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The Incentive Effect of Regulatory Capitals Requirement: Empirical Evidence from Nigeria

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Abstract

The divergence of opinion between policy makers and academic researchers, as to which of the first two capital requirements (Tier 1 and 2 capitals)exerts more influence on the attitude of banks towards risk, has led to an unending debate. Policy maker's opinethat Tier 2 capital does not satisfy the purpose with which it was introduced as compared to Tier 1capital. They are of the view that Tier 2 capital is inferior to Tier 1, both in terms of 'going-concern' and 'gone-concern'. This group suggests that Tier 2 should in its entirety be scrapped. The academic literature, on the other hand, highlights the benefits of Tier 2 to include a device of market discipline and a signal of banks creditworthiness, thus strongly advocatesits enforcement. This study contributes to this debate by examining empirically, the relationship between these two regulatory capital requirement and banks behaviour in Nigeria. The study applies Autoregressive Distributed Lag Approach otherwise known as "Bound Testing Approach" to determine both short and long-run relationships among regulatory capitals and variables surrogating risk taking behaviour of banks. The result demonstrates the critical position of Tier 1 capital in key decision making process, in relation to credit creation and loan loss provisioning. Without assigning any role to Tier 2 capital, the result further suggests that, besides Tier 1 capital, monetary policy rate plays a striking role in the determination of loan growth. This, therefore, support the submission that Tier 1 is superior to Tier 2 at-least in terms of going-concern.

JEL Classification Numbers: G21, G28, G38, M21

Keywords: Regulatory capital, ARDL, risk, loan growth rate

1. Introduction

The capital adequacy ratio was introduced in 1988 by the Basel Committee on Banking Supervision (BCBS) as a benchmark to evaluate whether banks have capital sufficient enough to survive likely economic shocks. It tends to provide among others, a cushion against losses due to default arising from both on-and-off balance sheet exposures, shows the willingness of banks stakeholders to put their own funds at risk, make resources available free of transaction and liquidation costs, create room for healthy expansion and business finance, as well as discourage risky lending. The initial Basel capital adequacy ratio (CAR), coupled with its subsequent modifications require banks to have capital not less than 8.0 percent of risk-weighted assets (RWA). Both the numerator (capital) and the denominator (risk-weighted assets) of this ratio have anintricate definition and derivable from the financial statementsand balance sheets of deposit money banks (DMBs). The numerator consistsof: Tier 1 capital minus goodwill, Tier 2 capital and Tier 3 capital minus adjustments. Risk-Weighted Assets (RWA) is the weighted total of each class of assets and off-balance sheet exposures. The weights are in consonance with the risk associated with each type of asset.

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There is, however, a divergence of opinion between policy makers and academic researchers as to which of the first two capital requirements[4] is more related to the positive attitude of banks towards risk. While most policy makers are of the view that Tier 2 capital does not satisfy the purpose with which it was introduced, hence inferior to Tier 1 and should be scrapped, the academic literature highlights the benefits of Tier 2 capital to include a device of market discipline and a sign of banks creditworthiness and should be enforced. This study is an attempt to estimate empirically the relationships between these two regulatory capitals[5]and banks attitude towards risk in Nigeria.

The study adopts an Autoregressive Distributed Lag Approach (ARDL) otherwise known as "Bound Testing Approach" (BTA) to co integration to determine both the short and long-run relationship among the variables representing risk taking decisions of banks and their determinants.To achieve this, the paper is structured into five sections.After this brief introduction, section two provides the contextual framework and reviews some relevant literature. Section three, explains the methodology, data sources and estimation procedure while section four presents and analyses the results and the last section concludes.

2. Contextual Framework and Relevant Literature

Contextual Framework

Based on BCBS benchmark, restrictions on bank capital are three fold, namely: Tier 1 capital, Tier 2 capital and risk-weighted assets[6]. IfTier 1 capital[7]is represented as P_c, Tier 2 as

S_c and risk-weighted assets as RWA. Following strictly the approach by Chami and Cosimano (2003), constraints to $P_c$can be represented mathematically as:

$$\beta_1 RWA \leq P_c \qquad (1)$$
$$\beta_1 = 0.04(RWA)$$

Total capital constraint is given as;

$$\beta_2 \leq P_c + S_c \qquad (2)$$
$$\beta_2 \geq 0.08(RWA)$$

Also,P_c must not exceed S_c;

$$0 < S_c \leq P_c \qquad (3)$$

Following Basel capital accordthe ratio of P_c to S_c is;

$$2 * \beta_1 \geq \beta_2 \qquad (4)$$

In addition to the possible losses arising from impaired credit, banks strive to make profit (Π) from the returns on their assets subject to the constraints listed above. Encapsulating the composition of capital and assuming that return on loan is the only source of income to banks, thenbanks' profits can be presented as follows.

$$\Pi = \pi_c C - \pi_d D - \pi_{sd} SD - \omega \text{IC} \qquad (5)$$
$$where\ \pi_c C > \pi_d D + \pi_{sd} S + \omega \text{IC}$$

Π is profit; π_c is return on credits *(C)*; π_d is price of deposits *(D)*, π_{sd} is the cost of some components of Tier 2 capital, for instance subordinated debt (SD), which in this case implies S_c and the quantum of impaired credit is represented by$\omega<1$.

[4] Tier 1 and Tier 2 capitals
[5] Only Tier 1 and Tier 2 capitals are operational in Nigeria
[6] Emphasis is on Tier 1 and Tier 2 only, since Tier 3 is not yet operational in Nigeria
[7] Tier 1 and Tier 2 capitals are referred to as primary and secondary capitals, respectively in Nigeria,hence the notations Pc and Sc, respectively.

If the financing cost of debt is expressed as a proportion (α) of the cost of financing equity (λ). π_c consists of the risk free rate (π_{tf}) and the anticipated portion of impaired credit(e(ic)). Thus,

$$\pi_c = \pi_{tf} + e(ic) \quad (6)$$

Now, bringing equations (2) and (3) together yields:

$$S_c = (\beta_1 - \beta_2)RWA \quad (7)$$

$$\frac{\delta\beta_1}{\delta P_{c_1}} - \frac{1}{RWA} \quad (8)$$

Given that a proportion *(β_2)* of credit*(C)*must be covered by capital*(K)*, *C*= $\frac{K}{\beta_2}$, hence

$$C = \frac{P_c + S_c}{\beta_2} \quad (9)$$

Since there are only two sources of financing credit - deposits or capital:

$$D = (1 - \beta_2)C \quad (10)$$

Equation (5) - the profit equation - can now be re-written as

$$\Pi = -\left(\frac{P_c + S_c}{\beta_2}\right)\left[\pi_{tf} + e(ic) - \pi_d(1 - \beta_2) - \alpha\lambda(\beta_2 - \beta_1) - \omega\right] \quad (11)$$

Any change in the composition of capital, following to Chami and Cosimano(2003) would have the following effect on banks' profit:

$$\frac{\delta\Pi}{\delta\beta_2} = -\left(\frac{P_c + S_c}{\beta_2^2}\right)\left[\pi_{tf} + e(ic) - \pi_d(1 - \beta_2) - \alpha\lambda(\beta_2 - \beta_1) - \omega\right] + (\pi_d - \alpha\lambda) \quad (12)$$

With$\alpha\lambda > \pi_d$ and $\frac{\delta\Pi}{\delta\beta_2} < 0$, it follows that there is an inverse relationship between capital ratio and profit such that any increase in regulatory capital ratio will lead to reduction in profits and vice versa.

Given that $\Pi = xy$; such that

$$x = \left(\frac{P_c + S_c}{\beta_2}\right)$$

$$y = \left[\pi_{tf} + e(ic) - \pi_d(1 - \beta_2) - \alpha\lambda(\beta_2 - \beta_1) - \omega\right]$$

Then change in the composition of capital will, therefore,take the following pattern;

$$\frac{\delta xy}{\delta P_c} = y\frac{\delta x}{\delta P_c} + x\frac{\delta y}{\delta P_c}$$

Given that $K = P_c + S_c$ and assuming a given level of capital. A proportionately inverse adjustment is, therefore, required between P_c and $S_c$to maintain the same level of K. Hence,$\frac{\delta P_c}{\delta S_c} = -1$.

Then,

$$\frac{\delta xy}{\delta P_c} = \frac{\frac{\delta(P_c + S_c)}{\beta_2}}{\delta P_c} = \frac{1}{\beta_2} + \frac{\delta P_c}{\delta S_c}\frac{1}{\beta_2} = 0$$

$$\frac{\delta xy}{\delta P_c} = x\frac{\delta y}{\delta P_c} = \left(\frac{P_c + S_c}{\beta_2^2}\right)\alpha\lambda\frac{\delta\beta_1}{\delta P_c}$$

$$\text{Since } \beta_1 = \frac{P_c}{RWA} \Rightarrow \frac{\delta\beta_1}{\delta P_c} = \frac{1}{RWA} = \frac{\beta_2}{P_c + S_c}$$

$$\frac{\delta xy}{\delta P_c} = \frac{\delta\Pi}{\delta P_c} = \alpha\lambda \quad (13)$$

From equation 13, P_c and Π are directly related by αλ such that any one unit increase in P_c for instance, induces a αλ increase in Π. Now, since P_c earns λ, it follows thatany increase in the proportion of P_c

undoubtedlyleads to reduction inΠ. On the other hand, any adjustment in S_c by way of increase will impact positively on $\Pi$by $(1-\alpha)\lambda$ as well as increases in the λ and π_{sd} since market recognised the risk in increased leverage[8].

Relevant Literature

To avert the risk of bank failure, regulators require banks to provide capital above their own preferences so as to be able to absorb losses in case of decline in their net-worth. The Basel Committee set the benchmark for the regulatory capital. The Basel accords[9] allow banks to hold three types of capital in line with some established norms, namely: Tier 1, Tier 2 and Tier 3 capitals. Tier 1 which is a high quality capital and otherwise known as 'core capital' consists of equities and disclosed reserves that are readily available to meet claims against banks, while Tier 2 which is a relatively lower capital consists of long term instruments and undisclosed reserves that are readily available to absorb losses, but not necessarily permanent and can be lay-off at a discount or cost. It is considered lower capital as it has uncertain values and does not possess full loss-absorption capacity of Tier 1 capital items. The main constraints, as seen in section 2.1, are that total regulatory capital must not be less than 8.0 percent of RWA and Tier 2 should not exceed Tier 1 capital. Tier 3 capital is yet to be operational in Nigeria.

While Tier 1 is expected to be freely and immediately available to meet claims against banks, Tier 2, akin to deposits, is expected to provide additional benefits of market discipline. For instance, the subordinated debt holders are expected to be privy to enough unsolicited but qualitative information that will guide them in yield setting and monitoring of banks risks. Both the regulator and the bond holders have the incentives of aligning their interest and thus reduce the risk of banks failure.

There are, however, divergent strand of both theoretical and empirical literature on the behaviour of banks vis-à-vis these capitals. some are of the view that Tier 2 capital is inferior to Tier 1, both in terms of incentives for an on-going bank (going concern) and regarding the protection it offers in the case of failure (gone concern). This group suggests that Tier 2 should in its entirety be abolished (Barrel et al, 2011). Others are of the view that since emphasis is gradually shifting to using the private sector to monitor banks risk taking behaviour, the owners of Tier 2 capital are the most disciplined in the financial market, as it is the most relevant measure for depositors, counter parties and other shareholders of banks' debt.

First known in the strand of literature that focuses on the opacity of banks activity that generates asymmetric information between depositors and banks is Morgan (1998). He noted that banks operate with low level of fixed assets compared to other firms, yet issue more financial claims which require screening and monitoring. According to him, the advantage of banks lies in their scale economies of monitoring, which makes it necessary for depositors to join the monitoring community. The depositors have unflinching access to unfettered information that is embedded in their repeated transactions with the banks. In the same vein, Peria and Schmukler (1999) observes that market is an anonymous force that cannot in anyway be lobbied for leniency, hence Tier 2 stakeholders have the capability of reacting faster than the regulators.

The US Shadow Financial Regulatory Committee (2001) submitted that issuance of subordinated debt, which is a component of Tier 2 capital, would expose risky banks to market discipline of two types: one, it promotes direct market discipline, because, as banks risk increases, they face higher yields arising from refinancing. Two, indirect discipline further occurs when regulators use information accrued from higher yields, arising from increase in risk, to take proactive policy decisions to prevent crisis. Information contain in higher yields may be superior to those available to the regulators through bank examinations. This is, because, market is relatively more equipped to evaluate complex situations than the regulators. Moreover, risk is priced by the market on a continuous basis unlike the regulators that do only discretely. While regulators examined banks occasionally, market does daily. This position is also corroborated by Bliss (2001).

[8]See Chami and Cosimano (2003) for more detail.
[9]Basel I, II and II

Maechler and MacDill (2003) used a quantity approach to examine the applicability of market discipline hypothesis in the USA. They found evidence in favour of the view that depositors serve as a discipline device to badly behaved banks, as movements in uninsured deposits was directly related to some banks fundamentals during the studied period. Acharya and Yorulmaezer (2005) argue against relying only on the activities of the regulatory authorities to monitor and discipline banks due to "time-inconsistency problem" (TIP), hence fervently advocate the complementary effort of market agents.

On the other hand, the first set of views that dwell on the weaknesses of Tier 2 capital can be found in corporate governance literature. Here, attention is focused on government intervention that is capable of rendering the instrument a less useful tool of disciplinarydevice against banks. Billet et al (1998) found no evidence in support of Tier 2 as a market disciplining device for the US. According to them, the level of uninsured deposits of banks downgraded by Moody"s in the US during the study period was even at increase despite the downgrade. They submitted that banks rely more on insured funds during crisis.

Levonian (2001), for instance, models the pecking order of payoffs to shareholders, depositors and debt holders with special attention to the period of subsidies in the UK. He posited that deposit insurance diminishes the need for depositors to efficiently monitor banks. Similarly, government guarantees provides a form of insurance cover for subordinated debt holders. Hence, they tend to relax their monitoring effort. Higher Tier 2 capital according to him may only induce higher appetite for risk and not necessarily encourage monitoring.

Krishnan et al (2005) focus on the issuance of subordinated debt by banks and examined the response of term credit spreads to changes in risks in the UK. They found that, credit spreads respond to changes in banks' risk, but not dependent on changes in it. They further examine changes in the composition of risk after the first issuance of subordinated debts and found no changes in the attitude of banks towards risk, thereafter. Hence, they conclude that Tier 2 capital is not a devise capable of curtailing the level of appetites of banks towards risk.

Francis and Osborne (2009) analyse monthly data spanning from the period 1996 to 2007 for 168 banks across the UK using a model of bank portfolio behaviour and found positive relationship between capital ratios and capital quality. They also found a negative relationship between quality of banks capital and Tier 2, such that the higher the quality of banks capital, the lower the proportion of Tier 2 components. They, therefore, conclude that stringent capital regulation can enhance financial system stability, hence decline in the probability of crisis. This, according to them leads to fall in credit supply capable of negatively affecting the macroeconomy.

Ng and Roychowdhury (2011) use data for bank failure in the US from 2008 to 2010 to estimate the role of regulatory capitals in averting bank failure using Cox proportional hazard model. They found that, while higher Tier1 capital reduces the risk of failure and vice versa, higher Tier 2 heightens the risk of failure and that the quality of Tier 2 capital was weaker when loan loss provisioning is excessively high, implying that excessive provisioning negatively affects Tier 2, particularly for banks are allowed to add back part of the loan loss reserves or those with poor audit history and high agency problem. They, therefore, conclude that Tier 2 capital is of inferior quality when compared with Tier 1 capital.

Barrell et al (2011) examine the superiority of Tier 1 over Tier 2 capital for 14 countries of the Organisation of Economic Cooperation and Development (OECD). The data covers 713 banks across the 14 sampled countries. Applying ordinary least square (OLS) and logit models, they found a higher Tier 2 proportion to be consistent with poorer risk management.

However, to the best of my knowledge, there is hardly any empirical study on the relative influence of Tier 1 and 2 capital requirements on the risk taking behaviour of banks in Nigeria. Studies however exist on the risk behaviour of banks vis-à-vis other banking fundamentals. For instance, Ezema (2008) uses a panel data of DMBs in Nigeria to investigate how depositors react to changes in the level of risks. With emphasis on the implications of the then regulatory framework introduced by the CBN, he assesses the magnitude of depositors" reaction to changes in banks risk taking behaviour, as well as the disciplining tendencies of the

reactions to DMBs. He uses a two stage framework and two channels approach and found that depositors‟ do not (except inter-bank) significantly reacts to changes in the level of risk of the DMBs and that the behaviour of banks do not agree with "market discipline hypothesis".

Nwosu et al (2012) use panel data covering banks in Nigeria to assess the effect of recapitalisation on the risk attitude of banks. The results established a positive relationship between banks capital and stability, as well as provisioning and impaired credit. They submitted that size and capital determine credit risk and that excessive lending accompanied banking sector consolidation in Nigeria. They, therefore conclude that consolidation serves as an incentive to moral hazard problem. This can be interpreted to mean that risk appetite of banks increases as Tier 1 grows. The study suggests a strong and effective regulation to check moral hazard so as to avoid dampening the benefits associated with recapitalisation exercise.

3. Methodology and Estimation Procedure

Methodology

Following the approach of Barrell et al (2011), dependent variables consider in this study is loan growth rate (LG), reflecting the quantity of lending and by extension the risk appetite of banks. The loan growth reflectsbanks' lending behaviour and/or performance as presented in equations (5) to (7).

Independent variables arethe proportion of Tier 1 (P_c) andTier 2 (S_c)capitals to risk- weighted assets (RWA) and monetary policy rate (MPR). Typically a strong capital base implies a lower default probability for banks and, therefore, attracts lower cost of funding. Banks also get more freedom to explore profitable lending windows. On the other hand, low capital ratio can lead to 'gambling for resurrection' among banks, thereby causing higher default probability for banks and consequently higher cost of funds. LTAreflects the portfolio balance considerations of the banks while MPR represents the policy stance of the CBN.

Accordingly, the estimated equation is:

$$LG_t = \beta + \alpha MPR_t + \theta LTA_t + \omega P_{c_t} + \delta S_{c_t} + \mu_t \qquad (14)$$

Following Pesaran et al (2001), the ARDL format of equations (14)becomes:

$$LG_t = \beta + \sum_{i=1}^{p} \zeta \Delta LG_{t-i} + \sum_{i=0}^{p} \alpha \Delta LX_{t-i} + \delta_1 LG_{t-1} + \delta_2 LX_{t-1} + \mu_t \qquad (15)$$

Where*LG* is loan growth rate, *X* is a vector of independent variables as represented in equations (14),Δ is a difference operator, *L* is logarithm, *t* is time, *t-1* is lag one (previous quarter), $\beta$is an intercept term, ζ,α and$\delta_i$are the coefficients of their respective variables and $p_s$are the lag lengths. Other variables are as defined earlier.

The general error correction version of equation (15) can be presented as:

$$LG_t = \beta + \sum_{i=1}^{p} \zeta \Delta LG_{t-i} + \sum_{i=0}^{p} \alpha \Delta LX_{t-i} + \varpi ecm_{t-1} \qquad (16)$$

Where *ecm*represents the error correction termof equation (15).

The ARDL approach to testing the existence of relationship among variables can be applied without regard to the underlying properties of the regressors. In other words, ARDL is applicable irrespective of whether the underlying properties are purely I(0), I(1)or mutually co integrated. The statistics underlying the *modus operandi* of the ARDL model is either the Wald-statistics or F-statistic in a generalized Dickey-Fuller format, which is used to test the significance of lagged levels of the variables in a conditional unrestricted equilibrium correction model.

More so, ARDL approach is an unbiased and efficient method of co integration analysis, as it has a small sample property. In other words, it yields high quality result, even if the sample size is small. Similarly,

both the long-run and short-run components of the model can be estimated, simultaneously, hence reducing the associated problems of omitted variables and autocorrelations.

Estimation Procedure

There are two stages involved in estimating equations (15). First, the null hypothesis of the non-existence of the long-run relationship among the variables is defined by H_o: $\delta_1 = \delta_2 = 0$. H_o is tested against the alternative of H_1 not H_o by conducting Wald test. If the calculated F-statistics lies below the lower bound as tabulated in Pesaran et al (2001), the null hypothesis cannot be rejected, signifying lack of co-integration. If it is above the upper bound, the null hypothesis is rejected, implying that there is co-integration, but if it lies within the bounds, the result is inconclusive, hence the need for information on the order of integration of the underlying regressors to be able to make a conclusive inference.

4. Empirical Result

Time Series Properties of the Data

Table 1 shows the result of unit root test. The test is based on the semi-parametric testing procedures ofAugmented Dickey Fuller (ADF) and Phillips-Perron (PP). The ADF considersAkaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn Criterion (HQC). The results show that all the series are I(1) variables and significant at 1.0 or 5.0 percent. The data does not contain I(2) series, hence supports the use of ARDL model.

Table 1: Unit Root Test (Augmented Dickey-Fuller and Phillips Perron

Variables	Augmented Dickey-Fuller						Phillips-Perron	
	AIC		SIC		HQC			
	Level	First Diff.	Level	First Diff.	Level	First Diff.	Level	First Diff.
LG	-1.89792	-7.995649*	-1.89792	-7.995649*	-1.89792	-7.995649*	-1.902767	-7.996962*
MPR	-1.27600	-3.312851**	-1.27600	-3.312851**	-1.27600	-3.312851**	-1.299757	-8.720248*
LTA	-1.321345	-8.512636*	-1.321345	-8.512636*	-1.321345	-8.512636*	-1.378014	-8.512728*
Pc	-1.515887	-3.818646*	-1.543719	-4.696943*	-1.883067	-3.818646*	-1.547128	-9.773272*
Sc	-0.822563	-10.18465*	-1.162081	-10.18465*	-1.162081	-10.18465*	-1.162081	-10.18465*

Note*: * and ** implies significant at 1 and 5 per celt level, respectively*

Interpretation of Results of the Estimated Equation

The result as presented in Table 3 indicates that the long-run overall model is well fitted as the independent variables explained about 98.0 percent movements in the dependent variable. The F-statistics of 38.903 is well above the upper critical bound of 5.30 for k = 2 as tabulated by Pesaran et al 2001. This implies that there is long-run relationships among the variables consider in the model. The Durbin-Watson statistics of 2.2118 shows no evidence of the existence of autocorrelation.

The coefficients of *Sc* and *LTA* are not significant hence dropped from the model. While the coefficient of *Pc* is negative and significant at 1.0 per cent level, that of *MPR* although statistically significant at 1.0 per cent but yield a positive result.

Table 2: Statistics for Selecting Optimal Lag Length of the Model

ρ	1	2	3	4	5	6
AIC	-3.995395	-4.010924	-4.272464*	-4.176676	-4.123030	-4.089304
SIC	-3.811389	-3.671026	-3.774288*	-3.517777	-3.300900	-3.101374
HQC	-3.921857	-3.875206	-4.073736*	-3.914094	-3.795738	-3.696436

*Note: ρ is the lag order of the model. * is optimal lag AIC denotes Akaike Information Criterion, SIC is Schwarz Information Criterion and HQC is Hannan Quinn Criterion*

The size of the industry Tier 1 (*Pc*) capital exerts a significant influence on the lending decisions of the DMBs. Lending declines as the primary capital grows. This is consistent with theory and conventional wisdom. Naturally, there should be an inverse relationship between capital and credit creation. An attempt to establish a robust capital base for banks will surely cut down borrowing and consequently decline in earnings. This is in line with the 'bank capital channel thesis' as well as the theoretical model explained in section 2.1. The coefficient of P_c in the equation is perfectly in agreement with equation 13. If we agreed, *ceteris paribus*, as assumed earlier that return on loan is the only source of income to banks, then the principle that applies to profit vis-à-vis P_c is also valid for loan vis-à-vis P_c. This is, because, credit growth is required for robust returns. In other words, as loan grows, all things being equal, profit follows suit and P_c slides.

Table 3: Estimated Long-Run Coefficients, ARDL (1, 0, 0)

Dependent Variable: **LG**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.0507	0.5135	5.9407	0.0000
MPR	0.0100	0.0025	3.6324	0.0005
P	-0.0023	0.0007	-2.9243	0.0047
$R^2 = 0.98$			F-stat = 38.9027 [0.0000]	
Adjusted $R^2 = 0.98$			Durbin-Watson = 2.2118	

The relevant critical values for no intercept and no trend for k = 2 are 3.88 - 5.30. They are obtained from Pesaran et al (2001), Table CI(i) Case I

The coefficient of MPRyielded a positive sign and statistically significant confirmingthe widespread perception about the ineffectiveness of MPR as an anchor of monetary policy by the CBN The direct relationship entails that, for instance, increase in MPReither increases the credit creation capability of the banks or boosts their appetite to create more credit. Theoretically, increasein MPR serves as a signal to the banking sector on the need to create less credit, arising probably from excess liquidity in the system, which is capable of triggering inflation that could at the end instigate loan default. In other to avoid default crisis, therefore, banks utilise the information contain in the signal, by reducing lending.It can also be interpreted as increase (or decrease) in the cost of borrowing arising from upward (or downward) adjustmentof MPR which is capable of scaring (or attracts) away borrowers.In other words, as CBN increases/reduces the anchor rate, the price of funds increases/declines and the law of demand take its course. (i.e. demand falls/rises as the case may be). Practically, however, there seems to be a general notion by observers that *MPR* as it is, is meant to discourage DMBs from approaching the CBN for life line, so as to enhance interbank transactions.

Therefore, the response of loan growth to MPR is inconsistent with theory on the reaction of bank lending to monetary policy shocks. Monetary tightening, for instance, should lead to reduction in reservable deposits, but increase in market interest rate. If this context works, two channels are obvious with which lending can be affected: the traditional bank lending channel or through the direct mechanism of bank capital channel.

Ifbank lending channel is at work, it pre-supposes that monetary tightening affects lending principally due to the inability to raise funds or lay-off assets, at least in the short-run, to offset drop in reservable deposits. This channel is probably rendered inefficient in Nigeria, perhaps due to alternative sources of funding such as standing lending facility of the CBN and/or certificate of deposits (CDs) that are not subject to reserve requirements. Banksprobably resort to these funds to off-set the drop in funding squeeze arising fromincrease in MPR.

However, if bank capital channel thesis is at work, monetary tightening should lead to increase in interest rate and sincethe cost of deposit can be renegotiated but most loan portfolio cannot, in an ideal situation the cost of deposits naturally adjust upwards, resulting in maturity mismatch and consequently shrinking profit and capital. Since, it is not easy to issue new shares, banks are left with only the option of reducing lending or else they fall short of meeting the regulatory capital requirements, as they will use own capital to create new assets. This channel seems to be inoperable in Nigeria during the studied period.

Error correction model (ECM) presented as equation (16) is estimated to determine the adjustment of the cointegrated variables towards equilibrium. The result is presented in Table 4. Four basic facts emerge from the ECM result: One, the error correction term appeared with a negative sign and statistically significant at 1.0 percent. This shows that the series is non-explosive and that long-run equilibrium is indeed attainable. Two, adjustment towards long-run equilibrium, in case of shock in the economy (1-α) is amazingly slow. Three, Tier 2 capital, even in the short-run plays no role in influencing the risk appetite of banks in Nigeria; and four, the efficacy of *MPR* in doubt in curtailing the risk behaviour of banks in Nigeria is still in doubt.Post estimation tests show that the model is autocorrelation and heteroskedacity free.

Table 4: Error Correction Estimates of the ARDL Model

Dependent Variable: Δ**LG**				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.003	0.004	0.850	0.398
Δ*LG(-1)*	0.884	0.182	4.872	0.000
Δ*LG(-2)*	-0.133	0.107	-1.243	0.218
Δ*P(-2)*	0.003	0.001	1.905	0.061
Δ*P(-3)*	-0.004	0.001	-2.707	0.009
Δ*S(-3)*	-0.034	0.022	-1.556	0.125
ECM(-1)	-1.109	0.226	-4.902	0.000
R^2 = 0.36	Adjusted R^2 = 0.30		Durbin-Watson stat = 2.017	
Breusch-Godfrey Serial Correlation LM Test				
F-statistic	1.7045	Prob. F(2,63)	0.1902	
Obs*R-squared	3.6959	Prob. Chi-Square(2)	0.1576	
Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	1.7076	Prob. F(6,65)	0.1333	
Obs*R-squared	9.8036	Prob. Chi-Square(6)	0.1332	

Overall, the results suggest that Tier 1 (*Pc*) capital exerts a significant influence onthe risk appetite of banks in Nigeria thereby lending support to the submission that Tier 1 is superior to Tier 2 at-least in terms of going-concern.

Stability Test

The stability of the equations and their estimated parameters are tested using cumulative sum of recursive residual(CUSUM) and cumulative sum of squares of recursive residual (CUSUMSQ) tests.The results are presented as figures 1 and 2. CUSUM uses the cumulative sum of the equation errors in the regression together with the critical lines of 5.0 percent. CUSUMSQ, on the other hand, uses recursive double errors. The parameters are said to be stable if the sum of recursive errors lies largely within the two critical lines. On the whole, graphs of CUSUM and CUSUMSQ show that the parameters of the estimated equations are stable at 5.0 per cent, given that the recursive errors lie within the two critical lines of both the CUSUM and CUSUMSQ tests, except for the CUSUMSQ (i.e. figure 3) that slightly fall outside the critical line sometimes around February/March 2009.

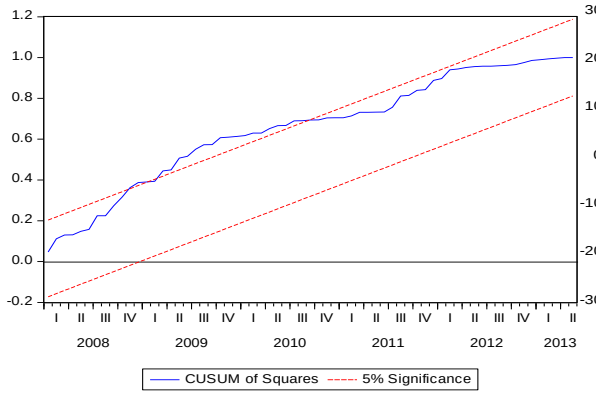

Figure 1: CUSUM of Recursive Residual Test

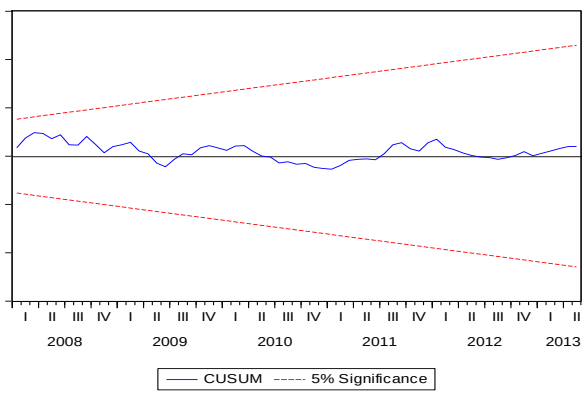

Figure 2: CUSUMSQ of Recursive Residual Test

5. Conclusion

The study, in attempt to contribute to an unending debate between policy makers and academic researchers, on the relative importance of Tier 1 over Tier 2 capital requirements employsan Autoregressive Distributed Lag (ARDL) to determine the short and long-run relationships amongregulatory capitals and the variables surrogating the banks risk taking behaviours in Nigeria.The risk characteristics of banks were represented by credit portfolio. While Tier 1 (Primary Capital) andTier 2 (Secondary Capital) constitute, among others, the right hand side of the equation.

The results indicate that Tier 1 capital is more influential in determining the loan growth rate in tune with the view of the policy makers who opine the superiority of Tier 1 over Tier 2.In fact, Tier 2 has to be dropped to attain parsimony in the equation. The results, therefore, supports the view of policy makers that Tier 2 is inferior to Tier 1 at least in terms of 'going concern'.

The weakness of Tier 2 can partly be attributed to its consideration of loan loss reserve. Loan loss reserves increases as non-performing loan increases, this therefore, dilute the quality of Tier 2 as certain component of loan loss reserves are added back to it. In fact, as pointed out by Ng and Roychowdhury (2011) banks can even deliberately increase loan loss reserves to pass regulatory examination, since it is partially a constituent of Tier 2 capital[10]. The higher the component of loan loss reserves in Tier 2, the lower the quality of the capital.

An ancillary achievement of this paper is that, although, the results confirm the superiority of Tier 1 over Tier 2 capital, it downplays the role of MPR in the loan decision making of banks. This is rather an

[10] The Basel I accord provides that loan loss reserves can formed part of Tier 2 capital and in-turn total capital as long as Tier 2 capital is less than 1.25 percent of risk-weighted assets.

interesting finding, which as a consequential policy implication, as it suggests that, policy makers should not relyheavily on the anchor rate as a tool of changing banks' attitude towards risk.

Finally, in order to enhance the influence of regulatory capitals on the risk attitudes of banks in Nigeria, the author is of the view that the weights of risk assets in the solvency ratio should be market based. This will ensure that the required level of efficiency as desired by the regulators in the capital standard is achieved. If the weights of the risk assets are considered at market value instead of book value,regulatory capital requirements will mirror, to a large extent, the exactrisk of the banks, since falsification of the asset portfolio will be impossible or rather difficult.Although, it is a common knowledge that the market value is also volatile and can, therefore, be uncertain, but it is rather closer to the reality than the book value. The market value of the assets of most bank, are in most cases far below their book value.

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