Over financial regulation and stability: Does it matters for bank efficiency in Nigeria?

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Abstract. Banks play a key and critical role in society, mediating resources and assets around the economy between surpluses and household spending on deficits. Therefore, they have a great responsibility for sustainability and prosperity. This study is motivated by the need to investigate whether competition, regulation and stability are important for the efficiency of the Nigerian banking system. Data sourced from the World Development Indicators between 1996 and 2017 was used. The results show a negative and statistically significant relationship exists between financial regulation and efficiency of the banking sector. However, further results show a positive and statistically significant relationship exists between financial regulation and stability in the system. Thus, the study concludes by emphasizing the importance of stability and bank performance matters in Nigeria.
Keywords. Bank efficiency, Financial regulation, Stability.
JEL. D81, D91, E71, G01, G41, H11, I18, Z18.

1. Introduction

T he financial crisis that ravaged the world in 2007 and 2008 led to a wave of re-regulation and further regulatory debate that resulted in the Banking regulation measures to avert financial crises and liquidity traps (Cao *et al.,* 2020; Hassan *et al.,* 2020; Doan *et al.,* 2018). This article reviews the main debate surrounding regulations with a special focus on the Nigerian Financial System. The main objective of this study is to investigate whether or not over regulation existing practice is over regulaled. In addition, this review aims to uncover new information that could help to improve effective and efficient supervision without exposing the sector to external shocks due to over regulation.

Further more, this issue of the reviewincludes articles on regulation of the Central Bank of Nigeria (CBN) and structural change in financial markets, looking back at the experience of Nigeria banking crises and also suggesting possible improvements to regulation and oversight. The review addresses the overall structure of regulation and thecrucial role that enhanced liquidity regulation will play.

The remainder of this paper is organised as follows. Section 2 presents the background of the study and problem of regulation in the Nigerian Banking System and section 3 present the concept and theoretical flaws that call for, regulation. Section 4 present the trend analysis of the major

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indicators of regulation with respect to the Nigerian Financial System. Section 4 conclude with policy suggestions.

2. Background

The global financial crisis between 2008 and 2010, experienced through cross national banking structures across countries, affected the global economy and has contributed to unforeseen implications. Some studies note that globalisation and excessive competition in financial sectors are important factors driving the financial crisis (Teichmann & Falker, 2020). Consequently, the effect of bank regulation and competition on financial stability has since drawn more attention from academics and policy makers.

Before the transition period, banking sectors were largely state-controlled, and lending practices showed a marked bias toward state-owned companies, which are basically the only source of non-monetary budget deficit financing. Because of the government's implicit guarantee, banks were not motivated to control their risk. Consequently, they were saddled with a large number of bad loans concentrated in the public banking sector.
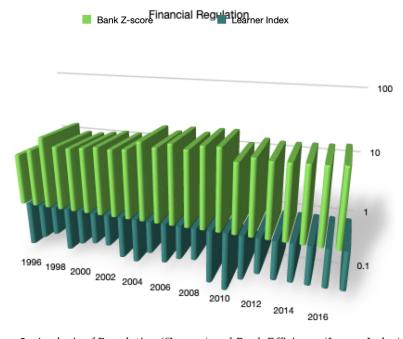

Figure 2. *Analysis of Regulation (Z-score) and Bank Efficiency (Lerner Index)*
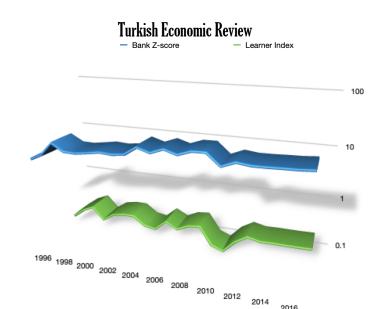
Figure 2. *Trend Analysis of Regulation (Z-score) and Bank Efficiency (Lerner Index)*

Figure 1 and 2 depicts the analysis of regulations and bank efficiency. As observed from the trend analysis, it is clear that financial regulation and bank efficiency move in the same direction. Between 1996 and 1998, there was a slow and decrease in the pattern of both variables, while irregular movement was observed between 2000-2012. The flat shape pattern was observed between 2013 -2017. Overall, financial regulation and bank efficiency in Nigeria appears to be connected.

Since the 1990s financial reforms have been introduced across transition countries, including the settlement of non-performing loans (LPNs), the privatization of state-owned banks, the incorporation of foreign investors and the restructuring of national bank structures. However, the financial system has always been procyclical, with easy availability of credit boosting growth in the upturn and with credit crunches often aggravating the downturn, and this feature was present notably in the subprime crisis. One underlying factor is that provisions are based on immediate risk of loss, so cushions are not built up in advance of recessions. There are three functions of regulation, the protection of the direct interest of the consumer through product regulation, the protection of the consumer against monopoly power through structural regulation and the indirect protection of the consumer through regulations designed to reduce spillover and contagion from damaging events such as bank failure. The first two functions may be described as micro prudential and the latter function as macro prudential. Bank regulation also has a number of layers of responsibility as well, with the overall framework being set by the central banks.

3. The problem

The advent of the new financial instruments and the search for a global financial system have led to a significant expansion of speculative activities, thereby making gambling an important feature of financial activities. This

has been a source of instability in many nations and has weakened the whole international economic system.

There are fives shortcomings of this search for financial liberalization and the advent of new financial instrument are below. First, financial market operation are flawed in that many successful operations are largely derived from group behaviour. Second, the prices in stock and capital markets often overshoot, which creates the potential for bubbles. Third, the emergence of a largely unregulated shadow financial system and the growth of financial institutions of systemic significance have generated systemic risk within financial markets in the sense that one institution's failure could cause a global financial crisis (Allen & Gu, 2018). Fourth, banks levy many other charges, such as fees for a check book or an ATM card. More than 20 percent of banks report other types of account-opening charges. Bank charges on maintenance fees also reduce the number of bank account. Fifth, charges for remittances are another form of cost that reduces bank usage. The higher the fee charged for receiving a foreign draft, the lower the number of accounts per thousand adults.

Given the trend towards growing regulatory risk for financial institutions, it is topical to shed light on the justification for financial regulation, with the focus on separating expectations from facts. In reality, today's highly competitive and dynamic financial markets will undoubtedly need a robust regulatory structure to rectify market imperfections, with blurred boundaries. Accordingly, this article will address the core elements of the financial regulation argument along with the myths and truths about modern financial regulation. In Nigeria Banking System, large-scalemalpractices, lack of transparency and accountability have become so bad that every bank has become an institution from which the economy is sapped and maimed. The situation becomes worrisome as politicians and historians are major functionaries in our banking institutions, simply because of the lack of professionalism in the Nigeria banking system.

4. Literature review

4.1. Theoretical framework

In the extant literature, financial regulation can be theorised in two ways. The first characterzes contends that financial regulation or panic are undesirable random event that often have resultant effects on the real economy variables (Allen *et al.,* 2009; 2017). For example, panics are incidents of self-fulfilment. Agents have unpredictable consumption requirements, and it is expensive to liquidate long-term investments. The second theory suggests that banking stability is not random events, but natural condition attached to business cycle trends (Friedman & Schwartz, 1962; Gorton, 1988). The theory is that an economic downturn will decrease the valuation of bank assets, increasing the risk that banks will not be able to fulfill their obligations. Allen & Gu (2018) identify six consequences of systemic risks attached to micro prudential regulation which includes: (1)

panic banking crises; (2) banking crises which reduce asset value; (3) contagion; (4) financial planning; (5) foreign exchange distortion or exogenous shocks; (6) banking effect from uncertainty. Stein (2012) developed and identified various methods of financial stability which include fundamental market failure, and conventional market and open market externalities.

4.2. Empirical review

Several studies have examined the linked between financial regulation and stability with mixed evidence. For example, Sun (2020) measures the financial strength of the People Bank of China from the perspective of balance sheet and then examined whether financial strength affects it policy using econometric approach. The author results shows that resilient balance sheet is necessary for maintaining the financial strength in Chinese economy. Okahara (2018) proposes and develop a model for interaction between banks and creditors and reports that financial regulation requires bank disclosure of information about its capital structure which can hel stabilise the system. Baek (2017) recognised that financial intermediaries can disclose costly information about the value of their assets and that creditors depends on this information to form their expectations. Avgouleas & Xu (2017) highlighted five cardinal issues pertaining to financial regulation which includes; (a) bad lending system; (b) lax governance; (c) shadow banking system; (d) short term liquidity backstops; (e) lack of transparency. Admati *et al.* (2012) suggests that debt overhang and capital regulation are important factor in ensuring stability.

Some studies suggest that although participating in non-lending activities helps banks diversify risk, lack of experience in new services can often lead to higher income volatility and greater instability. Strict capital standards can help enhance corporate governance for banks and mitigate risk-taking behaviour, although they are not generally correlated with lower loan losses (Li, 2019, Luo *et al.,* 2016; Fries & Taci, 2005). Evidence has shown that greater supervisory control often contributes to more corruption in lending, and that this increases bank instability (Grigorian, & Manole, 2005; Barrell *et al.,* 2010; Barrell & Davis, 2005).

Earlier studies have shown a fragility of competitive banking systems. In a competitive banking environment, banks benefit less from the lending relationship, which discourages them from properly controlling the risk of borrowers and thus increases the risk (Djalilov & Piesse, 2016). It also implies that large banks in concentrated banking sectors will raise profitability and reduce financial uncertainty by having more "capital buffers" to withstand external macroeconomic and liquidity shocks (Battisti *et al.,* 2020).

Moreover, as regards the nexus of competition – fragility, while deposit insurance can alleviate bank volatility by preventing banks from insolvency, it also contributes to moral hazard by offering incentives for banks to participate in risk-taking activities. So, deposit insurance in a more

competitive market will increase bank instability (Acharya & Matthew, 2010; Arch, 2020), and to prevent excessive risk taking in a competitive banking system, restrictions on deposit interest rates are important, which call for regulation (Agarwada, 2005; Adrian & Hyun, 2008). Some studies show that bank risks do not increase by using alternative methods of allocating risk exposure, even though market force promotes riskier portfolios of assets (Ahearne *et al.,* 2002; Agbetsiafa, 2005; Ahuja *et al.,* 2010).

Previous studies have shown mixed results regarding the effect of the banking sector reform on risk-taking behaviour. From the conventional point of view, financial liberalisation is commonly correlated with increased market competition, which in turn promotes increased risk-taking and increased moral hazard problems (Ahrend *et al.,* 2008; Agbetsiafa, 2011). Other scholars, however, have varying opinions, suggesting that banks are more likely to pursue economies of scale and reach and diversify income flows, thereby incurringless risky if liberalised (Akyuz, 2009).

4.3. Hypothesis formulation
In light of the above, the research questions this study seeks to address the following research question:

Does Over financial regulation causes bank efficiency?

The answer to this question will provide explanation for the ongoing debate around the potential impacts of financial over regulation on the system.

5. Methodology
5.1. Empirical model
Following Luo *et al*. (2016), the estimated model connecting the financial regulation and bank efficiency is specified as:

$$Fin - reg = f(Lerne - index)$$

Where, $Fin - reg = Financial\ regulation\ and\ Lerne - index = Lerner\ Index\ (Bank\ efficiency)$

To control for other variables such as stability, capital market impact, economic impact. Thus, the model becomes:

$$Fin - reg = f(Lerne - index, Inf, Market\ cap, Int - spread)\quad (2)$$
$$Inf = Inflation\ (Stability)$$
$$Market\ cap = Market\ capitalisati\ (capital\ market\ imapct)$$
$$Int - spread$$
$$= Interest\ rate\ spread\ (Economic\ impact\ on\ consumer\ and\ investors)$$

Where:

The bank regulation is measured by $Z - score$, which is specified below as:

$$Z_{Scores\ i,t} = \overline{ROA}_{i,t} - (E/A)_{i,t} \Big/ sd\ (\overline{ROA})_{i,t}$$

where bank risk$_{ijt}$indicates bank i's stability in year t and is measured as the logarithm of the Z-score (log Zscore); $\overline{ROA}$ = moving average of return on asset; $(E/A)_{i,t}$ = ratio of equity to total asset; $sd\ (\overline{ROA})_{i,t}$= standard deviation of return on assets.

Competition is measure by Learner Index expressed as:

$$Learner\ Index = P_{i,t} - MC_{i,t} \Big/ P_{i,t}$$

Where; $P_{i,t}$ = indicates the output price (measure as total asset ratio for banks); $MC_{i,t}$ = is the marginal cost of banks.

5.2. Econometric model

The Model in equation 2 is respecified as:

$$Fin - reg_t = \alpha_0 + \alpha_1 Lerne - index_t + \alpha_2 Inf_t + \alpha_3 Market\ cap_t + \alpha_4 Int - spread_t + e_t \quad (3)$$

Where, the parameter is denoted as α_0 *is the constant and* α_{1-4} *is the intercept.* The e_t is the error term.

5.3. Data, sources and description

The study used the annual data sourced from the Federal Reserve Bank of St. Louis and World Development Indicator. The period consider is between 1996 and 2017 and it was based on the available data for specific key indicators such as the Z-score which capture financial regulation and Lerner index which measure bank efficiency.

Table 1. *Variables, sources and definitions*

Variable	Sources	Definition
Financial regulation (Z -Scores)	*FRED, Federal Reserve Bank of St. Louis*	It captures the probability of default of a country's banking system, calculated as a weighted average of the z-scores of a country's individual banks (the weights are based on the individual banks' total assets). Z-score compares a bank's buffers (capitalization and returns) with the volatility of those returns. It captures the probability of default of a country's banking system, calculated as a weighted average of the z-scores of a

		country's individual banks (the weights are based on the individual banks' total assets). Z-score compares a bank's buffers (capitalization and returns) with the volatility of those returns. It is estimated as (ROA+(equity/assets))/sd (ROA); sd(ROA) is the standard deviation of ROA. (Calculated from underlying bank-by-bank unconsolidated data from Bank scope).
Bank Efficiency (Lerner Index)	*FRED, Federal Reserve Bank of St. Louis*	A measure of market power in the banking market. It compares output pricing and marginal costs (that is, mark-up). An increase in the Lerner index indicates a deterioration of the competitive conduct of financial intermediaries. A measure of market power in the banking market. It is defined as the difference between output prices and marginal costs (relative to prices). Prices are calculated as total bank revenue over assets, whereas marginal costs are obtained from an estimated trans log cost function with respect to output. Higher values of the Lerner index indicate less bank competition. Lerner Index estimations follow the methodology described in Demirgüç-Kunt and Martínez Pería (2010).
Stability (Inflation)	*World Development Indicators (WDI).*	Inflation as measured by the consumer price index. It reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or change at specified interval, such as year.
Market Capitalisation	*World Development Indicators (WDI).*	Market capitalisation (also known as market value) is the price times the number of shares outstanding (including several classes) for listed domestic companies. It a measure of stock market size and can measure the well-functioning of financial market.
Interest rate spread	*World Development Indicators (WDI).*	The interest rate spread is the interest rate charged by banks on loan to private sector customers minus the interest rate paid by commercial similar banks for demand, time, or saving deposits. The terms and conditions attached to these rates differ by country.

Notes: FRED: Federal Reserve Bank of St. Louis & WDI: World Development Indicators

6. Empirical results

This section presents the empirical discussion of the estimated regression model and discussed the findings.

6.1. Preliminary checks

This section presents the preliminary checks which includes the descriptive statistics and correlation matrix. The aim is to explore the behaviour and relationship of the dataset before analysis is carried out.

6.1.1. Descriptive statistics

Descriptive statistics and correlations for the main variables are in Table 2 and 3.

Table 2. *Descriptive Statistics*

Variable	Min	Max	Mean	Std. Dev.	Obs.
Fin-reg	7.08	20.0	14.5	3.3	22
Lerne-index	0.1	0.33	0.23	0.05	22
Inf	21.7	52	26.8	7.8	22
Market cap	2.4	30.8	12.3	5.12	22
Int-spread	2.3	15.5	6.9	3.02	22

Source: *STATA 12 Output*

Table 2 shows the summary of the descriptive statistics which includes the arithmetic mean and standard deviation. On average, the financial regulation and its corresponding standard deviation is reported as 14.5 (3.3), followed by Lerner Index (*Lerne-index)*, Inflation (*Inf*), Market capitalisation (*Market cap*), and interest spreads (*Int-spread) which are reported as: 0.23 (0.05), 26.8 (7.8), 12.3 (5.12), and 6.9 (3.02).*

Table 3. *Correlation Matrix*

Variables	Fin-reg	Lerne-index	Inf	Market cap	Int-spread
Fin-reg	1				
Lerne-index	-0.1	1			
Inf	0.4	-0.02	1		
Market cap	0.08	0.06	-0.12	1	
Int-spread	0.6	-0.4	0.02	0.28	1

Source: *STATA 12 Output.*

Table 3 shows the correlation matrix of the variables. The results show that negative relationship exist between Financial regulation and Lerner Index (*Lerne-index)*, while other variables have positive relations with financial regulations.

6.2. Main results

This section presented the results of the estimated regression model on the relationship between financial regulation, bank efficiency, stability and other economic impacts. The details are summarised in Table 4.

Table 4. *Estimated Regression Model*

Independent Variables	Dependent Variable: Bank Regulation (Fin reg)		
	Model 1	Model 2	Model 3
Lerner-index	-1.53**	-1.8**	-1.88**
	(-1.92)	(-2.0)	(-2.06)
Inf	0.02***	0.03***	0.29***
	(2.2)	(3.26)	(2.24)
Market cap		0.82***	0.79***
		(4.37)	(5.71)
Int-spread			0.06**
			(2.34)
C	11.3***	12.6**	12.9**
	(13.2)	(14.23)	(15.3)
Time (dummy) Inclusion	Yes	Yes	Yes
R-squared			0.63
Adj.-R squared			0.55
F-stat.			0.000

Notes. T-statistic is reported in paratheses. *** Significance at 1% (two-sided) level.; ** Significance at 5% (two-sided) level. * Significance at 10% (two-sided) level.

The results in Table 4 are presented in three folds. Frist, the Model 1 shows the estimated results on the effect of bank efficiency, stability on financial regulation. From the results, bank efficiency has a negative relation with financial regulation, while positive effect was found between stability (inf) and financial regulation (Fin reg) and they are all statistically significant. Second, Model 2 check the effect of market capitalisation (Market cap) on financial regulation (Fin reg). the results show that market capitalisation has positive and statistically significant relations with financial regulation (Fin reg). Third, Model 3 consider the economic impact of regulation using the interest spread as indicator. The results show that positive relations exist between interest spread and financial regulation. The overall Adj.-R-squared is valued at 0.55, which implies that about 55% variation in the dependent variables is explained by the model. The F-statistic of 0.000 shows that all the variables included are determinant of financial regulation.

7. Conclusion remarks

Financial regulation refers to the rules and laws firms operating in the financial industry, such as banks, credit unions, insurance companies, financial brokers and asset managers must follow. However financial regulation is more than just having rules in place – it's also about the ongoing oversight and enforcement of these rules.

The review shows that increasingly strict banking regulations are changing how financial institutions of all shapes and sizes conduct business. Similarly, the review shows that operation controls, capital regulation, official supervisory behaviour, private supervision and greater disclosure of financial statements are associated with higher bank stability provide empirical evidence that an effective banking regulatory system is critical to maintaining bank stability.

As far as banking regulations are concerned, both higher operation limits and more specific asset diversification guidelines improve bank stability, but this positive impact substantially weakens for banks with higher market power. In conjunction with greater market strength, more stringent capital requirements raise the risk of bank insolvency.

Thus, tighter regulation is meant to boost performance, but one unintended result is that talented investment bankers are disincentivised. Some now gravitate towards smaller, lighter-regulated finance houses and private equity and investment funds. In addition, extraterritorial financial regulation is becoming more compelling, which reinforces the case for capital requirement for banks and legislation greater transparency.

A number of further avenues for research relevant to the subject can be envisaged. To begin with, the study approaches central bank regulation from a legal perspective, and one of the key legal provisions concerns the organisational structure in which a central bank sit. A second avenue for further research is that the essential relationship between central bank regulation and financial stability requires more comprehensive interdisciplinary study, beyond the rule-based framework employed here. However, there are still only a few studies explored this topic from a legal perspective.

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