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Abstract

It is impossible to overstate the significance of integrating debt and equity financing decisions in enhancing and maintaining corporate performance. Conflicting predictions and arguments on whether capital structure promotes or hinders a firm's success are provided by capital structure theories. Since Myer (1984) created the pecking order theory and empirically tested it as a replacement for the trade-off theory in response to the harsh criticism and restrictions of Miller and Modigliani's (1958) capital structure theory. Numerous researches have been conducted in both developed and emerging economies, making a substantial contribution to the discussion and yielding contradictory results. There aren't many studies conducted in Nigeria that used a reliable approach like the Generalized Method of Moments (GMM) to examine the viability of the pecking order theory in the banking industry. Against this background this study examines the pecking order theory of capital structure of deposit money banks listed on the Nigerian bourse, on a panel data set; of twelve (12) banks spanning through 2010 to 2019. The System GMM methodology within static panel was adopted. Findings revealed all the variables considered conform to A priori expectations. Specifically, profitability (ROA) and firm size (FSIZE) have significant negative relationship with capital structure at 5% confidence level. Firm's age and asset tangibility positively and significantly impact capital structure during the period under review. Finally, growth opportunity has a non-significant positive relationship with capital structure of DMBs in Nigeria during the period. The study concludes that financing decision of DMBs follow hierarchy need of which occupied first order determinant in their financing behavior in Nigeria. Thus, the applicability of the pecking order theory in capital structure decision in the Nigerian DMBs is valid and strongly followed.

Keywords: *Pecking Order Theory, Capital Structure, DMBs, Trade-off Theory, Financing*

Introduction

In finance literature, the pivotal role of financial management cannot be down played, because efficient and effective fund management is required by all firms for sustainable operations (Panda, 2006). However, due to various reasons the perception on what is the best way to source funds differs. The insufficient level of financing means is linked with reduction in business operation. Hence, the firm's Capital Structure (CS) is determined in advance with respect to divergent available sources to the firms (Igbinosa & Chijuka, 2014).

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Miller and Modigliani (1958) and other new variant theories of CS like the Trade-off Theory (TOT), Pecking Order Theory (POT) and the Market Timing Theory (MTT) provides explanation on how firms demand their financing means and why some firms prefer more debt, or choose other various financing methods (Kalui, 2017). The actions directed to identify CS formation determinants in firms are effort to clarify capital structure which shows a dynamic attribute out of a static condition at the end of a specific period. Thus, coming up with different explanation for any variable like liquidity, firm size and firm age that is believed to affect capital structure with respect to firm performance becomes possible (Kalui, 2017). Capital Structure decisions remains and performs a fundamental role in all business operations. Thus, efficient sourcing of capital for firm's operational activities is seen as a salient decision for firms to determine and increase their performance. Hence, the correct debt-equity mix that maximizes shareholder's wealth while remaining profitable requires analyzing and investigating the determinants of capital structure (Kalash, 2019; Nguyen, Ho & Vo, 2019). Accordingly, Ugwu, Obasuyi, and Mbah (2019) opines that the internal factors include the determinants (age, size, tangibility, growth, and profitability) of CS and they are within the control of the firms, while the external factors, which are outside firm control, can be classified into political/legal, social, economic and technological. Although in Nigeria, achieving optimum capital structure expectation by banks has not been achieved and if this is the status quo, then it is to the detriment of both shareholders and the firm itself regarding its performance.

Research Problem

In corporate finance literature, CS has been extensively discussed theoretically and empirically, since the development of pecking order theory by Myer (1984), as an alternative to TOT due to the criticism of unrealistic assumptions and limitation of Miller and Modigliani (1958) theory of CS. In line with this, numerous studies have used these firm specific factors (CS determinants) to test the validity of POT in different sectors across different countries in the world. Prominent among these studies are Frank and Goyal (2003, 2009), Fama and French (2002), Khemiri and Noubbigh (2018), Goh, Tai, Rasli, Tan and Zakuan (2018), Vijayakumaran and Vijayakumaran (2018), Cevheroglu-Acar (2018), Kiraci and Aydin (2018), Kalash (2019), Nguyen, Ho and Vo (2019), Ugwu, Obasuyi and Mbah (2019), Sakr and Bedeir (2019), Rahman (2019), Uremadu and Onyekachi (2019), Ganiyu, Adelopo, Rodionova, and Olawale (2019). However, these studies offer mixed findings about capital structure decisions, since firm-specific factors do not have a particular direction of influence on CS. These mixed findings could be attributed to difference

in social-political-economic and cultural characteristics that is endemic in each country of study, difference in scope, variables measurement and estimation techniques adopted.

From the foregoing, it becomes glaring that studies that tested the applicability of POT in the banking sector's capital structure using firm specific (internal) factors are scarce in Africa and even worse in the case of Nigeria, hence a gap exist in the literature and more studies are needed in this direction. Hence, this study investigates the effects and validity of the pecking order theory in the Nigerian banking sector within the framework of system GMM. It is important to note that only the study of Ganiyu et al (2019) in Nigeria, Nuyen et al (2019) in Vietnam and Nenu, Vintila and Gherghina (2018) in Romanian used the Generalized Method of Moment (GMM) methodology in their study of CS decision on firm performance. However, in the case of Nigeria, only the study of Ganiyu et al (2019) used the two step GMM estimation techniques and the study focused on the CS decision of non-financial sector of the economy; as such the findings may not be consistent and interpreted the same with the banking sector because of the sector's peculiar characteristics of high risk. This is the gap in knowledge this study seeks to fill. Testing this theory in the banking sector is possible because there is presence of information asymmetry between inside managers and outside investors in financial markets and the banking sector is not left out. Hence, this study examines the validity and applicability of POT in the CS decision of Nigeria deposit money banks (DMB) listed on the Nigerian Exchange Limited (NGX) with a panel of data covering 2010 to 2019.

Objective of the Study

The main objectives of this study is to validate the pecking order theory among the Deposit money banks in Nigeria.

Literature Review

Theoretical Literature Review

Pecking Order Theory (POT)

POT was first explained by Thorleif Schjelderup-Ebbe in 1921, introduced by Donalson in 1961 and popularized by Majluf and Myers (1984) after criticizing the tradeoff theory in his presidential address. It is otherwise referred to as Pecking Order Model. POT was propagated by Myers and Majluf (1984) to debunk the existence of optimum CS and firm's manager prefer and chose internal financing for business and investment activities. The theory originates from information asymmetry assumption between

managers and outside investors. That managers inside have more information than outsides' investors about firm performance. Hence, managers behave in best interest of existing shareholders (Nirajini & Priya, 2013).

POT identified two main finance sources to firm's financial needs corresponding internal and external finance according to least effort. POT asserts internal finance (retained earnings and excess liquid asset) usage first before external finance. Inadequate internal financing for investment opportunities will attract the use of external financing. If this is done to lessen additional costs of asymmetric information, then firms prefer to adopt debt leverage first, followed by preferred stock and finally common stock issuance (Abosede, 2012). However, the POT failed to address tax shield effect and the theory ignore the challenges of excess financial slack (Acaravci, 2015). There are two variants of pecking order theory and this includes the weak form pecking order and the strong form pecking order. The former allows a little use of equity when there is need for more external fund when debt has been exhausted while the later do not consider provisions for the use of equity. That is, 100% debt finances. Pragmatically, researchers in developed and emerging economies have used and examine the impact of different firm specific factors, such; as profitability, firm size, firm age, asset tangibility and intangibility, growth opportunities, liquidity on leverage ratio to ascertain the applicability of POT in CS formation of firms (Anerfo, 2015; Akorsu, 2014; Frank and Goyal, 2003; Fama & French, 2002; Zhang & Kanazaki, 2007; Titman & Wessel, 1988).

However, this study follows and sticks to the POT. The theory was chosen because it is widely applicable, large and small firms also can apply it, and it predicts an indirect nexus between CS and firm performance.

Empirical Studies

Several empirical studies have focused on testing specific or general classes of models like the pecking order theory in attempt to ascertain the significant determinants of CS in a given country or environment. Fama and French (2002) prove inverse influence of leverage on profitability and investment. Direct association between leverage and firm size was also detected by them. Zhang and Kanazaki (2007) investigated the determinants of CS within POT and TOT framework using regression techniques in Japan. Larger firms with higher non-debt tax shield and tangible asset were found to possess more leverage, while profitability inversely influences leverage. Octavia and Brown (2010), Gropp, and Heider (2010) examined the determinants of CS of Asia banks adopting regression estimation techniques, findings show that

dividend payment, growth, firm size, profitability, bank guarantees and assets risks have significant impact on CS.

Chandrasekharan (2012) studied CS determinants among listed Nigerian firms for five years ranging from 2007 to 2011 using panel multiple regression and findings identified firm age as strong determinant of leverage among Nigerian firms. Vitor and Badu (2012) looked at CS impacton Ghana banks performance between 2000 and 2010, using panel regression estimation and discovered that firm age of the firm inversely influence leverage in a non-significant manner. Chechet, Garba and Odudu (2013) investigated CS determinants in the paint and chemical industry in Nigeria, from 2005 to 2009 using OLS panel regression method of data analysis and discovered that age has a non-significant effect on leverage of the firms. Akorsu (2014) used 26 financial Institutions in Ghana between 2005 and 2012 to test the POT and signaling theories. The model was estimated by adopting the panel data regression methodology. Findings show that age is directly related with leverage. Bassey, Arene and Okpukpara (2014) examined the determinants of CS of firms in Nigeria. Data for twenty-eight (28) agro-allied firms listed NGX between 2005 and 2010 were analyzed using the multiple regression OLS techniques. Findings indicate that firm age and long term debt ratio were positively related. Shala, Ahmeti, Berisha and Perjuci (2014) studied firm specific factors that determine the insurance firm's CS in Kosovo. Data from 11 insurance companies between 2009 and 2012 was examined using the panel Random Effect (RE) model. The result showed that firm age has significant and direct influence on the debt ratio. Guruswamy and Marew (2016) investigated CS determinants of listed insurance companies in Ethiopia using multiple regression analysis. Result indicates that CS is significant determinant of firm age. Oke and Obalade (2015) studied the determinants of capital structure in Nigerian oil industry for the period 2005 to 2012 employing pooled OLS, fixed and random effect model for analytical purpose. Findings show that age is a significant determinant of CS among Nigerian oil firms.

Guner (2016), and Burucu and Ondeş (2016) used pecking order model to determine the variables affecting CS decisions among Turkish firms. Descriptive statistic and regression estimation technique were adopted. Result point out that profitability, firm size and liquidity inversely impact leverage ratio. Erol, Aytekin and Abdioglu (2016) investigated factors that CS structure in Turkey. The regression result indicates high leverage in firm with more profit, liquidity, tangible asset and less growth opportunities. Thereby, confirming the validity of pecking order theory. Nassar (2016) examined the influence of CS on the

financial performance of industrial firms in Turkey during 2005 to 2012. A multivariate regression analysis was applied and results reveal an inverse significant nexus between CS and firm performance.

Nenu, Vintila and Gherghina (2017) studied CS drivers of firms in Romanian market. They adopted multivariate fixed-effects regressions, two-step system generalized method of moments (SGMM) on a panel data from 2000–2016. Leverage was found to directly correlate firm size and share price volatility. Contrarily, debt structure haddirect impact on firm performance. Kalui (2017) tested POT of CS applicability in Kenya for the period 2002 to 2009. Multivariate regression methodology was adopted for data analysis and hypotheses testing. Size, asset tangibility, profitability and non-tax shield were established to be determinants of CS and confirm the validity of the weak form POT in Kenya.

Nguyen, Minh-Ho and Hong-Vo (2019) examined variant factors affecting the CS decisions in Vietnam with 227 firm considered from 2008 - 2017. The Generalized Method of Moment (GMM) methodology was adopted. Findings revealed that firms in Vietnam follow the TOT to construct CS. POT evidence were not found in Vietnam financing decisions, as expected from the outset. Ganiyu et al (2019) studied CS effect on firm performance (FP) in Nigeria. A non-monotonic association between CS and firm FP as proposed by ACT of CS due to excessive use of debt was also tested. The dynamic panel model of two step Generalized Method of Moments (GMM) methodology was employed to analyze 115 non-financial firms. Findings shows that CS has significant impact on FP and evidence of monotonic correlation between CS and FP in this regard uphold the agency cost theory. Ogieva and Ogiemudia (2019) explored capital structure decision impact on the performance of Multinational Firms (MF) in Nigeria. Panel data of 2008 to 2017 were sourced from the Nigeria Exchange Limited (NGX), analyzed with descriptive statistic, ADF statistic, Levin, Lin and Chut statistics, correlation analysis and panel regression techniques. The findings reveal that CSD significantly and negatively impacts MFs' performance in Nigeria thereby confirming the validity of POT in the Nigerian listed multinational firms. Other explanatory variables of board size, firm age, firm size, and board independence considered were positively related to the performance though not significant (except for firm size).

Conceptual Framework

Financial performance

Financial performance can be described broadly as the ability to control and maintain investment, operational decisions and strategies to achieve a business' financial stability and objective. Specifically, bank financial performance is bank's capacity to generate sustainable profits. Return on Equity (ROE), Net Interest Margin (NIM), Return on Assets (ROA) and Tobins Q are the common measures of profitability (Chipa & Wamiori, 2017).

Capital Structure (CS)

CS is defined as debt and equity combination used by firms to finance their operations (Modigliani & Miller, 1958). CS is subset of a firm's financial structure (combination of long term and short term financing by firms to finance operations). According to Myers and Maljuf (1984), CS is choosing of hybrid, equityor debt securities for firms to finance their businesses. Thus, the two major components of capital structure correspond debt financing and equity financing.

Debt Financing

Debt financing infer raising funds via floating of riskless fixed income securities that carries fixed amount of payment like bonds, treasury bills, mortgages or direct borrowing from financial institutions.

Equity or Ordinary Share Financing

Equity aids firms to secure funds without using leverage and without repayment obligation at a specific future data (Ugwu, Obasuyi, & Mbah, 2019). It involves raising funds by issuing stocks to investors for investment purposes. In a certain stage of a firm's growth, external capital is needed by the firm which may be obtained via debtor equity. Also, exchanging firm ownership to investors with sales of firm stock in cash is part of equity financing, this is called ownership dilution. The part of the firm to be sold is a function of owner's investment and investment worth during financing time (Uremadu, et al, 2019).

Schematic Diagram

The diagrammatic illustration of the nexus between firm's specific variables and the capital structure is given in figure 1.
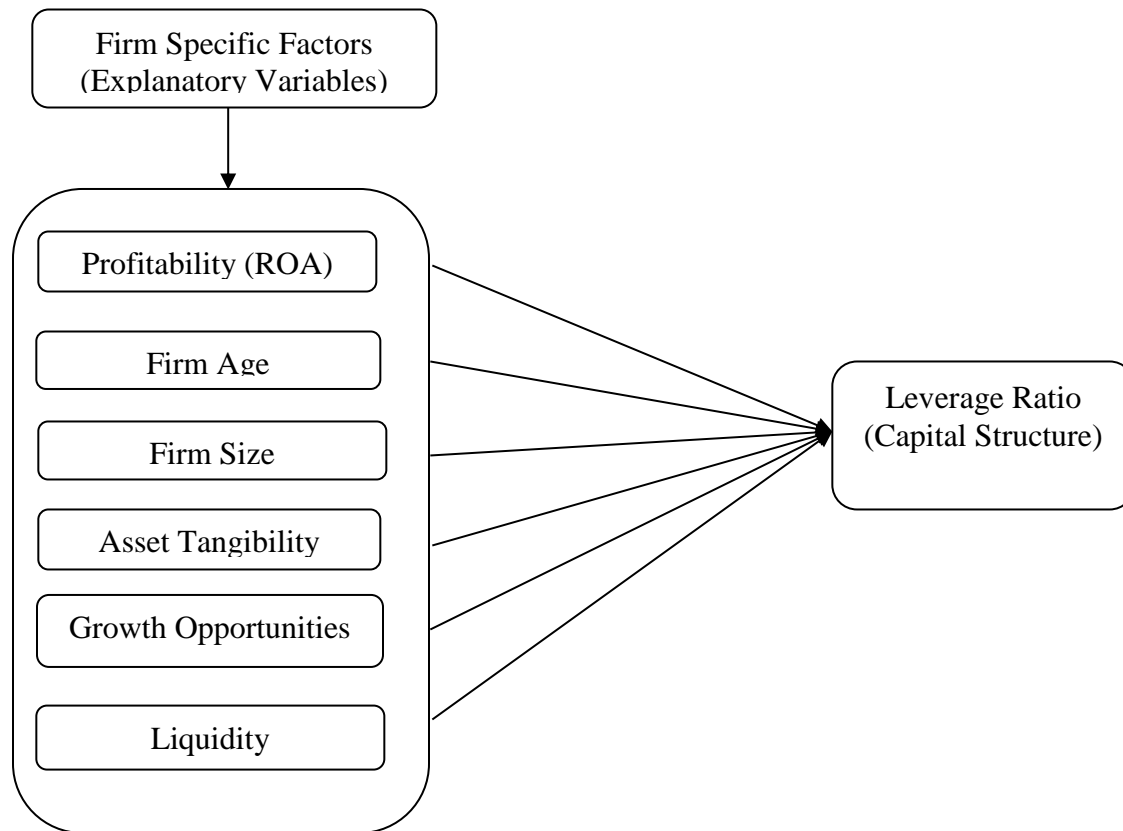
Research Gap

From the empirical studies on POT reviewed, it is deduced that mixed findings about the application of POT in the CS decisions of firms in Nigeria exists. In terms of scope and methodological gap. And, since asymmetry information exist between managers (agent) and external investors (Myers, 1984) and the banking sector is not left out; it becomes imperative to use firm specific factors of profitability, firm age, firm size, asset tangibility, growth opportunities and liquidity to ascertain applicability and the extent to which DMBs follow POT in their CS formation in Nigeria, using a more robust estimation techniques of system GMM forms the gap in knowledge this study intends to fill.

Research Methodology

This study adopted the longitudinal survey research design which is a sub-type of expost-factor research design. This type of research design becomes imperative because the variables under interest were gathered over a period of time and they are historical in nature, hence cannot be manipulated by the researcher. All the Fifteen (15) Deposit Money Banks (DMBs) listed on the Nigerian Exchange Limited (NGX) as at December 31st 2019 (NGX, 2019) constitutes the population of the study. All data were sourced from each DMBs statement of account as published by the annual fact book of NGX 2019. The variables of interest are six (6) firm specific factors from literature reviewed and these includes Firm Age (FAGE), Firm Size (FSIZE), Asset Tangibility (ATANG), Growth Opportunities (GRTOPT), Liquidity (LQDTY), Profitability and Capital Structure (CAPST) from 2010 to 2019, these sum up to 140 observations adequate enough to take care of the degree of freedom.

Model Specification

This study adapted Frank and Goyal (2003) model and carefully followed their steps to substitute their variables with firm age, firm size, asset tangibility, growth opportunities, liquidity, profitability and CS as used by researchers. To suit the objectives of this study, CS (proxy by leverage ratio) is modeled as a function of other explanatory variables (firm age, firm size, asset tangibility, growth opportunities, liquidity and profitability) to ascertain the validity and the extent to which DMBs in Nigeria follow POT in forming CS. Thus, the functional forms of the models are given as:

$$CAPST_{it} = \mathfrak{f}(PRFTY, LQDTY, GRTOPT, AGE, FSIZE, ATANG) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . (1)$$

The estimated version of the model with standard assumptions given as:

$$CAPST_{it} = \alpha_0 + \delta_1 PRFTY_{it} + \delta_2 LQDTY_{it} + \delta_3 GRTOPT_{it} + \delta_4 FAGE_{it} + \delta_5 FSIZE_{it} + \delta_6 ATANG_{it}$$
$$+ e_i \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . (2)$$

Where:

PRFTY = Profitability

CAPST = Capital Structure

LQDTY = Liquidity

GRTOPT = Growth Opportunity

FAGE = Firm Age (Bank Age)

FSIZE = Firm Size (Bank Size)

ATANG = Asset Tangibility

i represents each bank in the sample and t represents the period of the study.

α_0 = Constant

$\delta_1$toδ_6 = Parameters to be estimated

A priori expectation of Eq. (2) as derived from theoretical literature is given as;

$$\delta_1, \delta_2, \delta_5 < 0 \; while \delta_3, \qquad \delta_4 and \; \delta_6 > 0$$

Fama and French (2002), Frank and Goyal (2003),   Titman and Wessel (1988), Ozkan (2021) amongst others used similar approach in the literature. From the POT point of view, it is important to emphasize here that POT exist in DMBs CS decision when the coefficient of PRFTY (δ_1) is negatively related to CAPST. If all the variables conform to *A priori* expectation in Eq. (2) then this study will infer that DMBs in Nigeria follow a strong form (no room for equity finance) of POT suggestion in their CS decision, otherwise, the study will infer that DMBs CS follows the weak form (room for some levels of equity finance) POT when some of the variables conform to *A priori* expectation. However, if all the variables in Eq. (2) fail to conform to *A priori* expectation, then the POT is not applicable in the Nigeria DMBs sector. Furthermore, if the coefficients of δ_1 is significant we infer that POT is the first order determinants (hierarchy of financing choice is the priority) driving capital structure in DMBs. Else, hierarchy of financing choice may not be the priority driving CS decision when the variables are not significant. Other considerations such as determining optimal CS may be the first order determinant driving CS in the Nigeria DMBs.

Operationalization of Variables

The definition and measurement of both explained and explanatory variables in the model, their corresponding expectations (signs) and source of data are provided in table 3 below.

Table 1: Definition, measurement and source of variables

Variables	Definition and Measurement	Expected Sign	Source
Variable Type = Dependent			
Capital Structure (CAPST)	Proxy by leverage = $\frac{Total\ Debt}{Total\ Asset}$Titman and Wessels (1998), Syham, sunder and Myers (1999) used it in their study.		NGX Annual Publication of sampled banks
Variable Type = Independent			
Profitability (PRFTY)	Proxied by Return on Asset (ROA) = $\frac{Profit\ After\ Tax}{Total\ Asset}$	Negative	NGX Annual Publication of sampled banks
Liquidity	LQDTY = $\frac{Total\ Liquid\ Asset}{Total\ Asset}$	Negative	" "

Asset Tangibility	$ATANG = \frac{Total\ non-Current\ Asset}{Total\ Asset}$ Murray, Vidhan and Goyal (2003) used it in their study.	Positive	""
Growth Opportunities	GRTOPT = Ratio of market to book value.	Positive	""
Firm Size	FSIZE = Natural Logarithm of Total Asset	Negative	""
Firm Age	FAGE = Year of listing – 1	Negative	""

Method of Data Analysis

Descriptive statistics, correlation analysis and panel co-integration test constitute the preliminary tests of this study. Furthermore, this study used the system GMM estimation to test the robustness of the POT as well as to measure the cause-effect of different internal factors on CS decisions of Nigeria's DMBs'. System GMM is used because it caters for the obstacle of omitted variables, endogeneity of explanatory variables with dependent variable, heterogeneity drawbacks endemic with cross-section data and measurement biases (Kannadhasan, Thakur, Gupta & Parikshit, 2018). Hence, the system GMM possess the ability to make estimation more proficient and efficient.

Data Presentation and Analysis

Data Analysis of Sample Firms

The presentation, analysis and interpretation of the data stream collected for this study is the focus of this section.

Table 2: Summary Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.
CAPST	88.16550	86.15000	254.7500	8.630000	22.45347	4.767766	35.31036	5674.430	0.0000
ROA	1.595250	1.460000	9.540000	-9.53	2.275349	-1.134874	10.89845	337.6865	0.0000
FAGE	25.05000	18.50000	50.00000	6.000000	15.32277	0.360098	1.449094	14.61995	0.0007
FSIZE	9.113472	9.100000	10.77000	8.190000	0.422397	0.301604	3.846905	5.405536	0.0670
ATANG	3.453861	3.160000	13.74000	0.250000	1.832048	2.330405	11.56706	475.5887	0.0000
GRTOPT	13.72812	13.46000	99.44000	-65.94	22.74670	0.273109	5.341003	28.65247	0.0000
LQDTY	13.97497	13.61000	34.32000	0.580000	7.344559	0.227996	2.527014	2.158217	0.3399

Note: PRFTY = ROA   Source: Researcher's Estimation using E-views 11.0 (2023)

The proportion of mean to median is almost one in table two. There is a meaningful difference between maximum and minimum values for all the variables. This shows that our sample firms considered vary in different aspects For instance, some firms contributed to ROA while others reduce ROA during the studied

period. Also, in size and age, these firms are different. Only ROA skewed to the left of its mean with a long tail as shown by its associated value of 1.135 that is negative. Other variables skewed to the mean right hand with a long tail as indicated by their corresponding positive values. FAGE has a flat distribution property that is relative to normal, because its Kurtosis value < 3.0. The Kurtosis value for LQDTY is 3.0 approximately, this indicates early signal that the variable is normally distributed. Other variables exhibit peaked distribution property since their values are > 3.0 and this is relative to normal distribution. Normality distribution of the variables is by the Jarque-Berra statistics. Only LQDTY and FSIZE are normally distributed since their corresponding probability values are not significant at 5% level of confidence. However, the estimation techniques adopted in this study does not require the model variables to be normally distributed in order to produce efficient estimate.

Table 3: Correlation Matrix

Correlation t-Statistic Probability	CAPST	ROA	FAGE	FSIZE	ATANG	GRTOPT	LQDTY
CAPST	1.000000						

ROA	-0.114307	1.000000					
	-1.244580	-----					
	0.2158	-----					
FAGE	0.049166	-0.151035	1.000000				
	0.532450	-1.652648	-----				
	0.5954	0.1011	-----				
FSIZE	-0.384109*	0.202209	0.152425	1.000000			
	-4.499973	2.233360	1.668223	-----			
	0.0000	0.0274	0.0979	-----			
ATANG	0.425602*	-0.075305	-0.132634	-0.635948	1.000000		
	5.087348	-0.816865	-1.447440	-8.913502	-----		
	0.0000	0.4157	0.1504	0.0000	-----		
GRTOPT	-0.229288*	0.010593	-0.046408	0.009982	-0.226171	1.000000	
	-2.548010	0.114582	-0.502523	0.107977	-2.511490	-----	
	0.0121	0.9090	0.6162	0.9142	0.0134	-----	
LQDTY	-0.034370	0.110216	0.082992	0.386544	-0.403861	0.149854	1.000000
	-0.371990	1.199471	0.900808	4.533503	-4.775177	1.639434	-----
	0.7106	0.2328	0.3695	0.0000	0.0000	0.1038	-----

* = 1% Significant Level   Source: Researcher's Estimation using E-views 11.0 (2023)

Table three shows the strength and direction of association between the explained and explanatory variables. FAGE and ATANG are positively associated with CAPST with the correlation coefficient of r = 0.049 and r = 0.426. However, only the nexus between ATANG and CAPST is significant at 5% confidence level. This means that increase in these variables will increase the debt ratio of DMBs in the banking sector during the studied period. Other variables (ROA, FSIZE, GRTOPT and LQDTY) have an inverse nexus with CAPST. However, only the correlation coefficient of FSIZE = -0.38 and GRTOPT = -0.23 were significant. This means that increase in these variables significantly reduces leverage use during the sample period vice-versa. Also, LQDTY = -0.034 and ROA = - 0.11 is not significant. This means that increase in these variables result to non-significant in reduction of leverage ratio during the sample period. The highest correlation coefficient value stood at r = -0.64 between ATANG and FSIZE. This shows the absence of multi-colinearity among the explanatory variables. However, in the strict sense, correlation does not necessarily indicate causality and functional dependence test; thus, regression analysis is further carried out to ascertain cause-effect relationships.

Table 4: Kao Panel Co-integration Test Result

Variable	ADF Statistics	Prob	Remark
Residual (ADF)	-2.135659	0.0164**	Co-integration exist

** =5% Significant Level.*Source: Researcher's Estimation using E-views 11.0 (2023)*

Table four revealed the Kao co-integration test which ascertained whether long run relationship exist between the variables of interest in the long run. Since the calculated ADF statistics of all the variables evaluated into a single value of -2.14 approximately and it is significant at 5%. This means that there is a co-integrating relationship between the variables as the variables converge to long run equilibrium after short run shock.

Table five below shows that the instrument validity is confirmed to be satisfactory; since the J-Stat (Sargan test) probability value of 0.75 > 0.25 with reported instrument rank of 9 as suggested by Roodman (2009). Thus, the instruments used are exogenously related to the error term and satisfy the orthogonality conditions for their use. AR (2) is reported and the non-significant AR(2) implies the absence of second order serial correlation as required for a GMM estimation. The Wald tests show that all the explanatory variables significantly influence CAPST jointly when taken together. That is, one of the coefficient estimates is

significantly different from zero. Only GRTOPT fail to pass significance test; since it prob. Value is > 0.05. Other variables pass their individual significant test, because their corresponding prob. Value is < 0.05. The result in table 4.4 further reveals that all the explanatory variables affected CAPST of DMBs in Nigeria in different magnitude. ROA, FSIZE and LQDTY affected CAPST negatively while other variables positively affected CAPST during the period under review.

Table 5: System GMM Result

Dependent Variable = CAPST			
Variables	**Coefficient**	**T-stat**	**Prob.**
ROA	-2.307243*	-3.184114	0.0021
FAGE	5.714553*	5.862538	0.0000
FSIZE	-73.57563*	-8.667175	0.0000
ATANG	12.45684*	5.981774	0.0000
GRTOPT	0.012488	0.192322	0.8480
LQDTY	-1.266727**	-2.159297	0.0340
Model Summary (diagnostic Tests)			
J-Stat	1.2046		0.7519
AR(1)	-0.803109		0.4219
AR(2)	-0.981291		0.3264
Wald Test	17.74946		0.0000
No.of Inst. Rank	9		

*, ** = 1% & 5% Significance Level. Inst. = Instrument
Source: Researcher's Estimation using E-views 11.0 (2023)

All the variables considered in the model influenced CAPST directly and indirectly in different degree. They all confirm to A priori expectation as suggested by the Pecking order (PO) theory and they are significant except for GRTOPT. First, ROA has a significant negative relationship with CAPST at 5% confidence level. This implies that increase in ROA significantly reduces leverage level in the CAPST of Nigerian DMBs. That is DMBs in Nigeria possess a highly profitable rate and they maintain low leverage ratio in their CAPST decision; since such funds can be internally generated. Thus, DMBs in Nigerian follow the POT in their CAPST decision, which makes POT valid and applicable in the Nigerian DMBs. This finding is in line with that of Fama and French (2002), Nassar (2016), Goh, Tai, Rasli, Tan and Zakuan (2018) in the literature that significant inverse relationship exists between profitability and leverage as suggested by the POT.

Second, Firm's Age (FAGE) positively and significantly impact CAPST during the period under review. This conforms to A priori expectation and means that increase in age of banks increases the level of debt in their CAPST. This behavior is induced because firm's age is the standard measurement of reputation. As FAGE increases the continuous business operation of the firm and its capacity to absorb more debt is increased. Hence, there is direct nexus between FAGE and CAPST in line with POT. This finding corroborates that of Akorsu (2014), Bassey, Arene and Okpukpara (2014), Shala, Ahmeti, Berisha and Perjuci (2014), Chandrasekharan (2012) in the literature who found that firm age directly and significantly impacts debt ratio. However, the finding is contrary to that of Vitor and Badu (2012) in the literature.

Third, firm size (FSIZE) has significant inverse effect on leverage ratio of banks in Nigeria at 5% confidence level. This finding tally with POT prediction because high earnings are peculiar with large firms; due to their high level of diversification which discourage them from using more debt as financing option. Titman and Wessel(1988)also find similar result in their study that FSIZE is a significant determinant of CAPST. However, this position is contrary to the findings of Nenu, Vintila and Gherghina (2017), Vijayakumaran and Vijayakumaran (2018), Kalash (2019) in the literature that firm size can be seen as an inverse proxy for bankruptcy, thus positive nexus exists between FSIZE and CAPST.

Also, asset tangibility (ATANG) conforms to A priori expectation as predicted by the POT. It exacts significant direct effect on leverage ratio (CAPST). This shows that increase in ATANG increases DMBs debt ratio during the studied period. This is so because tangible asset of DMBs in Nigeria is high and this can aid them to meet their financial obligations as they fall due and these assets can be used as collateral for more debt. This finding conforms to that of Erol, Aytekin and Abdioglu (2016), Cevheroglu-Acar (2018), Vijayakumaran and Vijayakumaran (2018) in the literature that asset tangibility is a significant determinant of leverage ratio. Furthermore, growth opportunity (GRTOPT) is in line with the A priori expectation but not significant as proposed by the POT. This means that GRTOPT has a non-significant positive relationship with CAPST of DMBs in Nigeria during the period. This implies that a unit increase in GRTOPT will result to non-significant increase in DMBs leverage ratio. The non-significance of this variable could be attributed to the fact that most of the big banks in Nigeria used low leverage to finance their investments opportunity. This position conforms to that of Guner (2016), Burucu and Ondeş (2016), Kalash (2019) who found in the literature that GRTOPT is a significant driver of CAPST. However, this finding is contrary to that of Kiraci and Aydin (2018) in the literature.

Finally, liquidity (LQDTY) has a significant negative impact on Leverage ratio (CAPST) and this conform to A priori expectation. This shows that a unit increase in LQDTY will spur debt ratio of DMBs in Nigeria. This finding is in tandem with the finding of Guner (2016), and Burucu and Ondeş (2016), Kiraci and Aydin (2018) in the literature that liquidity significantly reduces debt financing in capital structure. This position does not agree with that of Erol, Aytekin and Abdioglu (2016) in the literature. Also, all the variables conforming to A priori expectation have strong policy implication that the POT is not just applicable in the CAPST decision of DMBs in Nigeria; it is applied in strong form because it occupied the first order determinants in the CAPST decision of the sampled banks considered. Indicating that DMBs in Nigeria are more concerned about prioritizing financing source to maximize shareholder's wealth due to information asymmetry; rather than looking for optimal capital structure by trading off between benefit of debt financing and cost of debt financing to maximize shareholder's wealth. This finding is in tandem with that of Kalui (2017), Cevheroglu-Acar (2018)Vijayakumaran and Vijayakumaran (2018), Kalash (2019), Rahman (2019), Ogieva and Ogiemudia (2019) in the literature who also confirmed the applicability of POT in the CAPST decision of firms in developed and emerging economies in the literature.

Conclusions and Recommendations

The pecking order theory proposes that firms are more likely to stick to a funding hierarchy than to stick to debt-to-equity ratio goal. This they do by preferring internal financing first, and if external financing need arise; firms issue the safest protection first. They begin with debt, and then consider hybrid securities like convertible bonds, and finally, equity as a last resort. This study examines the pecking order theory of capital structure of deposit money banks listed on the Nigerian bourse. Panel data of twelve (12) banks spanning 2010 to 2019 respectively were collected from the audited annual publications of each firm as published by the NGX. Several statistical tests and econometric techniques of System GMM methodology within static panel were adopted.

Findings revealed all the variables considered conform to A priori expectation. Specifically, among other things, profitability (ROA) and firm size (FSIZE) have significant negative relationship with capital structure at 5% confidence level. Firm's ageand asset tangibility positively and significantly impact capital structure during the period under review. Finally, growth opportunity has a non-significant positive relationship with capital structure of DMBs in Nigeria during the period.

From the foregoing analysis, this study concludes that financing decision in Nigerian DMBs follow hierarchy need of financing which occupied first order determinant in DMBs financing behavior in Nigeria; rather than optimal capital structure objective as propounded by its counterpart theory of trade-off and agency theory. Thus, the applicability of the pecking order theory in capital structure decision in the Nigerian DMBs is valid and strongly followed.

From the findings of the study, the following recommendations are made: Firstly, managers of DMBs are urged to strengthen and build their trusting relationships with outside investors to reduce asymmetry information and agency cost between both parties in order to increase cash inflow and retained earnings (liquidity) that will discourage the use of debt financing choice in the sector. Secondly, regulatory authorities like the CBN should implement policies which would increase firm's cash flow and reduce cost of debt and bankruptcy risk in the financial service sector to signal investors that banks are independent financially. Thirdly, firms in financial service sector lacking collateral (asset tangibility) should be assisted by the government to increase banks capacity to absorb debt. Fourthly, managers should be effective and efficient in using their asset (size) to generate more income for adequate internal fund availability. Also, policy makers and market regulators should make and facilitate appropriate policy directed at improving information environment with state of the art ICT technology. Lastly, debt finance should only be used by DMBs that are relatively small in size to finance positive Net Present Value (NPV) project in the face of growth opportunity.

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