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BASEL ACCORD III AS A REGULATORY FRAMEWORK FOR BANKS' RISK MANAGEMENT: ITS INFLUENCE ON OPERATIONAL EFFICIENCY OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

Despite the numerous regulatory frameworks employed by the different financial regulators in various economies, the 2009 financial crisis that crumbled the world's financial system could not be avoided. The Basel III framework became fully implemented by firms in the financial sector and the introduction of expected shortfalls served as substitute for Value at Risk. However, despite these various regulatory frameworks, operational activities kept fluctuating in the Nigerian economy. Thus, this study examined the effect of the implementation of Basel Accord III on the operational efficiency of listed banks in Nigeria. Data such as expected shortfalls, credit risk, market risk, and liquidity risk were collected from individual selected banks and were analyzed using the fixed effect regression model. The result showed that expected shortfalls affects operational efficiency negatively (-0145). The findings also revealed that credit risk (0.099) and liquidity risk (0.00008) positively influence operational efficiency in Nigeria. It was concluded that the implementation of Basel III framework in Nigeria negatively influences operational efficiency. Thus, there is a need for banks to embrace the effective use of expected shortfalls in order to minimize bank risk, especially in the capital market.

Keywords: Operational efficiency, expected shortfalls, Basel framework

1.0 INTRODUCTION

The Nigerian banking system has been the backbone of the financial system in the Nigerian economy. The financial system, like in every other economy, exceeds the function of facilitating payment and credits. Sanusi (2012) asserted that the financial system serves as the central nervous system with different components. These components include the financial intermediaries, financial markets, and the infrastructural constituent. The sound financial health status of the banking sector of an economy gives the guarantee of safety of depositors' valuables and also important for shareholders, depositors, regulators, bank employees and other stakeholders alike. An adverse banking situation will trigger concerns as to the ability of a bank to meet up with continuing being a going concern and meeting up its statutory obligations. A healthy banking system and a booming economy are closely related and inseparable. However, for the banking system to optimally function and instill public confidence, it is important that there is the achievement of some level of stability which can be established through operational efficiency. Sanusi (2012) also asserted that countries must regularly issue reforms for the banking system, especially after the global financial crisis. Thus, in order to investigate the soundness of the banking system, the Basel

framework was introduced as a yardstick that provides a set of standards for bank supervision, operational requirement and regulation across the globe.

The financial system of every economy serves as the bedrock on which every form of investment and economic development is laid. Specifically, Guru and Yadav (2018) stated that the development of an economy calls for a commensurate development of the financial sector. Olaniyan et al. (2022) added that the functions of the financial system of countries go beyond facilitating domestic savings and investment that spurs economic development. The functions also include international remittances as a result of investors parting away with some parts of their human capital for future benefits (Blouchoutzi & Nikas, 2014). In addition to the function of the financial system is ensuring that every sector of the economy is financially included, a policy that has been confirmed to be a global agenda since the new millennium (Ratnawati, 2020). The composition of the financial system principally includes the financial intermediaries in the form of banks.

However, according to Agbaeze and Onwuka (2014), Toby and Danjuma (2021), and Oyetade et al. (2020), the financial institutions have gone through several distresses that have made people to lose confidence in the performance of these financial institutions. Aside from the bank distresses, economic recession has also been termed as one of the critical strongholds against the performance of financial institutions (Agbaeze & Onwuka, 2014). Due to the numerous challenges witnessed by financial institutions all over the world and the effect of economic recession on these financial institutions, there seem to be a regulatory framework that was introduced with the aim of regulating the activities of these banks in order to meet the activities of the economy. Specifically, due to the debt crisis that hit America in the 1980s that led to the questioning of the capital ratios of foreign banks (Feridun & Ozun, 2020), the Basel Capital Accords was introduced, and the policy was supported by the G10 countries. Toby and Danjuma (2021) further stressed the importance of liquidity management as a critical factor that influences the capital adequacy of banks in every economy, and Nigeria particularly. The importance of liquidity management is seen especially during the period of financial distress as observed some decades ago. These factors further stress the need for a universal regulatory body that would be in charge of providing a general yardstick through which the operational efficiency of financial institutions may be evaluated.

Due to the globalization experienced in the financial industry in the world, many countries, whether developed or developing are constantly reviewing their financial reforms in conformity with the Basel III in order to meet global financial challenges (Zhou et al., 2019). Thus, banks are aimed at optimizing their efficiencies in order to operate optimally and meet global standards. Zhou et al. (2019) expressed that the operational efficiencies in the banking system are in terms of their productivity and profitability. Capital allocation is the first step toward operational efficiency and profitability. Profitability follows capital allocation. Total loans are capital allocation outputs and profitability inputs, while deposits are capital organization outputs and capital allocation inputs (Zhou et al., 2019). Despite the numerous financial reforms, especially in a developing economy like Nigeria, bank risk has continued to increase (Udoka & Orok, 2017). Partovi and Matousek (2019) also noted that in some developed economies, despite the regulatory reforms, the percentage of non-performing loans has not reduced partly due to high-risk appetite.

There are a number of studies that have examined bank regulations in Nigeria and EU but there are sufficiently few studies that have considered the connection between these reforms and regulations, especially linked with the Basel framework, and banks' operational efficiency. Studies like Toby and Danjuma (2021), Udoka and Orok

(2017), Godswill et al. (2018), and Oyetade et al. (2020) looked at various banking reforms in Nigeria but linked them to the profitability of these banks. Furthermore, in the developed countries, Feridun and Ozun (2020), Partovi and Matousek (2019), Akbay (2021), and Karamoy and Tulung (2019) have explored different banking reforms but have not connected them to the operational efficiencies of these banks. Using a temporal scope of the Nigerian economy and between 2010 and 2022, the study outlined the following four research objectives;

i. Ascertain how expected shortfalls affect operational efficiency of listed deposit money banks in Nigeria;
ii. Investigate the influence of credit risk on the operational efficiency of listed deposit money banks in Nigeria;
iii. Examine the influence of market risk on the operational efficiency of listed deposit money banks in Nigeria; and
iv. Assess the impact of liquidity risk on the operational efficiency of listed deposit money banks in Nigeria.

2.0 LITERATURE REVIEW

Bank Regulation

Swamy (2011) explained that bank regulations are aimed at ensuring that the financial system is sound and safe and to guide against bank crisis and failure. The major objective of bank regulation is to protect depositors' interest and promote a health investment environment guided by the financial institutions. However, there are several opinions on the need and extent to which banks should be regularized. Adams (2005) noted that government had no business in business and as such, should refrain from economic and financial activities. However, Short and O'Driscoll (1983) opined that it is necessary for government to regulate the activities of banks in every economy in order to protect depositors. Swamy (2011) claimed that the primary justification for bank regulation is the frequent market or bank failures brought on by externalities, market power, and knowledge asymmetry between buyers and sellers in the market. The need to restrain banks' profit-seeking behavior in an uncertain decision-making environment (Minsky, 1975), the issue of ownership structure and management behavior (Jensen & Meckling, 1976), the objectionable risk-taking behavior of banks, and potential conflicts of interest that may arise when banks diversify their activities (Saunders, 1985), and these are additional noteworthy theoretical justifications for banking regulation that have been demonstrated by prior studies.

The Basel Framework

The Basel framework refers to a set of standards of the Basel Committee on Banking Supervision (BCBS), aimed at ensuring primary and internationally recognized standard for the regulation of banks (Bank for International Settlements, 2019). The Basel framework is applied to a collection of internationally recognized and active banks with a scope of a fully consolidated banking group and, with the aim of ensuring the capital basis of these banks is adequate.

Basel Accord I

Makwiramiti (2008) explained that the major focus of the Basel I is on credit risk. The framework became the international standard to be used when banks are measuring various credit risks exposures, especially, internationally licensed banks (Klaus, 2001; Stewart, 2021). There are a number of countries that embraced the Basel I framework when it was introduced by the Bank for International Settlement, including Nigeria. Cumming and Nel (2005) added that the international banking system was hugely strengthened due to the implementation of the framework because it became the standard through which the capital requirements of these banks are measured. As a

result, Dobson and Hufbauer (2001) implied that the implementation of the Basel I by banks in different countries led to a drastic reduction in the systematic risk and nature of bank failures.

Basel Accord II

The BASEL II came into limelight in 2004 with some significantly different introduction to capital requirements. Swamy (2011) asserted that because Basel II was coined out of the Basel I, it is not a revolution for banks. However, the Chartered Institute of Bankers of Nigeria (CIBN) (2013) stated that the Basel II framework serves as a set of regulations aimed at bank supervision and tailoured towards the halting of capital erosion by banks in the financial system. In his own explanation, Obinna (2013) looked at the Basel II as a set of internationally recognized framework that help banks in minimizing capital risk, market risk, and operational risk. Whereas Jenna (2013) referred to the Basel II as a framework aimed at helping financial institutions to absorb economic and financial shocks. Thus, the overall goal of the Basel II, and every other Basel framework is to improve enterprise risk management and governance of firms in the financial ecosystem.

Basel I's primary capital requirements were amended by its first pillar, which also addressed three different categories of risks to which banks are exposed. Its third pillar promoted disclosure and market discipline, which ensured transparency in the banking system and helped investors and customers distinguish between prudent and riskier banks. Its second pillar ensured supervisory review processes where banks concentrate on internal assessment. Olatunde (2015) further added that the Basel II, like its predecessor, was found to be a weak tool for ensuring the safety and soundness of the banking industry because it did not adequately protect banks from the risks associated with the procyclical nature of the economies, which are home to highly leveraged companies and sophisticated financial instruments. The 2007 financial crisis served as a reminder of the financial sector's inefficiencies and the need for greater regulation.

Basel Accord III

Basel Accord III represents a global regulatory framework for more resilient banks and banking systems, this became expedient as an precautionary measure against the reoccurrence of the global finance crisis of 2007 which exposed the many structural regulatory weakness in the existing banking structures. The report from the Bank for International Settlement (2010) explained that the Financial Crisis of 2007 was massive because banks had created an excessive on-and-off balance sheet leverage. This build-up was followed by a massive erosion of the quality and quantity of the capital base of these banks. The report also included that the banking system could not absorb the excessive credit losses, nor could they meet up with the exposures in the large off-balance sheet items. Thus, the weaknesses in the banking sector were rapidly transmitted to the rest of the financial system and the real economy. This led to a huge shortage in liquidity and availability of credit. Finally, there were large injections of liquidity by the public which led to huge liquidity risks by the public.

However, the Basel III was introduced in order to strengthen the regulatory global capital framework. This was done through developing on the three pillars of the Basel II framework. The reforms raise both the quantity and quality of the capital base requirement and risk coverage. Thus, further macroprudential guidelines are included into the capital framework in order to help contain the systemic risks from the interconnectedness of the financial institutions. The new regulations specifically targeted a more stringent minimum capital ratio and leverage component of the banks. The Basel III also included elements that help banks to supplement the risk-based capital requirement with a leverage ratio. The Bank of International Settlement (2022)

explained that the Basel III introduced CET1 as the highest-quality form of regulatory capital. This CET1 comprises of banks' common share capital, retained earnings, and other comprehensive income as well as other reserves. Notwithstanding, total capital of banks include Tier 1 and Tier 2 capital, whereas AT1 capital instruments include convertible debt instruments or preferred shares.

In addition to the requirements, the Basel III includes bank-specific Pillar 2 requirements which is aimed at addressing the risks that are not covered by Pillar 1. In all, the capital buffer and Pillar 2 are aimed at reducing the shortfalls of capital. According to Chang et al. (2019), an important attribute of the Basel III involves expunging quantitative risks from the Value at Risk (VaR) to expected shortfall (ES) as well as reducing risk's confidence level from 99% to 97.5%. Chang et al. (2019) explained further that the Basel Committee (2013) discovered that the VaR was found not to be able to fully measure the regulatory capital requirements and also capture tail risk. Therefore, as a result of the inability of VaR to measure tail risk, Expected Shortfall (ES) was then employed to stand in the gap.

Operational Efficiency

Dhillon and Vachhrajani (2012) explains that operational efficiency happens when the right combination of people, process, and technology come together to enhance the productivity and value of any business operation, while driving down the cost of routine operations to a desired level. For every bank to succeed, operational efficiency is essential. Banks may increase their operational effectiveness and maintain their competitiveness in a market that is changing quickly by utilizing technology, streamlining procedures, investing in employee training, making effective use of data, and offering top-notch customer service. These authors believe that investors can conduct transactions that get the market closer to the ultimate goal of wise capital allocation in an operationally efficient market without having their risk/reward ratios drastically reduced by high frictional costs. Unlike other authors such as Olatunde (2015), Mashamba (2018), and Bitar et al. (2015) that did not consider the operational efficiency of banks but their profitability as a measure of performance, this study places emphasis on how efficient banks perform. Kwan and Eisenbeis (1997) believes that efficient banks are expected to perform better in terms of market value than less efficient banks. Thus, an efficient bank would have a reduced risk when compared to a less efficient bank.

Empirical Review

Agbaeze and Onwuka (2014) examined why universal banking system was abolished in Nigeria with the implementation of the BASEL III. Specifically, the study looked at variables such as total capital ratio, core tier 1 capital ratio, and capital conservation buffers. The study proved that new rules on the minimum level and structure of banks capital will not negatively influence operations and performance of Nigerian banks. Ozili (2021) considered making the BASEL Accord III work in the Nigerian banking system by discussing on the significance of the implementation of the BASEL Accord III. The author advised that enough room should be given to banks for the implementation of the guideline and that prudential regulations should be provided both at the micro and macro levels.

Furthermore, Muraina (2018) also examined the determinants of the profitability of banks in the Nigerian economy within the purview of BASEL Accord. Like other studies in the Nigerian economy, panel data such as capital adequacy, credit risk, inflation, and return on assets. According to the study of Nwude and Okeke (2018) which was pegged on the impact of credit risk management, an important aspect of the provisions of BASEL Accord III, on the performance of banks in the Nigerian economy, it was established through the collection of secondary panel data and analysis made with

ordinary least square, that credit risk management had a positive and significant influence on total loans and advances as well as on return on assets and equity.

Oyetade et al. (2022) considered the impact of the changes in the BASEL capital requirements on the resilience of African commercial banks. The panel study had a temporal scope that spanned between 2000 and 2018 with a sample size of about 41 banks across the African continent. The BASEL transition from I, II, and III was looked at in the study viz-a-viz the CAMELS framework. The result of the panel logistic regression revealed that capital adequacy, liquidity, earnings, management efficiency, and macroeconomic conditions are the vital determinants of the resilience of commercial banks across Africa.

Stewart (2021) had a comparative study on the implementation of the various BASEL Accords in a collection of countries. The list of countries examined include Brazil, South Africa, Nigeria, the European Union, United Kingdom, and the United States of America. It was established in the study that the BASEL I have been fully implemented while BASEL II and BASEL III are concurrently implemented by some of these countries. Mashamba (2018) considered the effects of BASEL III liquidity regulations on the profitability of banks. The study sampled 40 banks in 11 different emerging markets between 2011 and 2016 using the Generalized Method of Moments (GMM). It was established from the result of the study that liquidity coverage ratio kept increasing in these emerging markets rather than decrease.

In the Ukraine economy, Ramskyi et al. (2017) considered how the country can integrate the BASEL III into its banking system. Specifically, they analyzed the degree to which these financial institutions implement and comply with the BASEL III framework. The National Bank of Ukraine was the major case study financial institution used in the study and the data collected were between 2014 and 2017 period. The regression result showed that bank regulatory changes as seen in the BASEL Accord III is effective in positively managing the possible financial crisis that may be experienced by the bank. Using the Vietnam economy, Trang et al. (2021) investigated the connection between bank liquidity and their operational efficiency. A panel dataset that ranged between 2010 and 2020 was collected and analyzed through the use of the panel regression model as well as the feasible general least squares. The study found that bank's liquidity is influenced by both internal and external variables with the former being more significant.

3.0 METHODOLOGY

The major research technique for this study is quantitative in nature, thus, the philosophy that best soothes this study is positivism. Positivism argues that the only trusted knowledge is gained through observation and measurement of subject matter. Therefore, because positivism depends on quantitative data, its findings are observable and quantifiable (Collins, 2010). The research design is the descriptive survey research design because it provides the researcher with better background information on the evaluation and findings of this study. For this study, secondary data based on the relevant variables of interest are extracted from the financial statement of the banks in both the EU and Nigeria.

Population and Sample of the Study

The population of this study comprises all banks in Nigeria. However, through purposive sampling technique, and specifically, based on the total assets of these banks, the study selects five banks, namely, Access Bank, First Bank, Guarantee Trust Bank (GTB), United Bank for Africa (UBA), and Zenith Bank.

Model Specification

The model specified for this study follows the model of Kwan and Eisenbeis (1997) which is given as; INEFFICIENCY = k(BADLOAN, GAP, CAPITAL, GROWTH, GROWTHSQ) where, BADLOAN represents the ratio of past-due and non-accrual loans to total loans; GAP is the absolute value of the difference between assets and liabilities that will mature or be repriced within one year, scaled by total assets; CAPITAL is the ratio of total equity to total assets; INEFFICIENCY is the estimate of firm-specific inefficiency from the stochastic cost frontier; GROWTH is the one-year growth rate of total loans; and GROWTHSQ is the square of one-year growth rate of total loans.

However, in order to provide for the Basel III framework, Kwan and Eisenbeis (1997)'s model is modified to incorporate the elements of the Basel III framework. The study's model is therefore given as;

Operational Efficiency = f(ES, credit risk, market risk, and liquidity risk). However, the model is econometrically given as;

$OE_{it} = \alpha_0 + \alpha_1 ES_{it} + \alpha_2 CR_{it} + \alpha_3 MR_{it} + \alpha_4 LR_{it} + \mu_{it}$

Where;

OE – operational efficiency, ES – Expected shortfalls, CR – credit risk, MR – market risk, LR – liquidity risk, μ – Stochastic error term, and α_0 – α_4 are parameters to be estimated.

Method of Data Collection

Data such as operational efficiency, ES, credit risk, market risk, and liquidity risk are gotten from the annual audited financial report of the selected banks in Nigeria between 2010 and 2022 and analyzed by using the fixed effect panel regression after due diagnostic tests were performed.

4.0 DATA ANALYSIS, FINDINGS, AND DISCUSSIONS

Descriptive Statistics

The descriptive statistics take the form of the measures of central tendencies, dispersion, and correlation matrix. In Table 1, summary of the measures of central tendencies as well as dispersions are presented.

Table 1 : Measure of Central Tendencies and Dispersion

	OE	ES	CR	MR	LR
Mean	0.460560	0.169363	0.271909	0.114964	51.94179
Maximum	0.934968	1.193410	0.983760	0.400998	3341.000
Minimum	0.108225	0.003993	0.005800	0.027882	0.071000
Std. Dev.	0.257598	0.198712	0.236887	0.101117	414.3318
Skewness	0.102301	3.063773	0.930074	1.512625	7.874998
Kurtosis	1.594268	14.53011	3.365841	4.095211	63.01560

Source: Researcher's Computation, 2023.

The descriptive statistics shows that Operational Efficiency (OE) in the Nigerian financial sector has an average value of 46.06% and this implies that, on the average, the industry performs a little below par but maximum OE was about 93.50% while the statistic was only 10.82% minimally. It can be asserted that the banking industry in Nigeria, irrespective of the regulation implemented, that is, whether Basel II or III, firms in the industry have positive operational performance. the Expected Shortfall (ES) serves as the alternative to the Value at Risk (VaR) as introduced in the Basel III and its implementation in the Nigerian banking sector brough about 16.94% provision for shortfalls on the average. The industry had more than 119% ES maximally while it provided for about 0.4% minimally for expected Basel III risk. Examining the standard

deviation in ES, the statistic reported 19.87% which is higher than the average ES and could imply that ES in the Nigerian economy is volatile.

Correlation Matrix

The correlation matrix is presented to show the correlational relationship among the variables employed in the study. Thus, in Table 2, a summary of the association among the variables is presented.

Table 2.Correlation Matrix

Covariance Analysis: Ordinary					
Correlation					
Probability	OE	ES	CR	MR	LR
OE	1.000000				

ES	0.167366	1.000000			
	0.1827	-----			
CR	0.220543	-0.145455	1.000000		
	0.0775	0.2476	-----		
MR	-0.024672	-0.148459	-0.017010	1.000000	
	0.8453	0.2379	0.8930	-----	
LR	0.139433	-0.098937	0.033157	-0.100043	1.000000
	0.2680	0.4330	0.7932	0.4278	-----

Source: Researcher's Computation, 2023.

The result of the correlational matrix shows that OE and ES have a positive (0.1673) but statistically not significant (0.1827) relationship while the same relationship was found between OE and CR with coefficient of 0.2205. These relationships show that although there is positive correlational relationship between OE and ES, and OE and CR respectively, the strength of the relationship was found to be weak and insignificant. Furthermore, OE and MR had a negative and very weak correlational relationship which is also found to be statistically not significant but the correlation coefficient between LR and OE was weak but not significant relationship. In addition to explaining the result of the correlational matrix, Table 2 shows that ES had negative correlational coefficient with CR (-0.1455), MR (-0.1485), and LR (-0.0989) respectively. These relationships are not just found to be negative but also weak and statistically not significant. However, CR and MR possess a negative, weak, and statistically not significant relationship with a coefficient of -0.0170, while CR and LR also had a weak, positive, but not significant correlation. Lastly, the correlation coefficient of -0.1004 between MR and LR implies that there is a negative, weak, and statistically insignificant relationship.

Unit Root Test

According to Choi (2001), panel unit root is not just applicable for stationarity but for testing the cointegration of variables. Thus, in order to estimate the cointegration among the application of Basel III framework in Nigeria on operational efficiency of banks, the study test the unit root of the variables using the Levin, Lin, and Chu criteria.

Table 3.Unit Root Test

	Level		**First Difference**		**Second Difference**		
Var	t-stat	prob	t-stat	prob	t-stat	prob	Remark
OE	-1.39249	0.0819	-4.50276	0.0000	-	-	I(1)
ES	4.4985	1.0000	-0.75184	0.2261	-4.56875	0.0000	I(2)
CR	-0.75914	0.2239	-2.07252	0.0191	-	-	I(1)
MR	-1.37181	0.0851	-2.48004	0.0066	-	-	I(1)
LR	-3.20878	0.0007	-	-	-	-	I(0)

Source: Author's Computation, 2023.

The result of the panel unit root test shows that there is mixed stationarity amongst the variables. Specifically, the result shows that OE, CR, and MR are stationary at first difference while LR is stationary at level but ES was found to be stationary at second difference.

Panel Cointegration

As a result of the unit root tests results, the study went further in investigating the cointegrating relationship among the variables through the use of Pedroni residual panel cointegration test and the results are displayed in Table 4.

Table 4.Pedroni Residual Panel Cointegration

Pedroni Residual Cointegration Test				
Alternative hypothesis: common AR coefs. (within-dimension)				
			Weighted	
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	-0.264928	0.6045	-0.486424	0.6867
Panel rho-Statistic	1.505375	0.9339	1.052293	0.8537
Panel PP-Statistic	-2.420235	0.0078	-2.709601	0.0034
Panel ADF-Statistic	-2.642245	0.0041	-0.779201	0.2179
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic	Prob.		
Group rho-Statistic	2.139518	0.9838		
Group PP-Statistic	-4.459758	0.0000		
Group ADF-Statistic	-1.551425	0.0604		

Source: Author's Computation, 2023.

The result of the cointegration test shows that there is a long-run cointegrating relationship among operation efficiency, expected shortfalls, credit risk, market risk, and liquidity risk of banks in the Nigerian economy. This is evident in the panel Phillip-Perron (PP) statistic and Panel Augmented Dickey Fuller (ADF) statistic with probability values of 0.0078 and 0.0041 respectively

Panel Diagnostic Tests

In a panel study, it is important to investigate the appropriateness of the different models ranging from the pooled regression, fixed effect regression, and the random effect regression. Therefore, in order to test for the more appropriate model between the fixed and random effect regression, the Hausmann specification test is employed.

Table 5.Hausman Specification Tests

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	46.822451	4	0.0000

Source: Author's Computation, 2023.

The Hausman specification test is with a null hypothesis that states that the random effect regression is more appropriate. However, from the result of the Hausman test

and with a chi-square probability value of 0.0000 which is significant, the stated null hypothesis is rejected. Therefore, from the result of the Hausman test, random effect regression is not as appropriate as the fixed effect regression. It is also important to test for the appropriate model between the fixed effect regression and the pooled OLS. This is done through the use of the Wald test with the null hypothesis that the pooled OLS is more appropriate than the fixed effect regression.

Table 6.Summary of Wald Test

Wald Test:			
Test Statistic	Value	df	Probability
F-statistic	28.19896	(4, 60)	0.0000
Chi-square	112.7958	4	0.0000

Source: Author's Computation, 2023.

The Wald test result shows a F-statistic value of 28.19896 with a probability value of 0.0000 and a chi-square value of 112.7958 and a probability value of 0.0000 which imply that the null hypothesis of the pooled OLS being appropriate is rejected while the fixed effect regression is considered the most appropriate for the study. Therefore, the study presents and explains the fixed effect regression result.

Presentation of Results

In Table 7, the study summarized the result of the fixed effect regression.

Table 7.Fixed Effect Regression Output

Dependent Variable: OE				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.609592	0.068489	8.900612	0.0000
ES	-0.145491	0.081609	-1.782774	0.0800
CR	0.099812	0.089594	1.114047	0.2700
MR	-1.356931	0.329889	-4.113291	0.0001
LR	8.60E-05	2.78E-05	3.096958	0.0031
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.517010	Mean dependent var		0.460560
Adjusted R-squared	0.448011	S.D. dependent var		0.257598
F-statistic	7.493041	Durbin-Watson stat		0.998055
Prob(F-statistic)	0.000001			

Source: Author's Computation, 2023.

The result of the fixed effect regression is explained in line with the objectives and hypothesis of the study.

Hypothesis One: Expected Shortfalls has no statistically significant effect on the operational efficiency of banks in Nigeria.

The result of the fixed effect regression shows that expected shortfall, a measurement of the implementation of Basel III in the Nigerian banking system was found to influence the operational efficiency of Nigerian banks negatively. The expected shortfalls explain the expected credit loss and from the result, it can be ascertained that Nigerian banks expected shortfalls affect operational efficiency negatively such that a percentage increase in the expected shortfalls of Nigerian banks would bring about 14.55% decrease in the operational efficiency of these banks. This relationship has a probability value of 0.0800 which implies that, using the 5% level of significance, the implementation of Basel III has no significant effect on the operational efficiency of banks in the Nigerian economy.

Hypothesis Two: Credit risk does not have any statistically significant effect on operational efficiency of Nigerian Banks.

The result of the fixed effect regression produced a coefficient of 0.099812 in respect of credit risk with a probability value of 0.2700. With this, it can be asserted that credit risk has a positive but not significant effect on the operational efficiency of Nigerian banks such that when credit risk is increased by 1 percent, operational efficiency of Nigerian banks will increase by 9.98% but this influence is found to be statistically insignificant.

Hypothesis Three: Market risk has no statistically significant effect on operational efficiency of Nigerian banks.

From the result of the regression, it is established that market risk possessed a negative coefficient of -1.356931 and a probability value of 0.0001. It can be asserted that market risk influences the operational efficiency of Nigerian banks by -135.69% should market risk changes by 1 percent. The probability value of 0.0001 implies that market risk significantly influences the operational efficiency of banks in the Nigerian economy.

Hypothesis Four: Liquidity risk has no statistically significant effect on the operational efficiency of Nigerian banks.

Liquidity risk in the Nigerian banking sector was found to possess a coefficient of 0.000086 with a probability value of 0.0031 and this implies that there is a positive and significant relationship between liquidity risk and the operational efficiency of banks in the Nigerian economy. Also, it implies that efficient liquidity risk management, when increased by one percent, could also improve the operational efficiency of banks in Nigeria by 0.0086% and this relationship is found to be statistically significant.

Discussion of Findings

Expected shortfalls in Nigeria was found to impact the operational efficiency of banks negatively. This indicates that the expected loss impacts operational performance adversely. Specifically, the Nigerian banks would perform below optimal given that there is an increase in the expected loss. This is theoretically valid and empirically ascertained as increases in shortfalls would naturally influence the operational efficiency of these banks adversely especially during the period of market stress. This finding was also found in the case of the banks in EU but with a statistically significant outcome. This finding is against what Toby and Danjuma (2021) found in their study. Agbaeze and Onwuka (2014) and Thuinbi (2014) also found that the implementation of Basel III in the Nigerian economy helped in the better management of risk through the expected shortfall but these findings proved otherwise for Nigeria.

CONCLUSION AND RECOMMENDATIONS

The study has investigated the effect of the implementation of Basel III on the operational efficiency of banks in Nigeria. Basically, the Basel III framework, despite its advantages in providing banks with effective risk management strategies is plagued with an undesirable potential increase in its liquidity requirements which in turn decreases performance or operational efficiency. Thus, banks are expected to hold an optimal level of liquidity so as to improve efficiency. Therefore, there are a number of conclusions derived from this study and they include the following: expected shortfalls had a positive but not significant impact on operational efficiency in Nigeria. Also, credit risk possessed positive but not significant effect on operational efficiency in Nigeria. Furthermore, market risk influences operational efficiency in Nigeria while it can be concluded that liquidity risk affects operational efficiency positively.

From the findings of the study, the following are outlined as policy recommendations.

i. Basel III framework should be fully implemented in the Nigerian economy so as to avoid price distortions in the capital market.

ii. Nigerian banks should endeavour to introduce standardized policies that could curb the negative influence of expected shortfalls in the financial sector.

iii. Effective credit risk management is suggested for banks in Nigeria. This will reduce the negative influence of credit risk on the operational efficiency of these banks.

References

Abba, G. O., Okwa, E., Soje, B., & Alkpitanyi, L. N. (2018). Determinants of capital adequacy ratio of deposit money banks in Nigeria. *Journal of Accounting & Marketing, 7*(2) 1 – 7.

Adamgbo, S. L. C., Toby, A. J., Momodu, A. A., Imegi, J. C. (2019). The effect of capital adequacy on credit risk management among commercial banks in Nigeria: Within the Basel capital adequacy framework. *International Journal of Contemporary Research and Review, 10*(7), 21555 – 21562.

Agbaeze, E. K., & Onwuka, I. O. (2014). Basel III and abolition of universal banking model – Implication for Nigerian banks. *IOSR Journal of Economics and Finance, 2*(5), 01 – 15.

Akbay, S. (2021). CRR/CRD IV: An empirical analysis on the impact of the regulatory requirements on the dividend policy and pay out of European banks. Master Dissertation, Universidad Catolica De Murcia.

Alexander, K. (2014). Stability and sustainability in banking reform: Are environmental risks missing in Basel III? *Zurich Open Repository and Archive*, Cambridge: CISL UNEP.

Atoi, N. V. (2018). Non-performing loan and its effects on banking stability: Evidence from national and international licensed banks in Nigeria. *CBN Journal of Applied Statistics, 9*(2), 43 – 74.

Barth, J. R., Caprio, G. & Levine, R. (2004). Bank regulation and supervision: What works best? *Journal of Financial Intermediation, 13*(2), 205 – 248.

Basel Committee on Banking Supervision (2010). Basel III: A Global Regulatory Framework for more Resilient Banks and Banking Systems. Bank for International Settlements.

Basel Committee on Banking Supervision (2022). Evaluation of the impact and efficacy of the Basel III reforms. Bank for International Settlements.

Basel Committee on Supervision (2023). The Basel Framework. Bank for International Settlements.

Bitar, M., Pukthuanthong, K., & Walker, T. (2017). The effect of capital ratios on the risk, efficiency and profitability of banks: Evidence from OECD countries. *Journal of International Financial Markets, Institutions & Money*, 1 – 60.

Blouchoutzi, A., & Nikas, C. (2014). Emigrants' remittances and economic growth in small transition economies: The cases of Moldova and Albania. *East-West Journal of Economics and Business, 17*(2), 97-117.

Chiti, M. P., & Santoro, V. (2019). The Palgrave Handbook of European Banking Union Law. Palgrave: Macmillan.

Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance, 20*(1), 249 – 272.

Dhillon, A. S., & Vachhrajani, H. (2012). Impact of operational efficiency on overall profitability - A case study of GIPCL. *AMRITA School of Business Working Paper No. 136/2012*, 1 – 28.

Feridum, M., & Ozun, A. (2020). Basel IV implementation: A review of the case of the European Union. *Journal of Capital Markets Studies, 4*(1), 7 – 24.

Frondel, M., & Vance, C. (2010). Fixed, random, or something in between? A variant of Hausman's specification test for panel data estimators. *Ruhr Economic Papers, 160*, 1 – 12.

Godswill, O., Ailemen, I., Osabohien, R., Chisom, N., & Pascal, N. (2018). Working capital management and bank performance: Empirical research of ten deposit money banks in Nigeria. *Banks and Bank Systems, 13*(2), 49 – 61.

Guru, B. K., & Yadav, I. S. (2018). Financial development and economic growth: Panel evidence from BRICS. *Journal of Economics, Finance and Administrative Science, 24*(47), 113 – 126.

Herman, K., & Tulung, J. E. (2019). The effect of banking risk on Indonesia's regional development banks. *Munich Personl RePEc Archive*, 1 – 15.

Katarzyna, B., & Johannes, K. (2018). Macroprudential regulation in the European Union in 1995 – 2014: Introducing a new data set on policy actions of a macroprudential nature. *ECB Working Paper, No. 2123*, Frankfurt.

Lastra, R. M. (2019). Multilevel governance in banking regulation. In The palgrave handbook of European banking union law, 3 – 17.

Lotto, J. (2018). The empirical analysis of the impact of bank capital regulations on operating efficiency. *International Journal of Financial Studies,6*(34), 1 – 11.

Mashamba, T. (2018). The effects of Basel III liquidity regulations on banks' profitability. *Journal of Governance and Regulation, 7*(2), 34 – 48.

Muraina, S. A. (2018). Determinants of listed deposit money banks' profitability in Nigeria. *International Journal of Finance and Banking Research, 4*(3), 40 – 56.

Nocco, B. W. & Stulz, R. M. (2006). Enterprise risk management: Theory and practice. *Journal of Applied Finance, 18*(4), 8-20.
Nwude, E. C., & Okeke, C. (2018). Impact of credit risk management on the performance of selected Nigerian Banks. *International Journal of Economics and Financial Issues, 8*(2), 287 – 297.
Olaniyan, T. O., Ijaiya, M. A., and Kolapo, F. T. (2022). Remittances, financial sector development, institutions and economic growth in the ECOWAS region. *Migration Letters, 19*(2), 207 – 234.
Oloye, M. I., & Osuma, G. (2015). Impacts of Mergers and Acquisition on the Performance of Nigerian Banks (A Case Study of Selected Banks). *Pyrex Journal of Business and Finance Management Research, 1*(4), 23-40.
Oyetade, D. (2020). The potential impact of Basel IV requirements on performance and resilience of commercial banks in Africa. Ph.D. Thesis, University of Kwazulu-Natal.
Oyetade, D., Obalade, A. A., & Muzindutsi, P. (2020). Impact of the Basel IV framework on securitization and performance of commercial banks in South Africa. *Banks and Bank Systems, 15*(3), 95 – 105.
Oyetade, D., Obalade, A. A., & Muzindutsi, P. (2022). The impact of changes in Basel capital requirements on the resilience of Africa commercial banks. *Scientific Annals of Economics and Business, 69*(1), 111 – 132.
Ozili, P. K. (2021). Basel III in Nigeria: Making it work. *CBN Bullion, 45*(1), 16 – 23.
Partovi, E., & Matousek, R. (2019). Bank efficiency and non-performing loans: Evidence from Turkey. *Research in International Business and Finance, 48*(1), 287 – 309.
Pyle, D. H., (1997). Risk management theory. *Research Program in Finance Working Paper*, RPF 272 University of California Berkeley.
Ramskyi, A., Loiko, V., Sobolieva-Tereshchenko, O., Loiko, D., & Zharnikova, V. (2017). Integration of Ukraine into the European banking system: Cleaning, rebooting and Basel III. *Banks and Bank Systems, 12*(4), 163 – 174.
Ratnawati, K. (2020). The impact of financial inclusion on economic growth, poverty, income inequality, and financial stability in Asia. *Journal of Asian Finance, Economics and Business, 7*(10), 73 – 85.
Senior Supervisors Group (2009). Risk management lessons from the global banking crisis of 2008. Retrieved from https://www.sec.gov/news/press/2009/report102109.pdf
Shi, X., Emrouznejad, A., & Yu, W. (2021). Overall efficiency of operational process with undesirable outputs containing both series and parallel processes: A SBM network DEA model. *Expert Systems Application, 178*(1), 115062.
Stewart, C. A. (2021). A comparative study of the implementation of the Basel Accords in various countries. Master Dissertation, University of Johannesburg.
Toby, A. J., & Jibaniya, K. D. (2021). Liquidity management, Basel capital adequacy and financial distress resolution in the Nigerian banking industry. *Journal of Finance and Accounting, 9*(4), 154 – 171.
Trang, L. T., Nhan, D. T., Hao, N. N., & Wong, W. (2021). Does bank liquidity risk lead to bank's operational efficiency? A study in Vietnam. *Advances in Decision Sciences, 25*(4), 1 – 43.
Udoka, C. O., &Orok, A. B. (2017). Assessment of the enterprise risk management (ERM) in the Nigerian banking industry. *Asian Journal of Economics and Empirical Research, 4*(2), 68 – 74.
Umar, H., & Dikko, M. U. (2018). The effect of internal control on performance of commercial banks in Nigeria. *International Journal of Management Research & Review, 8*(6), 13 – 32.
Wang, M. (2021). Evaluation of the impact of banking regulation on the stability of banking sector in CEE EU members. Master Thesis, Charles University in Prague and University College London.
Zhang, L., Du, X., Chiu, Y., Pang, Q., Wang, X., & Yu, Q. (2022). Measuring industrial operational efficiency and factor analysis: A dynamic series-parallel recycling DEA model. *Science of the Total Environment, 851*(1), 1 – 11.
Zhou, X., Xu, Z., Chai, J., Yao, L., Wang, S., & Lev, B. (2019). Efficiency evaluation for banking systems under uncertainty: A multi-period three-stage DEA model. *Omega, 85*, 68 – 82.