Scholars Journal of Economics, Business and Management OPEN ACCESS
Abbreviated Key Title: Sch J Econ Bus Manag
ISSN 2348-8875 (Print) | ISSN 2348-5302 (Online)
Journal homepage: https://saspublishers.com/journal/sjebm/home

Implications of Basel Iii Capital Provisions on Bank Risk Management Practices among Nigeria Commercial Banks

Dr. S.L.C Adamgbo[1], Prof. A. J. Toby[2], Dr. J. I. Kenn-Ndubuisi[3*]

[1]Department of Banking & Finance Kenule Beeson Saro-Wiwa Polytechnic, Bori
[2,3]Department of Banking & Finance Rivers State University, NkpoluOroworoku, Port Harcourt

DOI: 10.36347/sjebm.2019.v06i09.003 | **Received:** 09.09.2019 | **Accepted:** 22.09.2019 | **Published:** 28.09.2019

***Corresponding author:** Juliet Kenn-Ndubuisi

Abstract **Original Research Article**

This study examined the implications of Basel III on Bank Risk Management Practices among Nigerian Commercial banks. The major aims of this study were to find empirical evidence to which effective implementation of Basel III will affects bank risk management and how commercial banks in Nigeria can enhance their risk management practices. Considering the nature of the survey, the quantitative method of research was adopted; the quasi-experimental research design. In attempt to achieve the objectives of the study, time series data were obtained from the secondary sources. The data were analysed using the certain econometric tests. From the tests we find out that there exists a significant unidirectional relationship between Basel protocols and bank risk management. This implies that Basel III Capital Provisions if adopt would have strong significant and statistical influence on bank risk management practices. Our finding shows that Credit Risk among others was found to be the most critical to bank stability and survival. The study concludes that for the success of operations, stability and survival, commercial banks should be encouraged to maintain adequate capital provisions as spelled out in the Basel III proposition in order to remain active and avert risk of failure and eminent bank crisis leading to financial crisis. Particularly that loan defaulters be prosecuted given the high rate of credit risk factor to bank growth and survival. Above all, bank regulators and operators should collaborate to put in place implementation measures to usher-in Basel III in Nigeria banking scene.

Keywords: Basel Capital Accords, Adequacy Bank Risks, stability, Liquidity.

INTRODUCTION

Evidences from countries have shown that International best practices such as Basel provision are effective measures to cushion bank risk-taking behaviour and enhancement of efficient risk management. Toby, A.J. [1] argued that the introduction of Basel is a major driver for the refinement and maturation of risk management in the banking system. Basel III was introduced in 2008 after the Global Financial Crisis (GFC) for banks to be more resilient by refining their capital structure and built mechanism for risk management. According to Atik [2] Basel III incorporated the lessons learned from the GFC which resulted in liquidity and credit crunch. Adding that the arrival of Basel III signals an unprecedented rising of the bar for risk management practice to support the comprehensive nature of the new requirements.

The need for a higher capital standards as specified by the Basel Committee on Bank Supervision (BCBS) become necessary in view of the volatility of the global market, technological advancements, innovations, new financial products and changing regulatory environments demand that risk management be a critical task for the banking institutions. Admati, *et al*. [3] remarks that Basel capital provisions and deductions compliance can enhance banks' liquidity, credit and operating risk management if adopted.

Sanni and Oladipo [4] maintained that risk management processes in banks include, exposures identification, data gathering, evaluation and strategic development, implementation and performance of evaluation.

BCBS [5] stressed that the main aim of Basel III was to maintain banks' solvency by strengthening regulation, supervision and risk management in the banking sector. According Ho, Capital Conservation Buffer one of the component of Basel III is designed to ensure that banks build up capital buffers outside period of stress which can be used to absorb losses (risk) when it happen [5]. Kock and MacDonald [6] noted that

banks' risks generate harmfully influences to the financial institution's probability, market value, liabilities and shareholder's fund.

Afriye&Akotey [7] argued that efficient risk management is crucial and valuable for banks to improve their performance and reduce the damage caused by risk. BCBS [5] asserts that the implementation of Basel III is part of the committee continue effort to enhance the banking regulatory framework builds on international convergence of capital requirement and standards. Basel III is an international convergence measures propositions designed to improve bank risk management appetite.

Basel III provisions provide a global liquidity standards that are geared toward making bank have sufficient high quality liquid resources to survive under acute stress scenarios. Hull [8] holds that before the Basel capital accord, large banks in major countries seemed to hold insufficient capital relative to the risks they were taking, especially in light of the aggressive competition for market share in the international market.

As a result of many failed banks during the Global financial crisis including some larger banks who merely survive by the substantive "bailout", risk management in banking has witnessed tremendous changes. The reason had been the public outcry over the use of public funds to bail out banks [9].

Basel III was published in 2009 to be implemented by both domestic and International banks in phases according to the dictate of individual country regulators. The final phase according the provisions is expected to be entrenching in September, 2019, hence the need to assess its workability in cushioning risk. Therefore this study seeks to contribute to the literature by examining the relationship between Basel III provisions and risk management among commercial banks in Nigeria. The time series data (1989 - 2015) from the Nigeria Stock Exchange (NSE) is used.

This study among other things seeks to provide answers to the following questions;

- What would be the implications of Basel III on banks risk management in Nigeria if adopted?
- What is the relationship between Basel III capital provisions and bank risk management among Nigerian commercial banks?

CONCEPTUAL/ THEORETICAL FRAMEWORK

Basel III was introduced in response to the subprime financial crisis of 2007/2008 and also to address the short-coming of Basel II BCBS [5]. Fees & Itege [10] asserted that many banks that failed during the global financial crisis and few others who survived only out of the government "bailout". Basel III provisions is in line with the Buffer theory of capital adequacy whose objective is to ensure that banks capital is adequate to withstand and absorb shocks both monetary and macro-economic that banking operation is very sensitive.

The Buffer theory of Calem and Rob [11] predicts that a bank approaching regulatory minimum capital ratio may have an incentive to boost capital and reduce risk. The Federal Reserve Bank (FRB) holds that Basel III introduced stricker requirements and standard models used in majorly US banks to curb bank failure and effective management of its risk exposure.

The Fractional Reserve theory of banking a practice which holds that a bank accepts deposit, make loans (risk assets), or investments and hold reserves equal to a fraction of its deposits liabilities is in line with Basel propositions with improved capital standards for banks to hold sufficient capital.

The portfolio management theory emphasized that bank as financial intermediary is considered as a portfolio of securities. It's assumed that banks' portfolio is composed of one risky and a risk free security. This under scored the fact that the risky assets of banks being loans and advances expose it to losses capable of triggering or sparking the financial instability is effective managed.

Basel III was introduced in response to the sub-prime financial crisis of 2007/2008 and to address the short-coming of Basel II. Lessons from the GFC reminded regulators of the existence of moral hazard and forbearance in bank regulation [10]. The Basel committee realized that the prudential regulation of banks has come under renewed scrutiny and a major overhaul of Basel II was on the call. This led to the new Basel Accord III with enormously sticker capital requirements and new rules. Basel III framework imposes higher capital ratios and new criteria but majorly follow the direction adopted by Basel II Accord. However, capital requirements became more accurate and subject banks to the true credit risk afforded by each individual back asset [10].According to Hull [8] the final version of Basel III covers; capitals definition, capital conservation buffer, countercyclical Buffer, leverage ratio, liquidity ratio and counterparty credit risk.

Basel III introduced a global liquidity standard including two liquidity ratios designed to make sure banks have sufficient high quality resources to survive under acute stress scenario. The ratios are liquidity, coverage and net stable funding ratios (LCR & NSFR) respectively [5].

Besides, the inconsistency in the definition of capital across jurisdictions and lack of disclosure that could allow the market proper assessed and compared the quality of capital between the institution and other

aspects that needed to be considered after the crisis Basel III in addition to the new liquidity ratio required that bank total capital should consist of Tier I, Tier II, to include share capital and retained earnings but does not include goodwill to deferred tax asset [8].

EMPIRICAL REVIEW

John, Leventides and Anna, Donatou [12] examined the impact of Basel Accord on Greek Banks, the study grouped bank portfolio into three categories; large, medium and small size. The results obtained shows that an increase of credit risk during the crisis periods; and the differentiation of bank risk according size of the organization and additional capital standards will be needed in order to hedge risk.

Asli, Demirque-KuntEnrica Detraginche & Thierry Tressel [9] examined whether compliance with Basel core principles for effective Banking supervision will improve banking soundness. The authors found out that there is a positive significant relationship between bank soundness and compliance with Basel core principles.

Asli Demirqui-Kunt *et al*. [13] studied whether compliance with Basel core principles for effective banking supervision is associated with bank soundness using data for over 3,000 banks in 86 countries. Their findings indicate that neither the overall index of BCP compliance nor its individual components are robustly associated with bank risk measured by Z-scores.

Kevin, N, Kombo [14] assessed the effects of Basel III framework on capital adequacy requirement in commercial banks in Kenya using a descriptive survey discovered that capital adequacy requirement in commercial banks in the studied country is important because its lead to bank stability. The result also unveils that Basel III capital adequacy provisions improved credit risk management. He therefore recommended that banks should pursue various strategies in ensuring that they are incompliance with Basel III requirements and prudential guidelines in Kenya.

Ahmad and Ariff [15] examined key determinants of credit risk of commercial banks on emerging economy banking systems compared with those of the developed economies. Their finding concludes that an increase in loan loss provisions is a significant determinant of potential credit risk. Also, they maintained that enhanced loan loss provisions is essentially the content of Basel III for banks to provide sufficient funds in event of losses which is in line with the earlier work of Ahmed, Takeda and Shawn [16].It was discovered that loan loss provision has a positive influence on non-performing loans. Therefore they concluded that an increase in credit risk and deterioration in the quality loans consequently affect bank performance.

Guidara, Lai and Sournare [17] investigated banks' performance, risk and capital buffer under business cycles and banking regulation in Canada. They concluded that Canadian banks were well capitalized and that explains why Canadian banks were insulated for the Global Financial Crisis that plagued banks worldwide within 2007/2008.

Saibal, G [18] examined risk capital and financial crisis of 100 GCC banks between 1996 – 2011 with the relationship between risk and capital. They employed a 3 SLS models in estimating the inter link between risk and capital. The study reveals that bank generally increase capital in response to an increase in risk and not vice versa. The result shows that there is an even impact of regulatory pressure on market discipline on banks' attitude toward risk and capital. They found that banks that depend largely on wholesale funds less diversified income profile has high risk and also suffer its consequences.

METHODOLOGY

This study used time series data obtained from annual report of fifteen (15) quoted commercial banks in Nigeria as compiled and expressed in ratios by the Nigeria stock exchange (NSE). Spans from 1989 – 2015. This study investigates the existence of a dynamic relationship between Basel III capital adequacy provisions and bank risk management. Studies have shown that macro-monetary economic time series data usually exhibit stochastic trend that can be removed through differencing. We therefore employed the Augmented Dickey Fuller (ADF) approach to test the order of integration of the variables. We then proceed to test the order of cointegration using the Johansen cointegration approach which contains like hood ratio test of statistic, the maximum eigen value and the trace statistic were also used to determine the existence of a long run equilibrium relationship among the variables taking into cognizance the effects of including intercept and trend in the entire five deterministic trends recommended in the Johansen Cointegration test which is a more robust test than Engel Granger (EG) in testing cointegration relationship.

The efficacy of VAR model in establishing the relationship among variables was considered appropriate in this study. The granger test was carried out to analyze the statistical link between Basel III capital adequacy ratios and bank risk management. The Impulse Response Function (IRF) was conducted to analyze the response of the bank risk management indicators to Basel III capital adequacy. The variance decomposition test was conducted to show how much percentage of the total variance is explained by each component. A test that help also to determine the direct and indirect effects between the variables. The test demonstrates the proportion of the forecast error

variable of a variable that is attributable to its innovation and those of other variables.

Operational measurement of variables

Dependent variables

- Credit Risk (CR); this comprises the uncertainties due to borrowers default on a loan or other line of credit.
- Market Risk (MTR); This risk is concerned with decreasing value of an investment due to changes in the market factors such as; equity risk, interest, exchange rate. Etc. the common measure of MTR is value at Risk which measure how the market value of an asset or portfolio is likely to decrease over time.
- Operational Risk (OPR); this is risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. Basel II provides two approaches for measuring operational risk;
- Liquidity Risk (LIQR); this is risk that a given security or asset cannot be traded quickly enough in the market to prevent a loss or when bank is unable to meet its commitments as they fall due. This risk could be funding or market based liquidity risk. It is funding when the firm is unable to meet its current and future cash flow without distortion in its daily operations. While it is market based liquidity risk when a firm cannot easily offset or sell a portion without incurring a loss due to inadequate depth in the market; liquidity risk is view from Regulatory Liquidity Indicators (RLL), Cash Reserve Requirement (CRR), and Statutory Liquidity Ratio (SLR) etc.

DEPENDENT VARIABLES

Basel capital Reserves (provisions); Basel stipulated that banks maintain certain amount of capital as reserves in the form;

- Leverage Ratio (LR)
- Liquidity Coverage Ratio (LCR)
- Minimum Payout Ratio (MPR)
- Net Stable Funding Ratio (NSFR)
- Pledge Deposits (DP)

MODEL SPECIFICATION

From the objectives of this study, the models specified below captures the four (4) types of risk facing the commercial banks in its operation.

RISK =f (BASEL III) (1.1)

Reserve capital - Provisions

CR = f (LR, LCR, MPR, NSF, PD) – (Basel III) (1.2)

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$

$CR = \beta_0 + \beta_1 LR + \beta_2 LCR + \beta_3 MPR + \beta_4 NSF + \beta_5 PD + \mu_t$ (1.3)

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$

$OPR = \beta_0 + \beta_1 LR + \beta_2 LCR + \beta_3 MPR + \beta_4 NSF + \beta_5 PD + \mu_t$ (1.4)

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$

$LIQR = \beta_0 + \beta_1 LR + \beta_2 LCR + \beta_3 MPR + \beta_4 NSF + \beta_5 PD + \mu_t$ (1.5)

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$

$MKTR = \beta_0 + \beta_1 LR + \beta_2 LCR + \beta_3 MPR + \beta_4 NSF + \beta_5 PD + \mu_t$ (1.6)

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$

Where:

CR = Credit Risk
OPR = Operational Risk
LIQR = Liquidity Risk
MKTR = Market Risk
LR = Leverage Ratio
LCR = Liquidity Coverage Ratio
MPR = Maximum Payout Ratio
NSF = Net Stable Funding Ratio
PD = Pledge Deposits
μ = Error Term
β_0 = Regression Intercept
$\beta_1 - \beta_5$ = Coefficient of the Independent Variables to the Dependent Variables

RESULT AND DISCUSSION

The Unit Root Result

Table-1.1: Unit Root Test Result

Variables	Augmented Dickey-Fuller test statistic			
	Level	Prob.	1st Diff	Prob
CR	-3.421012***	0.0136	-	-
TIER 1	-3.313864**	0.0212	-	-
TIER II	-3.385016**	0.0176	-	-
LCR	-2.302872	0.1785	-3.511412**	0.0108
CCB	-1.973955	0.1564	-3.908302***	0.0011
LR	-4.192549***	0.0032	-	-
MTC	-1.986388	0.1609	-3.515495**	0.0256
CB	-3.893181***	0.0036	-	-
OPR	-3.084227**	0.0107	-	-
MPR	-5.092594***	0.004	-	-
LIQR	-3.725868**	0.0361	-	-
MKTR	-4.688832***	0.0051	-	-
NSF	-4.898979***	0.0006	-	-
PD	-3.618734**	0.0127	-	-

Note:*, **, *** statistically significant at 10%, 5% and 1% significant level

The result from the stationarity test therefore calls for long-term relationship. The unit root result in table 1.1 above indicates that all the variables were stationary at level except leverage coverage ratio (LCR), capital conservation Buffer (CCB) and Minimum Total Capital ratio (MTC) that were stationed at first difference at 5% and 1% level of significance.

Cointegration Test

We used the approach of Johansen and Juselius [19] which contains likelihood ratio test of statistic, the maximum eigenvalue and the trace statistic to determine whether long run relationship exists among the variables taking into consideration the effects of including intercept and trend in models as the entire five deterministic trends recommended in the Johansen cointegration test is a more robust test than Engel Granger (EG) in testing for cointegrating relationship. We shall consider each based on the three specified models (capital adequacy measures, Capital reserves and capital deductions) the table above provides the summary of the results obtained across the different levels for capital adequacy model.

Table-1.2: Johansen Cointegration Result for Capital Reserves

Series: CR LR LCR MPR NSF PD				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.906665	136.6167	95.75366	0.0000
At most 1 *	0.727562	77.32772	69.81889	0.0111
At most 2	0.613075	44.81910	47.85613	0.0938
At most 3	0.381096	21.08099	29.79707	0.3526
At most 4	0.299496	9.085858	15.49471	0.3575
At most 5	0.007451	0.186963	3.841466	0.6655
Series: OPR LR LCR MPR NSF PD				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.953125	151.4269	95.75366	0.0000
At most 1 *	0.729333	74.92019	69.81889	0.0185
At most 2	0.593467	42.24853	47.85613	0.1519
At most 3	0.352540	19.74630	29.79707	0.4402
At most 4	0.218407	8.878838	15.49471	0.3767
At most 5	0.103030	2.718313	3.841466	0.0992

Series: LIQR LR LCR MPR NSF PD				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.922154	149.8885	95.75366	0.0000
At most 1 *	0.788471	86.06290	69.81889	0.0015
At most 2	0.626200	47.22802	47.85613	0.0572
At most 3	0.372398	22.62717	29.79707	0.2649
At most 4	0.333388	10.98093	15.49471	0.2127
At most 5	0.033129	0.842250	3.841466	0.3588
Series: MKTR LR LCR MPR NSF PD				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.940159	190.5098	95.75366	0.0000
At most 1 *	0.863998	120.1080	69.81889	0.0000
At most 2 *	0.793443	70.23083	47.85613	0.0001
At most 3 *	0.490671	30.80138	29.79707	0.0382
At most 4	0.368572	13.93484	15.49471	0.0847
At most 5	0.093008	2.440552	3.841466	0.1182

The above cointegration result showed that equilibrium relationship exists for maximum of three variables between Basel Capital Reserves and Bank risk management practice.

Result of the VAR model

All the six variables listed above are considered as endogenous variables for VAR models with assumptions that all these variables are interrelated. We assume that since bank risk management practice are influenced by Basel capital requirements; we considered the impact of the accumulated lag values of Basel capitals on the selected bank risk management practice indicators.

Table-1.3: VAR model for Selected Basel Capital Reserves and Bank Risk Management Practice

	C	LR	LCR	MPR	NSF	PD
CR	0.881400	-2.107226	2.666949	34.90915	7.603644	1.119999
	(4.76977)	(20.5363)	(3.42757)	(26.2970)	(3.27539)	(3.01808)
	[0.18479]	[-0.10261]	[0.77809]	[1.32750]	[2.32145]	[0.37110]
OPR	3.134591	22.65682	4.640638	29.97638	6.493080	1.807138
	(3.97452)	(21.0280)	(3.30069)	(23.9521)	(3.00398)	(2.55851)
	[0.78867]	[1.07746]	[1.40596]	[1.25151]	[2.16149]	[0.70633]
LIQR	5.271341	37.56574	5.926850	16.45018	5.788495	2.481691
	(6.15969)	(17.7139)	(3.47309)	(23.4399)	(2.91678)	(2.81774)
	[0.85578]	[2.12069]	[1.70651]	[0.70180]	[1.98455]	[0.88074]
MKTR	16.17250	20.39759	5.857162	25.87369	6.154122	1.423940
	(7.21638)	(19.1183)	(3.19590)	(20.6891)	(2.33817)	(2.47103)
	[2.24108]	[1.06691]	[1.83271]	[1.25059]	[2.63203]	[0.57625]

The above table shows that Net Stable Funding Ratio has a significant influence on credit risk, operational risk and market risk while Leverage Ratio influenced liquidity risk. This is an indication that net stable funding ratio has a strong influence on bank risk management practice.

The Granger Causality Test Result

To analyze the statistical causality link between bank risk management practice and the selected variables of Basel capital, we will perform bivariate Granger Causality Test. The Granger [20] approach assesses whether past information on one variable helps in the prediction of the outcome of some other variable, given past information on the latter. It is important to note that the statement "x Granger causes y" does not imply that y is the effect or the result of x. Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term.

Table-1.4: Granger causality test result between Bank Risk Management Practice and selected Basel Capital Reserves

Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
LR does not Granger Cause CR	25	0.14895	0.8626
CR does not Granger Cause LR		3.07878	0.0683
Null Hypothesis:	Obs	F-Statistic	Prob.
LR does not Granger Cause OPR	25	3.29012	0.0582
OPR does not Granger Cause LR		0.24450	0.7854
MPR does not Granger Cause MKTR	25	3.62270	0.0454
MKTR does not Granger Cause MPR		0.95512	0.4016

The above Table 4.4b indicates that out of the selected Basal capital reserve variables, there exists unidirectional relationship between credit risk and leverage ratio. That is credit risk Granger causes leverage ratio (LR) only at 10% levels. For operational risk, also a unidirectional relationship exists between operational risk and leverage ratio but in this case leverage ratio granger causes operational risk at 10% levels. There was no causal relationship between liquidity risk and the selected Basel capital Reserves and liquidity risk. The result also showed that maximum payout ratio (MPR) granger causes market risk at 5% levels.

Impulse Response Function (IRF)

In this section, the response of the selected bank risk indicators (i.e. credit risk, market risk, operational risk and liquidity risk) to Basel capital is reassessed. Since according to Sims, most estimated coefficients from VAR model are not statistically significant. Therefore impulse response functions are dynamic simulations showing the response of an endogenous variable over time to a given shock. That is, it helps in tracking the contemporaneous and future paths of the key response variables to a one standard deviation increase in the current value of the stimulus variable. Thus, attempt is made to examine the effect of capital adequacy measures (i.e. Capital adequacy measures, capital reserves and capital deductions) on credit risk, market risk, operational risk and liquidity risk.

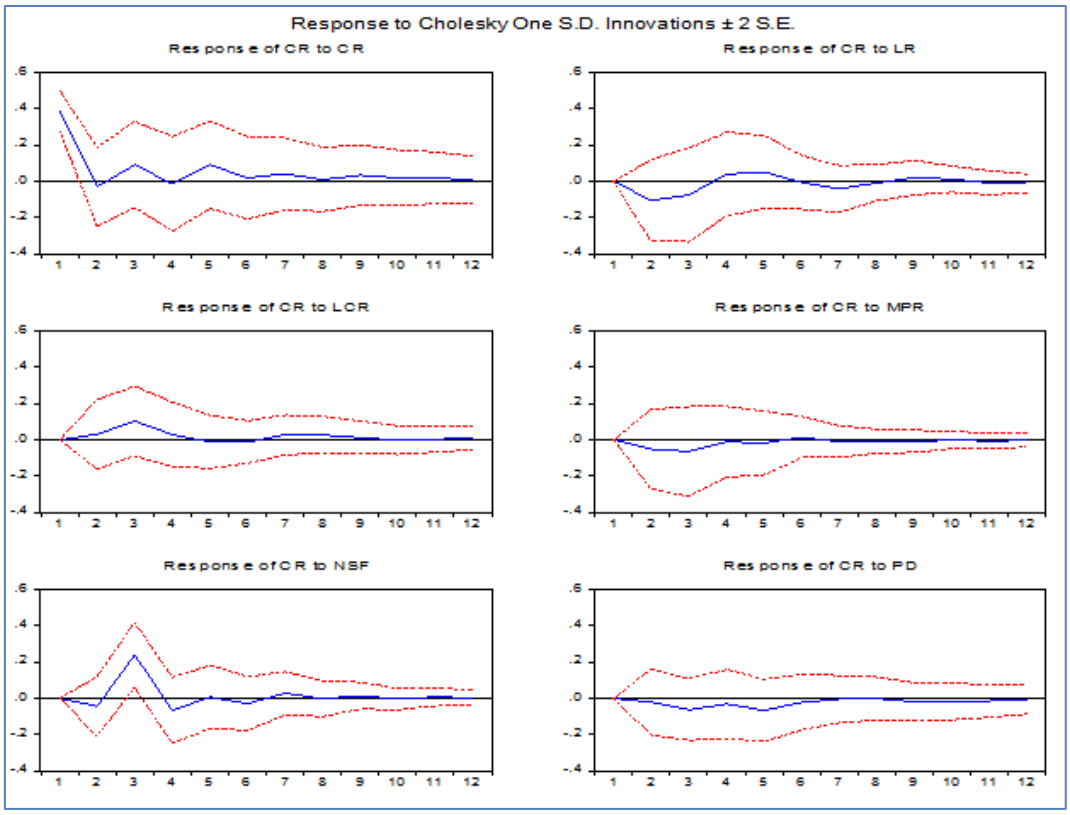

Fig-1: Response of Credit Risk to Basel Capital Reserves (Provisions)

The above impulse response of credit risk to Basel capital reserves was initially negative for leverage ratio (LR), minimum payout ratio (MPR) and Pledge Deposit (PD) during the first six months and later became insignificant till the end of the period.

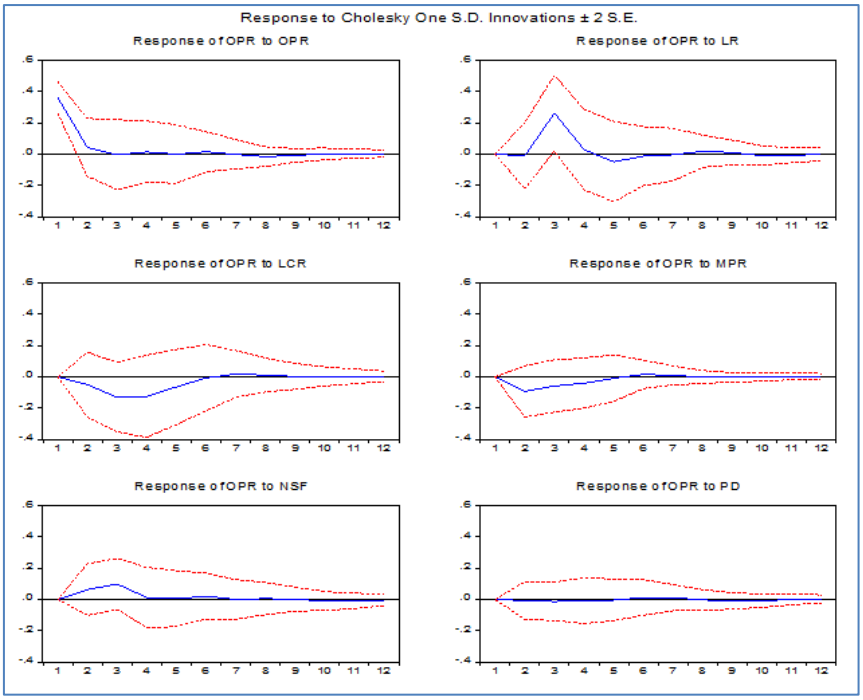

Fig-2: Response of Operational Risk to Basel Capital Reserves

Figure 4.6.7 illustrates the response of operational risk to shocks in selected Basel capital reserves. From the above, operational risk responded positively in the first three months to shocks in net stable funding ratio (NSF), LR but gradually dies out through the period under horizon. It was insignificant for shocks from PD.

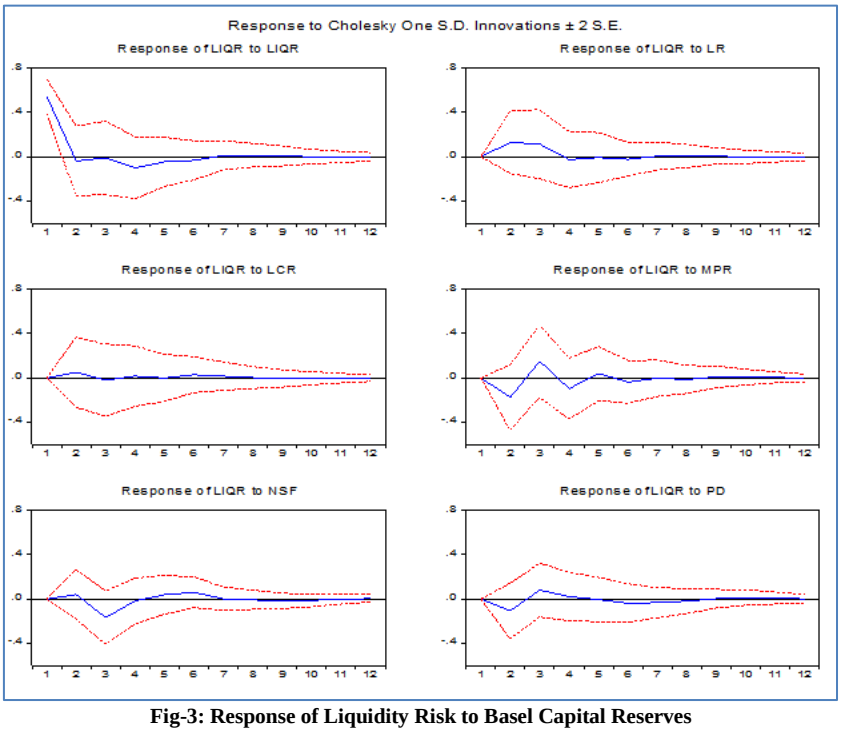

Fig-3: Response of Liquidity Risk to Basel Capital Reserves

The response of liquidity risk to the shocks of selected Basel capital reserves as shown in the above impulse response function indicates an insignificant response to Liquidity Conservation Ratio, initial decrease in Maximum Payout Ratio and Pledge Deposit at short run while for shock in Leverage Ratio, it recorded an in increase at the short run for the time horizon.

Response of Market Risk to Basel Capital Reserves

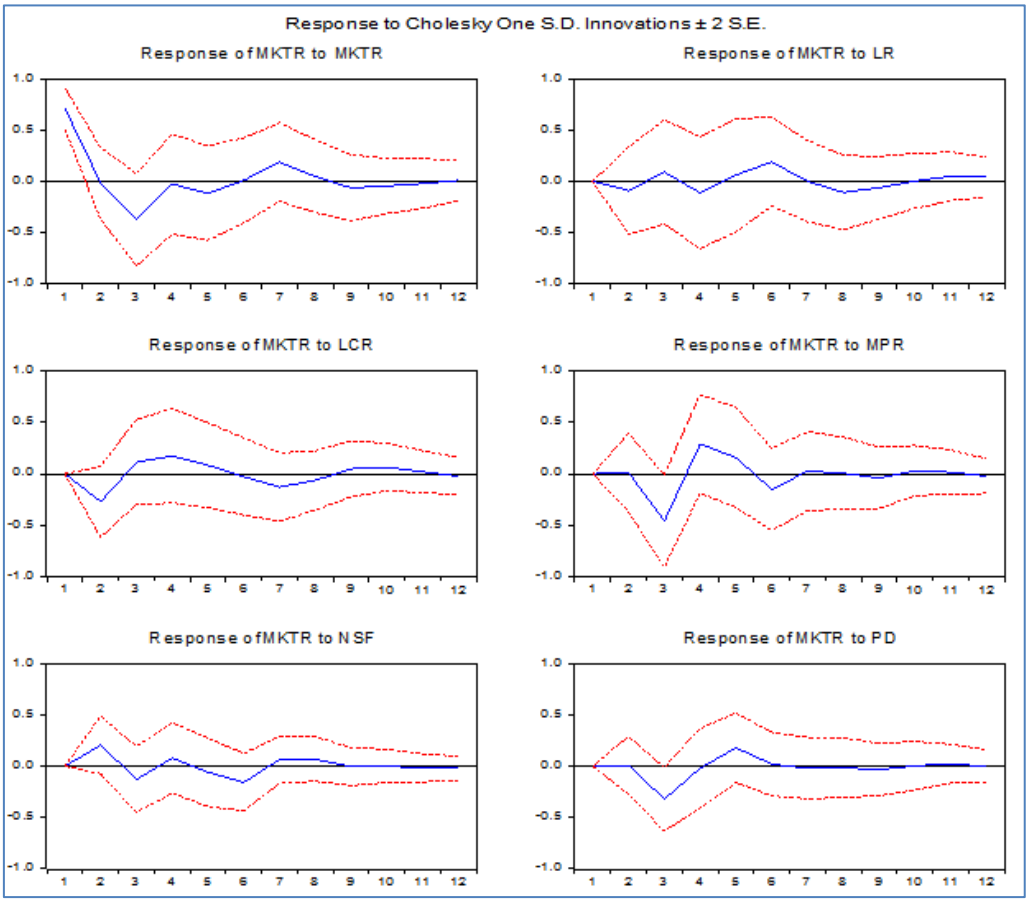

Fig-4: Response of Liquidity Risk to Basel Capital Reserves

The response of market risk to shocks in Maximum Payout Ratio decreased significantly in the three months, then experienced an increase in the next two months and later remained insignificant. It also recorded a slight de crease to the shocks in Leverage Ratio and Liquidity Coverage Ratio before normalising.

Variance Decomposition

Variance decomposition are presented in Table 4.7.1 to Table 4.7.12, on the effect of selected Basel capital measures following the different bank risk management practice specifications. Variance decomposition shows how much percentage of the total variance is explained by each component, thus the most effective component on the dependent variable. It is also used to determine direct and indirect effects between variables. The essence of the variance decomposition is to show the proportion of the forecast error variance of a variable that is attributable to its own innovations and other variables.

Table-1.5: Variance Decomposition of Credit Risk by Selected Basel Capital Reserves

Period	S.E.	CR	LR	LCR	MPR	NSF	PD
1	0.390612	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.413076	89.94132	6.565685	0.536579	1.574701	1.122374	0.259345
3	0.510341	62.13183	6.464922	4.463565	2.618919	22.63811	1.682652
4	0.518321	60.30605	6.862968	4.637030	2.582732	23.60240	2.008821
5	0.533468	59.87515	7.403972	4.421755	2.547571	22.29777	3.453777
6	0.535475	59.55841	7.363743	4.443079	2.600401	22.43439	3.599975
7	0.540202	59.11590	7.807560	4.626812	2.596814	22.30776	3.545152
8	0.541100	58.95590	7.805165	4.860428	2.608621	22.23562	3.534269
9	0.543218	58.87597	7.880052	4.871282	2.610601	22.13511	3.626986
10	0.544046	58.82185	7.907591	4.857368	2.604269	22.07475	3.734168
11	0.544717	58.80097	7.910807	4.850119	2.608963	22.03984	3.789301
12	0.544979	58.76435	7.939164	4.872206	2.610433	22.01955	3.794295
Cholesky Ordering: CR LR LCR MPR NSF PD							

The variance decomposition of credit risk by Basel capital reserves shows that after the first five months, credit risk maintained an average of 59% contribution to own shocks while Net Stable Fund Ratio contributed a mean of 22% after the first two months to the shocks in capital risk. Of all the selected Basel capital reserves, Maximum Payout Ratio had the least contribution.

Table-1.6: Variance Decomposition of Operational Risk by Selected Basel Capital Reserves

Period	S.E.	OPR	LR	LCR	MPR	NSF	PD
1	0.361881	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.384874	89.66727	0.057447	1.640670	5.844237	2.767912	0.022464
3	0.497868	53.58908	27.92225	7.902751	4.863245	5.650680	0.071991
4	0.515936	49.98431	26.32583	13.15265	5.125259	5.327335	0.084617
5	0.522283	48.77717	26.52867	14.37078	5.026422	5.210081	0.086876
6	0.523537	48.63090	26.45622	14.31459	5.096483	5.354671	0.147141
7	0.524109	48.52505	26.40264	14.41008	5.115842	5.343045	0.203343
8	0.524852	48.47712	26.45690	14.41866	5.101717	5.340688	0.204922
9	0.525119	48.44437	26.47196	14.40740	5.100938	5.337682	0.237645
10	0.525329	48.40604	26.47737	14.39799	5.097397	5.366858	0.254353
11	0.525476	48.38639	26.47891	14.39502	5.096746	5.388718	0.254218
12	0.525528	48.38128	26.47375	14.39475	5.097959	5.390832	0.261421
Cholesky Ordering: OPR LR LCR MPR NSF PD							

As can be seen from table 4.7.5 above, operational risk maintained an average of 48% of own shock from fifth month all through till the end of the season. By the end of the year, LR alone accounted for 26.47% of shock in operational risk while LCR contributed 14.39%, MPR 5.09%, NSF 5.39% and PD 0.26% respectively.

Table-1.7: Variance Decomposition of Liquidity Risk by Selected Basel Capital Reserves

Period	S.E.	LIQR	LR	LCR	MPR	NSF	PD
1	0.546281	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.602695	82.56246	4.706423	0.712090	8.452388	0.467605	3.099030
3	0.658913	69.09887	6.932070	0.688471	12.35132	6.798896	4.130371
4	0.674774	68.11880	6.749283	0.714624	13.81898	6.546620	4.051695
5	0.678618	67.79686	6.684658	0.706572	14.00227	6.799917	4.009724
6	0.685076	66.75087	6.661850	0.872400	14.02453	7.469422	4.220928
7	0.686146	66.57707	6.650137	0.921672	13.98197	7.447814	4.421332
8	0.686774	66.50341	6.644365	0.921789	14.00064	7.443479	4.486313
9	0.687188	66.43496	6.645253	0.926969	14.00632	7.502436	4.484062
10	0.687460	66.38245	6.640310	0.928745	14.00446	7.523365	4.520670
11	0.687558	66.36388	6.638762	0.929665	14.00521	7.521998	4.540488
12	0.687587	66.35946	6.638369	0.929890	14.00426	7.527426	4.540590
Cholesky Ordering: LIQR LR LCR MPR NSF PD							

As shown above, again liquidity risk accounts for 66.35% of its own shock in long run. LR maintained an average of 6% shock both in short and long run periods, LCR appeared insignificant while MPR also contributed a mean of 14% from mid-year through the end of the period, PD contributed an average of 4%.

Table-1.8: Variance Decomposition of Market Risk by Selected Basel Capital Reserves

Period	S.E.	MKTR	LR	LCR	MPR	NSF	PD
1	0.710888	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.794292	80.16013	1.272357	11.73288	0.021633	6.801130	0.011870
3	1.060081	57.51483	1.439616	7.763609	18.88276	5.257027	9.142157
4	1.121957	51.40912	2.290609	9.367255	23.54347	5.198893	8.190656
5	1.159449	49.13637	2.428439	9.284106	23.93405	5.128482	10.08855
6	1.195088	46.25489	4.777429	8.791246	24.13331	6.518628	9.524504
7	1.218817	46.82105	4.593235	9.590240	23.24801	6.568555	9.178913
8	1.228284	46.25358	5.302924	9.713014	22.89244	6.788374	9.049666
9	1.233555	46.12742	5.510034	9.778472	22.80925	6.731978	9.042841
10	1.236496	46.04363	5.484329	10.00829	22.76214	6.700260	9.001353
11	1.238267	45.94458	5.623151	10.00716	22.71185	6.698699	9.014558
12	1.239601	45.85104	5.729939	10.01906	22.69184	6.712890	8.995236
Cholesky Ordering: MKTR LR LCR MPR NSF PD							

Considering the variance decomposition of market risk to the selected Basel capital reserves in table 4.7.11 above, market risk accounted for an average of 46% of own shocks in the long run. Among the selected capital reserves, Leverage Ratio accounted for only 5.7%, Liquidity Conservation Ratio accounted for an average of 10%, Maximum Payout Ratio 22.67%, Net Stable Fund Ratio 6.7% and Pledge Deposit 8.9% respectively in the long run.

DISCUSSION OF FINDINGS

- The strong established long run equilibrium relationship that exist between CR, OPR, LIQR and MKTR with the selected Basel capital reserves indicators implies that Leverage Ratio, Liquidity Coverage Ratio, maximum Pay-out Ratio, Net Stable funding and Pledge Deposit have strong effects on risk management practices which in turn will have a long run implications on banks' safety, profitability, stability and survival.
- Basel III capital reserves as a global, voluntary regulatory framework on bank capital adequacy, stress testing and market liquidity if implemented will be a good omen for Nigerian banks.
- The long run equilibrium relationship between the selected Basel capital reserves and Bank risk management indicators implies that improve liquidity position according to Basel III requirements will cause weaker banks to be faced out of the market, the risk of bank run will be reduced. It is true banks with striker capital requirements and liquidity will result for banks shifting from short term to long term financing thereby decreasing the risk of bankruptcy in the banking system.
- The strong influence that net stable funding ratio and leverage ratio has on credit risk, operational risk, and market risk is an indication that bank having an enhance reserves funds we actually withstand stress time. This in turn will reduce the incidence of credit suspension (refusal to extent credit). This finding further suggests that higher CAR leads to less credit exposures.
- Liquidity risk (LIQR) and Market risk (MKTR) was found to response to shocks in the selected Basel III capital provisions positively and significantly more at the long run. This finding suggests that investment contribution by commercial banks were low, most investments of banks were tight to short time liquid assets and risk free government securities. This also implies that they were lending on short time basis which does not impact positively on the path of the Nigerian economic growth.
- Our finding reveals that capital buffers by banks will not only improve competition in the banking sector but is also capable of insulating financial crisis. It shows that the state of the economy is a major determinant of bank performance.
- The statistical and significant relationship between Basel capital provisions and risk management practices among commercial banks in Nigeria shows that the effects of higher capital standard on risk reduction varies among banks. Among all the risk management indicators, credit risk was found to be most critical followed by liquidity, market and then operational risk.
- Based on our findings risk is found to be an important causative factors that can trigger financial disaster in the banking sector and by extension the Nigeria economy. This therefore suggests that effective risk management according to prescribed international standard is desirous in the Nigeria banking scene.

CONCLUSION

Banks holding adequate capital to withstand shocks and meeting the expectations of its publics is a function of efficient and effective risk management. This is so because banking system failure is contagion and is capable of triggering financial crisis.

Experiences from other countries have shown that international best practices like Basel capital standards alongside domestic regulations aimed at enhancing bank liquidity is a critical bank management option that could leverage it against systemic risk.

Higher Basel capitals provisions (III) if implemented by bank management and regulators will effectively managed and mitigate risk in the banking system. These measures have been found to be effective in other countries. Adoption of higher capital standards in the Nigerian banking system was found to have both short and long run equilibrium relationship statistically and significantly. This therefore points to the fact that improved capital standards and regulation could ameliorate risk.

RECOMMENDATIONS

Based on the findings we recommend that;

- Risk management should be a matter of policy focus and priority among bank operators in Nigeria.
- There should be a striker measures to complement existing laws or existing laws be given the desire constitutional backings to prosecute credit defaulters. This is so because default rate is high and appeared the most critical to growth and survival of banks.
- Bank regulators in collaboration with the government should as a matter of urgency come out with directives to put structures in place to usher in Basel III (international best practices) that has being proven to improve bank risk management.

- Regulator should start early update of their capacity and sensitize bank operators through the Banker's committee forum toward the implementation of Basel III.
- Bank Internal and external audit systems as well improved corporate governance and adherence to industrial code of conduct and professionalism should be step up.

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