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Assessing the Effectiveness of Simulation Techniques on Loan Facilities and the Profitability of Deposit Money Banks in Nigeria: A Case Study of Access Bank PLC, 2015-2024

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ABSTRACT

The study tittle is assessing the effectiveness of simulation techniques on loan facilities and the performance of deposit money banks in Nigeria. (Access bank plc. 2015-2024). However, the specific objectives were to: examine the effect of loan to deposit ratio (LDR) on the profitability, examine the effect of non-performing loans (NPL) on the profitability of Access Bank Plc in Nigeria. Thus; simple linear regression was adopted to analyze hypothesis. However, the result of SPSS data analysis reveals that R valued 0.242 and therefore, loan to deposit ratio has a significant effect on the bank's profitability. On the same vain, R valued 0.279 over the result of whether non-performing loans have a significant effect on the bank's profitability or not, the value of R which was 0.279 shows that it has. More so, the bank is generally advised to monitor macroeconomic factors and adjust their lending strategies accordingly in order to mitigate the impact of external factors on their profitability.

Keywords: Effectiveness, Techniques, Loan, Banks, Performance

INTRODUCTION

Assessing the effectiveness of simulation techniques on loan facilities and the performance of deposit money banks in Nigeria has been a topic of interest to the researchers as credit risk mismanagement can result to banks' exposure to unhealthy liquidity, inability to meet up with customers' demands, CBN's regulatory requirements default and discouragement of shareholders or investors, thus; resulting to the bank's acquisition by other healthy bank, or amalgamating with other bank(s). However, this topic has been channeled to focus on Access Bank Plc in Nigeria as a case study for Deposit Money Banks in Nigeria. Now, the primary objective of any investor in any business organization is to maximize returns on their investment (Abdullah et al. 2015). Return maximization on investment provides sufficient prove or evidence to both the existing and prospecting investors in firm business assets to decide on whether to invest in a new business, adjust or maintain their stance or even withdraw completely (Abiodun & Mlanga, 2019). They are driven by the firm's ability to maximize profit within a stipulated time frame. It is an important tool for investment decisions therefore firms place it at the top list of their priority. Even though there are other activities which are of great concern to their growth and survival they are directly or indirectly related to maximizing returns on shareholders' investment (Adegbie & Dare, 2020). Although, many researchers have a broader perspective on business performance. They look at performance from any activity that would have a contribution to the success, growth and development of the business and by extension, to the economy (Adesina et al.2015, Ajayi & Ajayi, 2017 Ajayi et al.2019). Business success is dependent to the degree to which an organization utilizes its human and material resources to achieve its main objective or goal. Achievement of its main goal is not possible in isolation of engaging human and material resources. On the other hand, the external environment contributes to a certain degree towards business success. Both internal and external factors are crucial to global business performance, even though the factors vary from industry to industry within the same country but are essential to its growth and success which could be assessed in terms of financial performance (Alade, 2014). A Firm's financial performance depends on its ability to satisfy its demand and contribute to shareholders' return on investment (Alade, 2014). It is worthy of notice, therefore, that firms incorporate all parties involved to words profit maximization. Given the stakeholder theory, business stakeholders who are treated well tend to reciprocate with positive attitudes and behaviors towards the fulfilment of the organization's goals (Parmar et al.2010). Firm performance should reflect the efficient management of all stakeholders to give their maximum support to actualize the organization's objectives (Ahmad and Tahir, 2019).

The financial performance and long-term survival of deposit money banks (DMBs) are challenged by financial risk and corporate governance lapses in Nigeria (CBN Report, 2018, Premium Time, 2018 Vanguard, 2021). The Central Bank of Nigeria (CBN) in consultation with Nigerian Deposit Insurance Corporation (NDIC) withdrew the operating licence of Sky Bank. The CBN however, discovered some unacceptable corporate governance lapses and persistent failure of the bank to meet with minimum capital adequacy threshold which made the bank appear frequently at the CBN lending window. The report revealed that after a careful examination and forensic audit of Sky Bank, an urgent recapitalization was required as the bank could no longer continue to live on borrowed time due to poor performance (CBN report, 2018).

The recent quarterly report of First Bank Limited at the end of 31st March 2021 revealed that bad loans are a major challenge facing first-generation banks. The report, however, showed that impairment charges increased, depressing the group's core banking net income by 21.6% to ₦39.6billion in the first quarter, of 2021 as against ₦50.5 billion recorded in the comparable period of 2020 (Vanguard,2021). Furthermore, the report showed a double-digit decline across the key performance indicators. All these were attributed to drag on nonperforming loans among others. The effect on performance, however, can be seen on the financial statement of FBN revealed end of 31st March 2021. The gross earnings of the bank dropped from ₦159.68 billion in the first quarter of 2020 to ₦136.58 billion in in first quarter of 2021. The profit after tax had declined from ₦28.68 billion to ₦18.91 billion of the same period. The net profit also moderated from ₦25.70billion to ₦15.6 billion in the aforesaid period.

As earlier mentioned, profit-oriented businesses are majorly concerned about maximizing return on shareholder's investment, but their activities vary from one industry to another. For example, DMB operations are quite different from insurance firms, even though they are within the same sector and aimed at profitability. Furthermore, DMBs uniqueness which characterized by deposit mobilization and giving out loans and advances to individuals, investors, and government to finance consumption, investment and expenditure thereby maximizing profit in the form of interest income and contributing to economic growth and development of a nation. To perform this function, DMBs require a strong capital base. The central bank is saddled with the responsibility of coming up with policies related to DMB's operation (Argaw, 2016). For example, CBN, set policies on non-performing loans, capital adequacy ratio, and liquidity ratio and caution DMBs on loan loss provision. They all threaten the success or in extreme cases determine the failure of the industry. In regards to the above presentation, this study is however, designed to assess the effectiveness of simulation techniques on loan facilities and the performance of deposit money banks in Nigeria using Access bank plc as the case study which covers the period of (2015-2024).

Loan is a major source of banks' profitability but over the decades, banks have been faced with serious difficulty in recovering most of the loans and other credit facilities granted, thereby, threatening their capital adequacy ratio, liquidity ratio, profitability and tend to create higher rate of bad debt which exposes the bank to abrupt liquidation as the bank is unable to meet up with the CBN's statutory requirements. Hence, the need to mitigate the consequences posed via simulation techniques through which credit applications by customers are thoroughly examined to ascertain the customer's credit worthiness and repayment probability before such facility is given consideration. Therefore, the need for this research work which has been aimed at assessing the effectiveness of simulation techniques on loan facilities and the profitability of deposit money banks in Nigeria, under which the effect of Loan to deposit ratio (LDR), Non-Performing Loans (NPL) were the variables assessed in determining the profitability level of Access Bank Plc in Nigeria.

Research Questions

The following questions were pertinent to provide answers for in the course of this research work which are stated as follows

i. Does the loan to deposit ratio (LDR) affect the profitability of Access Bank Plc in Nigeria?
ii. Does the non-performing loans (NPL) affect the profitability of Access Bank Plc in Nigeria?

Objectives of the Study

The study's general objective is to assess the effectiveness of simulation techniques on loan facilities and the performance of deposit money banks in Nigeria via the following specific objectives which are to:

i. Examine the effect of loan to deposit ratio (LDR) on the profitability of Access Bank Plc in Nigeria.
ii. Examine the effect of non-performing loans (NPL) on the profitability of Access Bank Plc in Nigeria.

Research Hypothesis

The researchers have adopted null hypothesis to evaluate the variables of this study and they go thus;

i. Loan to deposit ratio (LDR) does not affect the profitability of Access Bank Plc in Nigeria?
ii. Non-performing loans (NPL) does affect the profitability of Access Bank Plc in Nigeria?

LITERATURE REVIEW

Conceptual Review

Credit risk assessment: it is the evaluation of likelihood that a bank's customer or borrower will not or be able to repay a loan that has been granted to him due to certain factors like business downturn amongst many other. This however, is basically done with a formula which incorporate some key components such as probability of default (PD), exposure at default (EAD) and loss given default (LGD). However, the formula is stated as thus; Expected Loss (EL) = PD X LGD X EAD.

Simulation techniques can significantly improve loan management in Nigeria deposit money banks as it helps to model and predict the performance of loan, assess its repayment risk as well as optimizing portfolio management of the banks. These techniques such as Monte Carlo simulation and goal programming can assist banks in analyzing various scenarios, including economic downturns and changes in borrowers' behavior in order to make more informed lending decisions and manage potential losses.

Loan to Deposit Ratio: a higher deposit ratio can positively influence the available amount of capital that would be out to customers as loanable funds. This means that when the bank has enough depositors fund with it, a reasonable percentage of it is loanable to preferred sectors which in turns, generate additional liquidity to the bank via the interest paid on such loans or credit facility and serve as a buffer against potential liquidation of the bank since it will be able to meet up with the CBN's regulatory policy of reserve requirement.

Non-performing loan: higher defaults in loan repayment by the borrowers can negatively affect the banks performance. This is because, it decreases interest income and as such, necessitating for loan losses, inability of the bank to meet with customers satisfaction and shareholders expectation, as well as not being able to meet up with the reserve requirement of the CBN. Therefore, it is pertinent for any bank to critically analyze the credit worthiness of any given customer intending to take loan from the bank before such loan is granted. This is where the 5 Cs of lending come to work whereby the character of the customer is expected to be verified via his past credit records of prompt payment, the capital he seek, how much and how proportionally appropriate with the purpose for which he is seeking the loan for? as well as considering is the amount does not ultra vires the credit ceiling for a particular individual or corporate body. More also, the Capacity of the customer to enter into a contractual relationship and his ability to repay as and when due under the terms of the loan. Condition is the documentation of the contract deal of the loan i.e Terms and Conditions which must be documented. However, Collateral is one crucial step a bank should get hold of, that is, the property which has higher value is expected to secure the loan against potential default. Therefore, the document of such property and it verification for authenticity should be in the possession of the bank before the customer's loan or credit request is granted.

In Nigeria, NPL is categorized as standard, doubtful, very doubtful and loss (Oyelade, 2019). This comprises substandard, doubtful, and virtual loss and loss, and is categorized in respect of their degree of collection difficulty. However, once the borrower starts making payment again on a non-performing loan, it is now termed as a re-performing loan, even though the borrower has not repaid all the unpaid amount, the study added.

Capital Adequacy Ratio (CAR): this is a measure of bank's financial strength which specifically determines how much capital the bank has available compare to its risk-weighted assets. This is a key indicator of hoe bank is able to absorb potential losses and still meet with its financial obligations in situations where the borrowers have failed to honor the loan terms by repaying their money in due times. Therefore, financial regulators use CAR to ensure that banks are able to maintain sufficient capital to prevent liquidation and protect depositors from losing their savings with the banks. Therefore, capital adequacy serves as a buffer against potential shock and or loss which could impact the banks financial health.

Importance of Risk Assessment

Risk assessment is a very crucial measure to identify potential hazards, evaluate their likely occurrence and implication, thereby, implementing measures to curtail or mitigate or eliminate the potential severity it can render by protecting the customers and their properties or resources ultimately. It is a proactive approach to help in preventing accidents, ensure safety as well as legal requirement compliance. It enhances organizational resilience, improve informed decision making and helps to avoid legal penalties from the regulatory bodies.

Theoretical Review

1. Credit Risk Theory: it sheds light on the risk associated with banks' lending business. The banking business is characterized by giving out credits to individuals, investors and accepting deposit from the public. This process, however, exposes the industry to credit risk as there is tendency for defaults from customer as they may not repay the loan as and when due. The DMBs therefore, has to exercise due diligence in performing their function in order to reduce credit risk (Anderson et al., 2012). Failure to do so results to a non-performing loan, loan loss provision, which reduces the tendency or efficacy to extend loans and advance further, consequently affecting interest income and financial performance (Owojori, et al., 2011).

2. Financial Distress Theory: this theory examines the relationship between credit risk and borrowers financial health, suggesting that firms experiencing financial distress are more likely to default on their financial obligations.

3. Prospect Theory: this states that individuals make decisions based on how they perceive potential gains and losses reference point, rather than solely on final wealth, which can influence how borrowers and lenders assess risk.

4. Agency Theory: this is the type of theory explores the relationship between borrowers and lenders, which highlights potential conflicts of interest where borrowers may prioritize their own interests. (e.g., taking on excessive risk) over the lender's potentially increasing credit risk.

5. Credit Risk Modeling: these are various statistical and econometric models used to quantify and predict credit risk, they help lenders assess the probability of defaults and the potential losses associated with different loans or portfolios, according to Bryn Mawr Tripod.

6. Portfolio Theory: suggests the diversification of credit exposure across different borrowers, industries and or geographic locations which tends to reduce overall portfolio risk. This is a pertinent theory as it emphasized on banks not focusing or channeling its loanable funds on a particular sector but rather, spread its risk across different sectors and zones in order to absorb any default risk or failure that could emanate from a particular sector.

Empirical Review

Banks'capital can be viewed from two different angles. It could be seen from the initial amount provided by the ordinary shareholders (paid-up capital), which in return, they were given the right to enjoy the future earnings of the business. By extension, this definition includes proceeds from premiums arising from the selling of shares, all forms of the reserve, undistributed profits, and income accrued to minority shareholders subsidiaries, and associates, excluding preference shares holders and revaluation reserve (Osuagwu, 2014) Annor and Obeng (2018), Udom and Eze (2018), Hilit et al. (2019), Muhammad et al. (2019) Sunaryo (2020), and Keqa (2021) concluded their studies on capital adequacy ratio and financial performance, strong capital proxy(capital adequacy ratio) have a positive greater effect on financial performance proxy(Return on asset). Similar studies by Puspitiasari (2021), Echobel and Okika (2019) and Asari and Endri (2019) however concluded that the capital adequacy ratio does not affect financial performance.

A loan loss provision LLP is regarded as an amount set aside to recover principal and interest which ordinarily ought to have been recovered from customers (Mamun, 2004). The loan is classified as NPL when both principal and interest are due for over three months, automatically calling for LLP to be set at 20%, the study further explained. In many studies reviewed, managers exercise their discretion in coming up with LLP which gives paves way for earning management (Abdullah et al. 2017, Wood & Skinners, 2018 Zheng et al. 2019). Notwithstanding, the described LLP is the amount unanimously set aside by the management team to serves as a cushion or a buffer in the event of loan repayment default. Egziabhere (2015) and Ahmad and Tahir (2019) reported a positive effect of loan loss provision on financial performance. On the other extreme, Teshome et al. (2018) and Alhadab and Alsahawneh. (2016) concluded loan loss provision has negative effects on financial performance.

Methodology

Research Design: The research is aimed at examining the effectiveness of simulation techniques on loan facilities and the profitability of deposit money banks (DMBs) in Nigeria where Access Bank Plc was made the focus within the year (2015-2024), under which some variables were studied as proxies of simulation techniques. These include understanding the effect of loan to deposit ratio (LDR) on profitability, non-performing loans (NPL) on profitability of Access Bank Plc in Nigeria.

Method of Data Collection: the data used to analyze the variables were secondary and were basically fetched from the Access Bank Annual financial report and some information too were derived from the CBN statistical Bulletin to aid and ease the process.

Method of Data Analysis: the variables under study were analyzed through simple linear regression (SLR) with SPSS software.

Model Specification: The study adapted the empirical work of (Dr. Maimuna Y. M and Dr. Anthonia N. N. 2023) in order to specify the functional form of the model. Thus; the functional form of the model is however, modified to suit this research work as specified below:

PAT = f (LDR, NPL, CAR) ………………………………..……… (1)

Linear form of the model is presented below;

$NPLt = \beta o\ LDRt + \beta 1PATt + \beta 2CARt + \mu t$ …………….……(2)

Where;
PAT= Profit after Tax
LDR= Loan to Deposit Ratio
NPL= Non-Performing Loan
f = Functional relationship
βo= benchmark
CAR= Capital Adequacy Ratio.

RESULTS AND DISCUSSION

Table 1: Simple Linear Regression

HYP 1: Loan to deposit ratio (LDR) does not have effect on the profitability of Assess Bank Plc in Nigeria.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.242[a]	.059	-.059	263.44733	.454

a. Predictors: (Constant), Loan to Deposit Ratio
b. Dependent Variable: Profit After Tax

On the above table1 R is the correlation coefficient measuring the strength of the linear relationship between the variables under consideration, the result of SPSS data analysis reveals that R valued 0.242. The R value can be said to be positively significant. The Durbin-Watson value of 0.454 which confirms that the estimate is positive but the degree of responsiveness is low since it falls short in meeting the Dubin Watson criteria of 1.700 and also the standard error of estimate of 263.447, therefore, we accept the alternative hypothesis which says that, loan to deposit ratio (LDR) has a positive impact on the profitability of Access bank plc while we reject the null hypothesis that says it does not. This means that where there is a reasonable amount of fund deposited by the bank’s customers that tends to contribute positively on its profitability. That is to say, higher deposits from customers results to a relatively higher loan granting, but not without thorough risk assessment which has given a high rate of confidence in the recovery and thus; a very insignificant default rate.

Table 2
Hyp 1

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	34563.830	1	34563.830	.498	.500[b]
	Residual	555235.962	8	69404.495		
	Total	589799.792	9			

a. Dependent Variable: Profit After Tax
b. Predictors: (Constant), Loan to Deposit Ratio

Table of ANOVA indicate the significant value of 0.498 which means the significant value is moderately significant. More so, the F-statistics also shows a positive value of 0.498, the significant value is close to zero and highly existent. This is so because, the bank does not solely rely on deposit ratio to determine its loan granting potential as there are many income sources being utilized to maximize its revenue via the adoption of computer based models to analyzing real world scenarios in order to determine most effective strategic decisions in risk assessment and various revenue mobilization avenues.

Table 3
Hyp 1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	288.542	98.755		2.922	.019
	Loan to Deposit Ratio	-.338	.478	-.242	-.706	.500

a. Dependent Variable: Profit After Tax

The t-test affirms the tendency of possible relationship between the variables of LDR and Profitability by displaying positive t-test. T-test (coefficients) of the model which indicates that the model has closeness of fit which means that the model is positively significant at 5% level of significance, the test value of 2.922 shows the data set follow a normal distribution and also have an unknown variance. More so, t-test which determines whether there is a significant difference between the means of the two variables which indicates significant differences, we therefore assume that the dependent variable fits normal distribution.

The significant value of 0.500 estimated that the parameter is high. It suggests strong evidence against the null hypothesis and in favour of the alternative hypothesis at 5% level of significance; hence the autocorrelation between LDR and profitability of Access bank plc. We therefore, reject the null hypothesis which says otherwise.

HYP 2 SIMPLE LINEAR REGRESSON TECHNIQUE

Table 4: Non-performing loans (NPL) does affect the profitability of Access Bank Plc in Nigeria.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.279[a]	.078	-.037	260.73910

a. Predictors: (Constant), Non Performing Loan

On the above table1 R is the correlation coefficient measuring the strength of the linear relationship between the variables under consideration, the result of SPSS data analysis reveals that R valued 0.279. The R value can be said to be weak but positively significant. Therefore, we accept the alternative hypothesis which says that, Non-performing loan (NPL) has a significant effect on the profitability of Access bank plc while we reject the null hypothesis that says otherwise. This means that, the higher the level of non-performing loans, the lower the profitability of the bank.

Table 5: Non-performing loans (NPL) does not affect the profitability of Access Bank Plc in Nigeria

Hyp 2

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	45920.782	1	45920.782	.675	.435[b]
	Residual	543879.009	8	67984.876		
	Total	589799.792	9			

a. Dependent Variable: Profit After Tax

b. Predictors: (Constant), Non-Performing Loan

Table of ANOVA indicate the significant value of 0.435 which means the significant value is moderately significant. More so, the F-statistics also shows a positive value of 0.675, the significant value is close to zero and highly existent.

Table 6: Non-performing loans (NPL) does affect the profitability of Access Bank Plc in Nigeria.

Hyp 2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	436.386	240.029		1.818	.107
	Non Performing Loan	-54.554	66.379	-.279	-.822	.435

a. Dependent Variable: Profit After Tax

From the table 6 above, t-test affirms the tendency of possible relationship between the variables of NPL and Profitability by displaying positive t-test, but negatively affects the bank's profitability. T-test (coefficients) of the model which indicates that the model has closeness of fit which means that the model is positively significant at 5% level of significance, the test value of 1.818 shows the data set follow a normal distribution and also have an unknown variance. More so, t-test which determines whether there is a significant difference between the means of the two variables which indicates a relatively poor difference, we however, assume still, that the dependent variable fits normal distribution, while we still accept the alternative hypothesis which stated that, Non-performing loan (NPL) has a significant effect on the profitability of Access bank plc while we reject the null hypothesis that says otherwise.

Summary

The study is to assess the effectiveness of simulation techniques on loan facilities and the profitability of deposit money banks in Nigeria, where Access bank plc has been made a case study with a scope of (2015-2024), under which the effect of Loan to deposit ratio (LDR), Non-Performing Loans (NPL) were the variables assessed in determining the profitability level of Access Bank Plc in

Nigeria. However, the result of the study revealed that loan to deposit ratio and non-performing loans have effect on the banks profitability respectively, but then, the effect is mitigated as the bank have adopted computer based models of real world banking systems and scenarios to analyze the likely attributed risk in their loan granting, optimize its processes and come up with informed strategic decisions without real world consequences as well as they do not really solely on customers deposit to in turn, granting loans but harnessing and utilizing various business opportunities with high returns which leads to their capital adequacy. However, the bank is generally advised to monitor macroeconomic factors and adjust their lending strategies accordingly in order to mitigate the impact of external factors on their profitability.

CONCLUSION

Sequel to the findings, it can be deduced that Loan to deposit ratio and Non-performing loans have a relatively significant effect on Access bank's profitability respectively during the period understudy.

RECOMMENDATIONS

i. Access bank plc should explore non-interest income source, like fees and commissions in order to reduce their reliance on interest income like loans.
ii. The bank should further strengthen their credit risk management processes with thorough analysis, loan monitoring and recovery procedures in order to minimize the risk of NPLs.
iii. The bank should optimize their assets and liabilities to ensure sufficient liquidity availability to meet up with their financial obligations.
iv. The bank should also ensure that regular training is conducted for credit officers on risk appraisal.
v. The bank is also advised to monitor macroeconomic factors and adjust their lending strategies accordingly in order to mitigate the impact of external factors on their profitability.
vi. Strict adherence to the regulatory policies is paramount and the bank should understand that it will need to maintain a higher capital adequacy ratio where it has a higher loan to deposit ratio.
    This will enable it to cushion the effect of the loan recovery risk and meet with the policies of the financial regulatory bodies.

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