Gauging The Dependence Of Financial Performance On Assets Structure In The Nigerian Banking Industry

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Abstract

This paper examines the interaction of asset structure and financial performance in the largest banking system in Africa – Nigeria, using data from 1996 to 2022. Five leading banks in the system with national, regional and international spread were used for the study. Results from the panel estimation reveal that asset structure has a positive and significant impact the financial performance of the studied banks. Earning assets like loans and advances were found to be the major contributors to financial performance over other operational assets like non-current assets. We argue that managers and regulators of banks should give attention to the asset mix of banks for the imperatives of enhancing earnings, liquidity and stability of the banks as well as the system at large.

Keywords: *Current Asset, Return on Assets, Non-current Assets, Panel Estimation, Deposit Money Banks.*

INTRODUCTION

Banking institution assets comprise earning assets and non-earning assets. The non-earning components of deposit money banks (primary reserves) comprise distinctively planned deposits with the Cent[1]ral Bank of Nigeria, where no interest may be obtained, but must be kept based on instructions from the monetary authorities. This may also include non-current assets for operational enhancements and not for revenue generation. The earning assets compose of interest deposits from regional and international acquaintance banks, safe cash, and cash in transit from deposit money banks, as well as credit balances from other deposit money banks. Asset structure is necessary to devise the comparative degrees and assets quality used to describe banks' monetary status. From the perspective of deposit money banks (DMBs), the fundamental concept of asset structure is that it forms the primary means to evaluate the potential incomes and applicable liquidity status of banking institutions (Hałaj, 2018).

According to extant literature, there are three financial structures in the financial statements of every deposit money bank. These comprise of the asset structure, the liability structure, and the capital structure. A bank's asset structure determines the structure of the asset levels that are significant for its successful performance. Considering Schmidt's (2014) evidence, asset

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structure is a combination of current assets, fixed assets, investments, as well as intangible and other assets.

Deposit money banks (DMBs) perform significant roles in economic support. The major role of the deposit money banks is the ability to assemble resources and constantly direct the same to investors, where investible funds are built in pursuit of economic growth and development. This economic role can be achieved when these deposit money banks make sufficient profits while managing their operational costs. To achieve this competitiveness and lucrativeness, deposit money banks' asset structure performs a meaningful function. It serves as a dominant donor for the deposit money banks' earnings, liquidity and profitability.

In the past, researchers have attempted to explain how deposit money banks maintain their record of financial status (that is, their balance sheet), and designate reserves to assets of different categories (Stoughton & Zechner, 2017). There is a need to comprehend this process against the backdrop of its influence on the financial performance of these banks. Some renowned scholars recommend beneficial measures like income maximization (Acharya & Thakor 2016), and risk-adjusted maximization (Stoughton and Zechner, 2017; Danielsson, et al, 2018). Hataj (2018) suggests an optimization-based method for deposit money banks' asset structure in different theoretical and functional circumstances. It is an essential part of the asset management and liability management resolution method, which can also combine asset structure deliberation with interest in optimization design (Adam, 2018; Kusy & Ziemba, 2019; Darrack, Halaj & Kok (2016); and Amadi & Eyo, 2019).

It is obvious that asset structure is an essential management decision area as it affects the equity return of owners considerably, the risk of owners, and the market value of shares. Specifically, how a bank is funded is significant for the directors of deposit money banks, as well as for those who provide the finance. It implies that when a disproportionate mix of finance is used, the achievement and continuation of the company performance may be grievously afflicted. Nevertheless, firms' investment arrangements represent a broad scope of management problems that may be outside of the immediate administration of directors. From a macro level, there is an activation of suggestions for interest rates, capital market development, and consideration of security resolution, and control (Green, Murinde, & Suppakitjarak, 2022).

The deposit money banks' profit is essentially achieved through the interest on its acquired revenue assets (credits and expenses). This has triggered several investigative activities into the assets structure and financial performance nexus at different jurisdictions. Yahaya and Andow (2021) from Nigeria, Hanran and Wenshou, (2014) from Hong Kong, Gladys and Job (2017) from Kenya, as well as and other researchers have investigated the influence of asset structure on the performance of deposit money banks..

However, in spite of these works, there remains a need to use current empirical evidence to validate the findings of previous studies. There are developments in test statistics that seem to have overtaken those used by previous authors, which makes this study a marked departure from prior studies. Also, this study focuses on the largest financial system in Africa, which is Nigeria, with close to thirty (30) deposit money banks and multi-trillion dollars in capital and asset bases. Investigating this will aid generalization for the African sub-region, given that Nigeria's financial system accounts for a preponderating percentage of the continent's banking system. In addition, Nigeria's banking system is intricately networked with the global financial system. Several banks in Nigeria are quoted in other stock exchanges, while some have also become multinational in outlook with branches both in countries within and outside of Africa.

Based on the foregoing, this study examined the impact of asset structure on the performance of selected deposit money banks in Nigeria, using panel data sets from 1996-2022. The research utilized return on assets for the financial performance of listed deposit money banks in Nigeria, while the components of asset structure included cash holdings, total assets, securities investment, deposit mobilization, current assets, loans and advances and non-current assets (independent variables). The study acknowledges certain limitations, including the availability and accuracy of financial data, potential changes in regulatory requirements over the study period, and external macro-economic factors that may influence financial performance.

Following the introduction, the rest of the paper is structured as follows: review of literature; the study's methodology; the results; and conclusion.

LITERATURE REVIEW

The financial performance of banks is a paramount factor to determine their stability, growth, and competitiveness within the financial sector. Among the myriad of elements that influence financial performance, the composition of a bank's assets is crucial (Terefe, 2019). Financial performance considers the extent to which financial goals have been accomplished. It is the method of estimating the outcomes of an organization's strategies and services in financial terms (Tiendem, 2020; Sathyamoorthi & Dzimiri, 2020).

Financial performance can be evaluated by using ratios such as liquidity, profitability and investment or shareholders' ratio (Gamayuni, 2015 & Petria, 2015). Some of these ratios can be linked to the rate of return for a firm, which is the rate at which the company can attain its sustainable growth rate (Hamilton & Asundi, 2018).

Commonly, return on asset estimates effectiveness in the employment of assets to create profits and the greater this ratio, the more the efficiency of management in utilizing its assets to generate profits. It also represents the ratio of earnings on the assets base; that is, the quotient of net profit over all the assets (Santoso & Ariefiantoro, 2019).

Figure 1 below presents the conceptual framework for this investigation, which links return on assets to the different components of the asset structure.
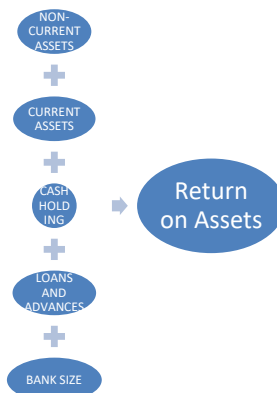

Figure 1: Model of Asset Structure and Financial Performance
(Source Authors' Fieldwork)

Numerous theories exist that attempt to explain asset structure and financial performance. Traditional Portfolio Theory provides an insight into financial investments to build a meaningful combination of assets within a portfolio. Earlier in Markowitz's study 2024, the focus of investors was on appraising the opportunity and interest of different bonds in building their portfolios. It is clear that the idea was to increase portfolio return by choosing several low risks with unusual yield stocks to decrease the risk connected to any assets (Darok, 2012). Asset allocation and structuring techniques tend to strengthen the traditional portfolio approach (See Scherer 2007, Brandt 2010 and Peñaranda 2007). Other theories, including the balanced portfolio theory, the pecking order theory, the trade-off theory, and the agency cost theory have all improved on the traditional portfolio proposition, with a view to identifying the need for adequate capital and asset structure for optimal performance.

Empirically speaking, many scholars have studied the nexus between the financial performance of banks and the asset structure, and they all concluded differently. Umobong and Agburuga (2019), Terefe (2019), Lončar and Svilokos (2021) and Ekpo and Mbobo (2016) found that non-current assets, investments, intangible assets, and current assets all have a positive and statistically significant impact on return on assets, while Al-Ani (2018) discovered that asset structure does not have a significant influence on profitability.

A summary of more empirical studies in the asset structure and financial performance nexus is presented in table 1 below:

Table1: Summary of Empirical Review

S/No	Author(s)	Year (s)	Area of Study	Title/Focus	Methodology	Findings
1	Muchiri, Muturi, and Ngumi	2016	Nigeria	Evaluating the effect of capital structure on firm performance in Vietnam within the period 2007-2012	Regression Analyses	The results showed that both book leverage and market leverage have negative relation with firm performance.
2	Akingunola, Olawale, and Olaniyan	2017	Nigeria	Capital structure and the performance of non-financial firms	Panel Regression Analyses	Findings showed that the ratio of short-term debt to total asset, debt to equity (TD/TE) had negative and significant effect on ROA while short-term debt to total asset, and long-term debt to total asset had positively significant positive
3	Mwaniki and Omagwa	2017	Kenya	Investigating the Effect of asset structure on financial performance of quoted commercial and services firms in the Nairobi Securities Exchange.	Panel Regression Analyses	The result showed that noncurrent assets and long-term investments had a statistically significant impact on profit performance.
4	Lee and Phan	2017	Nigeria	The impact of capital structure on firms' performance	Regression Analyses	The result of the study showed a negatively significant relationship between leverage and performance.
5	Setiadharma	2017	India	Effect of asset structure and firm size on firm value spanning 2010-2014	Panel Regression Technique	From the result, while there was a positive effect of asset structure on the firm value; firm size had no effect on firm value.
6	Ukhriyawati, Ratnawati, and Riyadi	2017	India	Influence of asset structure and capital structure on performance	Regression Technique	Findings of the study showed that asset structure had a positively significant effect on earnings, while capital structure

						exert a negative and significant influence on earnings.
7	Zhang and Dong	2018	USA	Asset structure as a determinant of Bank Profitability: Evidence from US Banking Sector	Regression Technique	Asset related ratios like liquidity ratio, asset equity ratio etc had determining effects on profit indicators like EPS, ROA, ROE, profitability (profit margin)
8	El-Abiad and El-Chaarani	2019	Bangl adesh	Evaluation of Asset Structure and Firm's Financial Performance in a Developing Country	Regression Technique	Findings of the study showed that debt and equity ratio had a combined effect on the ROA while debt and equity ratio did not have significant impact on ROE and EPS as financial performance indicators.
9	Hossain, Khan and Khalid	2019	USA	Capital structure impact on firm performance in different economic sectors	Regression Technique	The result showed that in all the three sectors of health, energy and industrial sector, Capital structure had a negative relationship with return on assets and operating return.
10	Paramasivan and Subramanian	2019	USA	Financial structure and financial performance of Firms Listed at East Africa Securities Exchanges covering 2005 - 2007.	ex post facto	Insignificant relationship between asset structure, short and long term debt, and equity with ROA positively significant relationship with ROE.

Authors' Fieldwork

There is no consensus around the relationship between asset structure and the financial performance of banks; not only in Nigeria but in other jurisdictions too. Recent studies that focus on developing economies are rare, but even more so are those that consider the disaggregation of assets into earning and non-earning assets. Therefore, this study set out to fill this gap by investigating the asset structure and financial performance of listed deposit money banks, using recent data sets, whilst focusing on the disaggregated influence of asset components on profit performance.

METHODOLOGY

This study used secondary data, which is longitudinal in nature. The secondary data sets were collected from the Central Bank of Nigeria's statistical bulletin and the annual reports of the studied banks. The study covered the period 1996 to 2022. The selected period was considered to be adequate to provide comprehensive information about trends and sufficient variable movement, necessary for evidence-based conclusions. The banks were selected following a purposive/judgmental approach. Consideration was given to banks in Nigeria with national, regional and international spread. These included the Guaranty Trust Bank Plc., the First Bank Nigeria Plc, the United Bank of Africa Plc., the Union Bank of Nigeria Plc., and the Zenith Bank Plc. The data was panel based, as included cross sections (banks) and covered a period of time (1996-2022).

In specifying our model, Ukhriyawati, Ratnawati, and Riyadi (2017), Simon (2010), and Xu and Xu (2018) provided empirical benchmarks with the necessary modifications to suit the topic and the isolated variables of interest. The basic relationship modelled in this study is thus expressed as:

$$ROA = \beta_0 + \beta_1 CHD + \beta_2 NCA + \beta_3 CAT + \beta_4 BSZ + \beta_5 LNA + \varepsilon \qquad (1)$$

Where explanatory variables are: -

ROA   = Return on Assets
β_0 = Intercept or Constant term
β_1, to β_5 = represent estimated coefficient for selected Nigerian banks
CHD   =   Cash Holding
CAT   =   Current Assets
NCA   =   Non-Current Assets
LNA   =   Loans and Advances
BSZ   =   Bank Size (Total Assets)
ε =   Error term

It is expected that CHD, NCA, CAT, LNA, and BSZ have a positive impact on the financial performance of selected Nigerian banks. In other words, it is expected that β_1 to $\beta_5 > 0$

The following represent the study's estimation processes.
Firstly, a set of tests was used to prove the data set's effectiveness for the main econometric/statistical estimation of the study. The tests include panel descriptive statistics, panel correlational analyses and panel stationarity tests.

We employed four diverse types of panel unit root tests to measure the stationarity properties of the panel data set. These included Im, Pesaran and Shin –IPS (2003), Levin, Lee and Chu – LLC (2002), the Maddala and Wu (2011), that is the ADF Fisher, and PP Fisher Choi (1999). Secondly, the study adopted the fixed effect and random effect models as core estimation techniques, following the panel framework with the fixed effect model shown as equation (2), and the random effect shown as equation (3) below:

$$Y_{it} \;=\; \alpha + \; \beta x it \;+\; \lambda i + \; v_{it} \qquad (2)$$

λ_i is a time-varying intercept that captures all the variables that affect Y_{it} that vary over time but are constant in a cross-sectional form (Brooks, 2014).

$$Y_{it} \;= \alpha \;+ \beta x_{it} \;+\; w_{it}, w_{it} \;=\; \varepsilon_{it} \;+ \mu_{it} \qquad (3)$$

Where:
ε_{it} measures the random deviation from the global or common intercept term α,
μ_{it}= the regular error term

To select the more efficient model, we carried out the Haussmann test (See, Asteriou and Hall, 2007):

$$H_{stat} = (\beta^{FE} - \beta^{RE})'[Var(\beta^{FE}) - Var(\beta^{RE})]^{-1}(\beta^{FE} - \beta^{RE}) \sim X^{2(k)} \qquad (4)$$

H_o = Random Effects are better, more efficient and consistent
H_1 = Fixed Effects (LSDV) are better, more efficient and consistent.

Decision Rule for the Haussmann Test:
The null hypothesis was rejected as the evidence favoured the fixed effect model being more efficient than the random effect and vice versa.

RESULTS

The panel data set for this study shows all the cross sections (studied banks) and includes the endogenous variable, which is ROA, and the explanatory variables, which include Cash Holding, Fixed Assets, Current Assets, Total Assets, Deposit Money Banks' Size and Loans and Advances. The data set covers the period 1996 to 2022, drawn from the published financial statements of the investigated banks.

The Descriptive statistics of the panel datasets are reported in table 2:

Table 2: Summary of Basic Panel Descriptive Statistics

	Mean	Median	Max	Min	Std. Dev	Skew	Kurtosis	Jarque-Bera	CV
LBANKSIZE	14.73542	13.91696	22.12483	5.617476	3.164043	0.663	3.883468	11.75185	0.21
LCASHOLD	13.62599	12.24143	20.01644	10.02473	2.964812	0.8386	2.263179	14.54163	0.22
LLADV	13.53786	12.92700	21.07198	7.345365	3.510450	0.656	2.684674	8.655737	0.26
LROA	-3.425340	-3.622432	3.474319	-7.237175	1.494327	1.684	9.138595	212.4165	0.46
LSECINV	11.24976	11.75637	18.71430	5.030438	2.989987	0.169	2.901140	0.512165	0.27
LTCA	15.64894	14.96210	22.94198	11.19845	2.979315	0.883	2.901908	14.20459	0.19
LTFA	12.28079	11.34220	19.22513	8.145550	2.981528	0.936	2.859857	15.85843	0.24

Source: Authors' Fieldwork

Table 2 above depicts the measures of central tendency (median and mean), the measures of dispersion (minimum, maximum and standard deviation,), and the test for normality (skewness

and kurtosis). These statistics show the spread and centrality of the used observations. Giving particular attention to the relative standard deviation, which is a quotient of the standard deviation over the mean, it can be inferred that all the variables are properly distributed with minimal cases of observed outliers. The fact that all the coefficient of variations fall below unity (1) suggests that the panel series are exposed to less distributional problems.

Table 3 below illustrates the correlational properties of the panel series, as seen in the directional bivariate correlational matrix.

Table 3: Panel Correlational Matrix

	LADVS	LBANKSIZE	LCASHOLD	LLADV	LROA	LSECINV	LTCA	LTFA
LBANKSIZE	0.613	1.000	0.781	0.886	-0.060	0.759	0.872	0.872
LCASHOLD	0.459	0.781	1.000	0.850	0.437	0.661	0.876	0.890
LLADV	0.580	0.886	0.850	1.000	0.263	0.876	0.892	0.889
LROA	0.030	-0.060	0.437	0.263	1.000	0.272	0.315	0.329
LSECINV	0.502	0.759	0.661	0.876	0.272	1.000	0.850	0.842
LTCA	0.611	0.872	0.876	0.892	0.315	0.850	1.000	0.964
LTFA	0.599	0.872	0.890	0.889	0.329	0.842	0.964	1.000

Authors' Fieldwork

The panel bivariate correlational analyses are presented in Table 3, showing various degrees and directions of linear association among the studied panel series. The results show that all the explanatory variables were found to share a positive correlation with Return on Assets. This empirical evidence reveals that in all the cross sections, loans and advances, bank size, cash holding, investment in securities, and total fixed and current assets all share positive linear association with the performance of the five studied Nigerian banks..

The stationarity properties of the panel series were evaluated through a collection of panel unit root tests, as reported in Table 4 below:

Table 4: Summary of Panel Unit Root Tests

VARIABLES	LADVS		LBANKSIZE		LCASHOLD		LLADV		LROA		LSECINV		LTCA		LTFA	
	T-STAT	INF	T-STAT	INF	T-STAT	INF	T-STAT	INF	T-STAT	INF	T-STAT	INF	T-STAT	INF	T-STAT	INF
LLC	2.469	I(1)	-3.890	I(0)	-5.177	I(0)	0.042	I(1)	-5.992	I(0)	-3.177	I(0)	-12.086	I(0)	-7.047	I(0)
Breitung	0.211	I(1)	0.226	I(1)	-3.414	I(0)	-1.053	I(1)					-4.416	I(0)	-3.881	I(0)
IPS	-3.882	I(0)	-5.677	I(0)	-2.071	I(0)	-2.425	I(0)	-4.563	I(0)	-4.273	I(0)	-9.938	I(0)	-6.642	I(0)
ADF-FISHER	34.31	I(0)	22.433	I(0)	29.467	I(0)	22.748	I(0)	33.684	I(0)	40.242	I(0)	86.443	I(0)	50.418	I(0)
PP-FISHER	277.815	I(0)	10.163	I(1)	111.210	I(0)	49.900	I(0)	25.138	I(0)	39.797	I(0)	91.045	I(0)	45.120	I(0)

LLC= Levin Lee and Chu, IPS = Im, Pesaran and Shin; Philip Peron-Fisher & Augmented Dickey Fueler- Fisher.

Authors' Fieldwork

All the panel series were tested for stationarity, as reported in Table 4 above. There is a combination of different stationarity tests for cross sectional dependence and cross-sectional independence. The results showed stationarity properties that are consistent with the deployed panel estimation techniques. The results revealed nothing to suggest that the panel estimation tests would show any spuriousness.

Table 5 below illustrate results of the panel regression estimates, following the fixed and random effects framework.

Table 5: Summary of Panel Regression Results

Variable	Fixed Effects			Random Effect		
	Coeff	t-stat	P-value	Coeff	t-stat	P-value
C	4.551	1.902	0.0618	10.937	5.236	0.0000
LBANKSIZE	4.011	20.227	0.0305	3.204	12.999	0.0000
LCASHOLD	0.572	2.214	0.0000	0.449	1.350	0.1817
LLADV	2.003	7.675	0.0000	1.999	5.846	0.0000
LSECINV	0.109	0.568	0.5707	0.598	2.551	0.0130
LTCA	0.658	2.253	0.0278	0.908	2.289	0.0252
LTFA	0.659	2.115	0.0384	0.671	1.554	0.1249
R^2	89%			68%		
F-Stat	44.50(0.00000)			19.99(0.00000)		
Haussmann Test	Chi-Sq. Statistic 28.797078		Chi-Sq. d.f. 7		Prob. 0.0002	

Authors' Fieldwork

The results of the fixed effect and random effect estimates are presented in Table 5 above. For the two panel frameworks, an appreciable degree of goodness of fit was documented with the fixed effect having a coefficient of determination of 89%, and the random effect was 68%. The overall significance of the panel regression was confirmed by the F-statistics that was statistically significant for both the fixed effect and the random effect. The choice of the preferred model was made using the Haussmann tests (χ^2=28.80; p-value= 0.0002), showing that the fixed effect model was the preferred and more efficient model.

All the asset structure variables were found to be positive and statistically significant influencers of financial performance. The exception was investment in securities, which was found to be statistically insignificant though the coefficient was positive at 10.9%.

Bank size and loans and advances represent the highest contributors towards the enhancement. It was found that financial performances improved by over 400%, and by 200% for every unit increase in bank size and loans and advances, respectively. This is owing to the fact that big sized banks and banks that have sufficient loanable funds to create loans and advances perform better financially than banks that are of a smaller size and lack fractional reserves for loans and advances.

Also, current assets and total fixed assets enhanced the financial performances of the investigated banks. The elasticity coefficient of financial performance to total fixed assets was 65.8%, while it was 65.9% for current assets. This shows that fixed assets and current assets enhance the profitable operations of banks, which ensures adequate liquidity to avoid runs, the forced sale of assets and technical insolvency.

The test for the cointegration between asset structures of the investigated banks was conducted using the Kao (1999) panel cointegration framework and the results are revealed in Table 6 below. The Kao framework enhanced the Pedroni test with an assumption of fixed slope parameters of all the cross sections, while the intercepts varied across the cross sections.

Table 6: Kao Residual Cointegration Test

Series: LROA LBANKSIZE LCASHOLD LLADV LSECINV LTCA LNCA

	t-Statistic	Prob.
ADF	-5.597	0.0000
Residual variance	0.608	
HAC variance	0.326	

Source: Authors' Fieldwork

A co-integrating relationship was inferred between the financial performance and asset structure of the studied banks. This implies that not only do the disaggregated components of asset structure influence financial performance, but the structure, in a collective and integrative manner, also drive the financial performance of banks in Nigeria.

CONCLUSION AND POLICY IMPLICATIONS

This paper examined the effects of asset structure on the performance of banks in Nigeria. The authors constructed a pooled data set, covering five leading banks with a national and international spread. First, the authors used a standard test to establish the adequacy of the panel data sets for the empirical estimation processes. Secondly, the authors deployed the fixed and random effect framework as the key estimation technique. Thirdly, after a proper post estimation test, the authors also confirmed the long run integrating relationship between asset structure and financial performance, consequent upon which appropriate inferences were made.

The results reveal that banks in Nigeria benefit from appropriate structuring of their earning and non-earning assets. This was evidenced by the positively significant relationship that asset structure shared with the financial performance of the investigated banks. This result supports the need for appropriate assets and liability management with the necessary reliance on profound theories such as the traditional portfolio theory, the trade-off theory and the pecking order theory. Evidently, this calls for the management of banks and regulatory agencies to set

structures that allow for proper bank asset composition. This is to ensure adequacy of earnings, liquidity and growth while guaranteeing the stability of Nigeria's banking system.

The results obtained in this study can aid the financial systems of banks in the broader African region, as well as in countries elsewhere. Essentially, it is imperative for managers of systems like those used in Nigeria to pay attention to asset structure for the imperatives of enhanced earnings, liquidity, stability, and the stemming of systemic distress.

REFERENCES

Adam, A. (2018). Handbook of asset and liability management: from models to optimal return strategies. New Jersey: John Wiley & Sons.

Adams, A. (2018). Handbook of asset and liability management: From models to optimal return strategies. The Wiley Finance Series. New Jersey: John Wiley and Sons

Akingunola, R. O., Olawale, L. S., & Olaniyan, J. D. (2017). Capital Structure Decision and Firm Performance: Evidence from Non-Financial Firms in Nigeria, Economica, 13(6), 351-364.

Al-ANI, M. K. (2013). Effects of assets structure on the financial performance: Evidence from sultanate of Oman. In 11th EBES Conference proceedings in Ekaterinburg, Russia (pp. 147-165).

Amadi, S. N. & Eyo, B. O. (2009). Asset structure and corporate profitability: A multivariate analysis. Journal of Investment and Management Studies, 1(1), 1-5.

Asteriou, D. and Hall, S. (2007) Applied Econometrics: A Modern Approach. New York: Palgrave Macmillan.

Brandt, M. W. (2010). Portfolio choice problems. In Handbook of financial econometrics: Tools and techniques (pp. 269-336). North-Holland.

Brooks, C. (2014) Introductory Econometrics for Finance. 3rd Edition. England: Cambridge University Press.

Choi, I. (2001/1999), "Unit root tests for panel data", Journal of International Money and Finance, Vol. 20 No. 2, pp. 249-272.

Danielsson, J., Jorgensen, B. N., De-Vries, C. G. and Yang, X. (2018). Optimal portfolio allocation under the probabilistic VaR constraint and incentives for financial innovation. Annals of Finance, 4(3): 345-367.

Darko, S. (2012). Constructing optimal stock portfolio with markowitz model (Doctoral dissertation).

Darrack Pariès, M., Halaj, G., & Kok, C. (2016). Bank capital structure and the credit channel of central bank asset purchases. Working Paper series, European Central Bank

Ekpo, N. B. (2015). Financial management practices and growth performance of micro, small and medium enterprises in AkwaIbom State, Nigeria. Unpublished Ph. D Thesis, University of Uyo, Nigeria.

Ekpo, N. B., & Mbobo, M. E. (2016). Asset structure and profitability of microfinance banks: Evidence from AkwaIbom State, Nigeria. International Journal of Finance and Management in practice, 4(1), 47-58.

El-Chaarani, H. & El-Abiad, z. (2019). Analysis of capital structure and performance of banking sector in Middle East countries. International Journal of Economics and Financial Issues, 9(2), 1-11

Gamayuni, R. R. (2015). The effect of intangible asset, financial performance and financial policies on the firm value. International Journal of Scientific and Technology Research, 4(1):202-212.

Gladys M. and Job O. (2017). Asset Structure and Financial Performance: A Case of Firms. Research Journal of Finance and Accounting, Kenya. 8(4), 192-200

Green, C. J., Murinde, V., & Suppakitjarak, J. (2002). Corporate financial structures in India.

Hałaj, G. (2013). Optimal asset structure of a bank-bank reactions to stressful market conditions (No. 1533). ECB Working Paper.

Hamilton, L. C., & Asundi, R. (2008). Technology usage and innovation: Its effect on the profitability of SMEs. Management Research News.

Hanran, L. & Wenshu, W. (2014). Impact of intangible assets on profitability of hong Kong listed information technology companies: macro think institute: Hong Kong.

Hataj, G. (2018). Optimal asset structure of a bank, bank reactions to stressful market conditions. European Central Bank, Working Paper Series No. 1533.

Hossain, A., Khan, A. A., & Khalid, M. S. (2019). An empirical analysis of capital structure and firm's financial performance in a developing country. Global Journal of Management and Business Research, 19(3), 8-16

Im Kyung So; Pesaran Mohammad and Shin Yongcheol, (2003), Testing for unit roots in heterogeneous panels, Journal of Econometrics, 115, (1), 53-74

Koralun-Bereźnicka, J. (2013). How does asset structure correlate with capital structure? cross-industry and cross-size analysis of the EU countries. Universal Journal of Accounting and Finance, 1(1).

Kusy, M. I. & Ziemba, W. T. (1986). A bank asset and liability management model. Operations Research, 34, 3.

Kusy, M. I., & Ziemba, W. T. (1986). A bank asset and liability management model. Operations research, 34(3), 356-376.

Lee T. P. &, Phan, T.B. (2017). Capital structure and firm performance: empirical evidence from a small transition country. Res Int Bus Finance, 42, 710–726.

Levin, A., Lin, C.F. and Chu, C. (2002), "Unit root test in panel data: asymptotic and finite sample properties", Journal of Econometrics, Vol. 108 No. 1, pp. 1-25

Lončar, I., & Svilokos, T. (2021). Nexus between assets structure and profitability of Croatian banking system. International Journal of Economics and Business Research, 21(1), 107-125.

Maddala, G.S. and Wu, S. (1999), "A comparative study of unit root tests with panel data and a new simple test", Oxford Bulletin of Economics and Statistics, Vol. 61, pp. 631-652.

Markowitz, H. (1952). Portfolio selection. Journal of Finance, 7, 17-99.

Molyneux, P., & Thornton, J. (1992). Determinants of European bank profitability: A note. Journal of Banking & Finance, 16(6),1173-1178. https://doi.org/10.1016/0378-4266(92)90065-8

Muchiri, M. J., Muturi, W. M. & Ngumi, P. M. (2016). Relationship between financial structure and financial performance of firms listed at east Africa securities exchanges. Journal of Emerging Issues in Economics, Finance and Banking (JEIEFB), 5(1), 1734- 1755.

Mwaniki, G & Omagwa, J (2017). Asset structure and financial performance: a case of firms quoted under commercial and services sector at the Nairobi securities exchange, Kenya. Research Journal of Finance and Accounting, 8(4), 102-110.

Paramasivan, C. & Subramanian, T. (2009). Financial management. New Delhi: New Age International Pvt. Ltd

Peñaranda, F. (2007). Portfolio choice beyond the traditional approach. Available at SSRN 1003123.

Petria, N., Capraru, B., & Ihnatov, I. (2015). Determinants of banks profitability: evidence from EU 27 banking system, Procedia Economics and Finance, 20, 518-524. https://doi.org/10.1016/S2212-5671(15)00104-5

Santoso, A., & Ariefiantoro, T. (2019). Managerial ownership as moderating variables in effect of profitability on firm value. TirtayasaEkonomika, 14(2), 220-231.

Sathyamoorthi, C.R., & Dzimiri, M. (2020). Liquidity Management and Financial Performance: Evidence from Commercial Banks in Botswana. International Journal of Financial Research 11(5): 399-413.

Scherer, B. (2007). Can robust portfolio optimization help to build better portfolios? Journal of Asset Management, 7(6), 374-387.

Schmidt, T. S. (2014). Low-carbon investment risks and de-risking. Nature Climate Change, 4(4), 237-239.

Setiadharma S, Machali M (2017) The effect of asset structure and firm size on firm value with capital structure as intervening variable. Journal of Business and Financial Affairs, 6 (4), 298-302.

Simon, T. (2010). An empirical study of stock portfolios based on diversification and innovative measures of risks. Master Thesis-Final Report.

Stoughton, N. M. & Zechhner, J. (2017). Optimal capital allocation using RAROC(TM) and EVA(R). Journal of Financial Intermediation, 16(3), 312-342.

Syamsuddin, L. (2007). Corporate financial management: Concepts application in: planning, monitoring and decision making. Jakarta: PT. King GrafindoPersada.

Terefe, E. (2019). The Impact of Asset Structure on Financial Performance of Private Commercial Banks in Ethiopia (Doctoral dissertation, St. Mary's University).

Thakor, A. V., Mehran, H. & Acharya, V. (2010). Regulating bank leverage when there is rent seeking and risk shifting. Federal Reserve Bank, New York, Working Paper Series No. 643, 1-46 Retrieved April 5th, 2019 at: https://www.newyorkfed.org>research

Tiendem, N. (2020). Supply chain quality management (SCQM); A tool for financial performance of brewery companies in the south west region of cameroon. International Journal of Business and Economics Research, 9(5), 298.

Ukhriyawati, C. F., Ratnawati, T., &Riyadi, F. (2017). The influence of asset structure, capital structure, risk management and good corporate governance on financial performance. International Journal of Business and Management, 12(8),249-260.

Umobong, A. A., & Agburuga, U. T. (2019). The Nexus of asset composition with accounting and market performance of firms in Nigeria. Nexus, 10(22).

Xu, Z. S., & Xu, N. Z. (2013). The research of the optimal allocation of assets structure and business performance. Research Journal of Economics, Business and ICT, 8(1).

Yahaya, O. A., & Andow, H. A. (2015). Capital structure and firm's financial performance: Panel evidence of listed conglomerate firms in Nigeria. Kaduna Business Management Review, 2(1), 45-56.

Zhang, C., & Dong, L. (2011). Determinants of bank profitability: Evidence from the U.S. Banking Sector (Research project, FRM Project-Simon Fraser University). Vancouver, CA: Segal Graduate School of Business. Retrieved from http://summit.sfu.ca/item/13065