and substantial influence on financial leverage. The growth rate has positive but insignificant impact on financial leverage. Profitability, earnings per share and default risk have adverse and important impinge on financial leverage of sampled quoted industrial firms. Collectively all variables considered as main determinant factors of firm's capital structure have strong and considerable effect on financial leverage of sampled firms. Furthermore, results of this research work revealed that sampled listed industrial companies employed more internal finance (equity) than external finance (debt) to finance their activities and pecking order theory best explained capital structure pattern of sampled quoted industrial companies.

Based on findings, this research work recommends that sampled quoted industrial firms in Nigeria should use the three main determinant variables of capital structure that have positive and significant impact on financial leverage (assets tangibility, firm's size and firm's age). This should be utilized as a yardstick in determining their capital structure, which would assist them to operate at optimum level of capital structure which would minimize their cost of capital and maximize their returns. Also, management of sampled companies should use more debt capital to finance their business activities, since value of company would improve when more debt capital is used than equity capital.

References
Abiodun, B.Y. (2014). Triangulation analysis of capital structure and firms' performance in Nigeria, *International Proceedings of Economics Development and Research Journal, 69*(12), 75-82.
Adigwe, O.N., & Oreque, T.D. (2019). Capital structure and corporate performance in Nigeria: an empirical investigation, *Journal of Management Sciences, 5* (3), 52-71.
Alabi, K.O., & Olujinmi, A.H. (2018). Capital structure and industrial performance in Nigeria.
Aljaman B.E. (2018). Capital structure: definitions, determinants, theories and link with performance, literature review, *European Journal of Accounting, Auditing and Finance Research, 6*(2), 49-72.

Anarfo, I.M. (2015). Cross-country determinants of capital structure: a survey of Sub-Saharan countries, *Journal of International Business Research, 11*(3), 121-148. https://lupinepublishers.com/journal/fulltext

Anthony, E.C., & Odunayo, B. S. (2015). Capital structure and financial performance of listed insurance firms in Nigeria, *Journal of Finance and Management Sciences, 2* (3), 10-26.

Awwal, S.M. (2017). Capital structure and performance of selected quoted companies in Nigeria, *International Journal of Economics and Finance, 9*(2), 28-42.

Bassey, P., Arean, O., & Okpukpara T. (2014). Determinants of capital structure of listed agro-allied firms in Nigeria, *Journal of Financial Management, 6*(2), 103-126.

Bland. E.A. (2019). The impact of capital structure choice on firm performance, empirical evidence from Norway, *Journal of Finance, 3* (2), 477-487. https://www.ijhssnet.com/journal 201914

Blobork, T.H. (2018). The effect of capital structure on profitability: an empirical analysis of listed firm in Gambia, *Global Journal of Business Research, 6*(1), 72-86.

Chechet, A., Garba, J., & Odudu, N. (2013). Optimal financial policy and firm's valuation, *Journal of Finance, 3* (4), 315-329. https://www.scienpress.com/upload/jfia

Disaqu, P.A. (2016), Capital structure and financial performance: evidence from selected business firms, Colombo Stock Exchange Market, Sri Lanka, *Journal of Arts, Science and Commerce, 2* (2), 171-185.

Goyal, A.M. (2013). Impact of capital structure on performance of listed public sector in India, *International Journal of Business and Management Invention, 2(*10), 35-43.

Greenwood, M. R. (2016). How persistent is the impact of market timing on capital structure? *Journal of Social Management, 61* (3), 1681-1695.

Gujarati, D.N. & Porter, D.O. (2009). *Basic econometrics,* International Edition, London: McGraw-Hill.

Gumey, N. P. (2019). Determinants of capital structure for Japanese multinational and domestic Corporation, *International Journal of Finance, 9* (4), 26-43. https://www.sciencedirect.com

Gunner, A. (2015). The determinants of capital structure decisions: new evidence from Turkish companies, *Journal of Economics and Finance, 38* (2), 84 -89.

Habibu, S.K., & Soddiqi, A, M. (2017). Measuring Performance through capital structure: evidence from banking sector in Pakistan, *International Journal of Business Management, 5*(3), 1781-1798.

Handoo, A., & Sharma, K. (2014). A study on determinants of capital structure in India, *Journal of Management Review 26* (1), 170-182. https://www.sciencedirect.com

Horvathova, J., & Mokrisova, M. (2017). Capital structure modelling and analysis of its impact on business performance, *Journal of Social Sciences,5*(3),78-94. https://www.doi.10581/fai201722/riesit

Khanyu, T.B., & Darmar, V. T. (2017). Capital structure and financial performance: evidence from India financial market. *Journal of Economics and Business 2*(5), 57-68.

Lungard, A.T. (2018). The determinants of leverage of the listed textile companies in Portugal, *European Journal of Business and Management, 3*(2), 54-67.

Manata, S.T. (2016). Ownership structure and corporate performance: evidence from Taiwan selected companies, *Journal of Humanities and Social Sciences, 3* (1), 24-32.https://www.bpf.org/resources/PIA-2016

Meida, P.H., & Pellotic, M.C. (2019). Financing frictions and the substitution between internal and external funds, *Journal of Financial and Quantitative Analysis, 45* (3), 589-622.

Moodi, A. H., & Saheed, K. T. (2015), Capital structure and firm performance: Evidence from Iraqi companies, *International Research Journal of Economics, 12*(3), 162-175.

Motobert, R. H. (2017). A capital structure model, *Journal of Investment Management and Financial Innovations, 4* (2), 8-26. https://yetrstic.org/researchpaper/10.1290379/pdf

Nassar, S. (2016). The impact of capital structure on financial performance of the firms: evidence from Bosra, Istanbul, *Journal of Business and Financial Affairs, 5* (2), 173-189.

Oboh, S.C., & Adekoya, A.C, (2012). Corporate capital structure and corporate market value: empirical evidence from Nigeria, *International Journal of Economics and Finance, 4*(12), 193-201.

Olaniyi, T.A., Elelu, M.O., & Abdulsalam, T. S. (2015). Impact of capital structure on corporate performance: a pre and post crisis evaluation of selected companies in United States, *International Journal of Accounting Research 2* (8), 78- 99.

Olokoyo, F.O. (2013). Capital structure and corporate performance of Nigerian quoted firms: a panel data approach, *African Development Review, 25* (3), 358-369.

Phoonimng, J.G., & Rahman, M. O. (2017). The determinants of capital structure: evidence from public listed companies in Malaysia, Singapore and Thailand, *Journal of Economics and Finance, 5* (1), 81-102.

Sayigan, G., & Karabacak, H. (2014). The firm specific determinants of corporate capital structure: evidence from Turkish, *Journal of Investment Management and Financial Innovations, 3* (3), 125-139.

Sethi, P., & Tiwari, R. (2016). New evidences on determinants of capital structure from Indian Manufacturing industry, *Corporate Ownership and Control Journal 13* (3), 82- 88.

Sheikh N.A., & Wang. Z.Y. (2013). The impact of capital structure on performance: an empirical study of non-financial listed firms in Pakistan, *International Journal of Commerce and Management, 23* (4), 354 -368.

Shuaaibu, H. (2016). Determinants of capital structure in Nigeria deposit money banks, *Journal of Management Studies,7*(2), 1105-1120.http://www.ftpl.hmtpro/ubdoliko.kadunastateuniversity/ng/astm.

Songlean, K.C., & Moyer, W.H. (2019). Culture, capital structure and firms' performance: evidence from European's retailers, *Journal of Business Research, 50* (2), 185-197.

Soumadi, M.M., & Hayajneh, O. S. (2018). Capital structure and corporate performance: empirical study on the public Jordanian shareholding firms listed in the Amman Stock Market, *Journal of Financial Economics, 5* (2) 149- 166.

Twairesh, A.M. (2014). The impact of capital structure on firms' performance evidence from Saudi Arabia, *Journal of Applied Finance and Banking 4* (2), 183-193.

Uremadu, S., & Onyekachi, O. (2018). The impact of capital structure on corporate performance in Nigeria, quantitative study of consumer goods sector, *International Research Journal of Economics, 7*(3), 20-26.

Xiaomengs, X., & Yong, H. (2014). An empirical study of the relationship between capital structure and financial performance based on neural network analysis, *International Journal of Business and Social Science, 5*(4), 42-53.

Yao, A.B., Chiu, L. T., & Gano, T. K. (2019), Does capital structure affect operating performance of credit cooperate in Hong Kong, *Journal of Finance and Economics, 32*(1), 21-36.

Yousef, I. (2019). The determinants of capital structure: evidence from GCC and UK real estate sectors, *Journal of Real Estate Management and Valuation, 27* (2), 108-125.https://doi.10.2478/remav-2019-0019