POLICY BRIEF

Regulatory Capital Requirements and Risk-Taking Behaviour: Evidence from the Malawi Banking System

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Abstract

Proponents of stringent regulation argue in favour of higher capital requirements as it is said to promote financial stability. Opponents of higher capital requirements argue that capital adequacy rules might not enhance stability but might in fact increase a bank's riskiness. The paper test this hypothesis with a dynamic panel data model for eight Malawian commercial banks. Results reveal that there is high persistency in risk-taking behaviour of Malawian banks. Further, the study finds that high capital ratios reduce bank risk-taking behaviour of Malawian banks through reduction in Non-Performing Loans (NPLs) ratio

and investment in high risky assets. Based on these results, imposition of stringent penalties on banks that fail to meet minimum capital requirements and strict enforcement of regulation is key to ensuring that all banks sustain sufficient capital buffers and hence safeguard stability of the banking system.

Introduction

The increased emphasis on risk-based micro prudential regulation has reignited the long-standing debate on the effect of capital requirements on banks' behaviour. Despite the debate and recent progress in research on the issue, literature is inconclusive. In Malawi, despite the regulatory authorities implementing various measures of risk-based capital regulation, it is not certain whether these measures have restricted bank managers in taking excessive risks. Proponents of stringent regulation argue in favour of higher capital based on two arguments: firstly, capital limits promote financial stability since they are a buffer that absorbs losses and hence reduce the risk of insolvency and therefore mitigate systemic risk factors (Perrotti and Vlahu, 2011). Secondly, the argument is premised on the option-pricing model in that capital requirements restrict bank shareholders (who are provided with limited liability) to take excessive risk (Meckling and Jensen,1976; Kahane, 1977; Kareken and Wallace, 1978; and Admati and Hellwig, 2013).

Opponents of higher capital requirements argue that capital adequacy rules might not enhance stability but might in fact increase a bank's riskiness. The intuition behind this is that flat capital requirements would restrict a bank to maximize utility, forcing it to reduce leverage and restructure its portfolio of risky assets, thereby increasing the probability of failure (Blum, 1999; Kahane, 1977; Koehn and Santomero, 1980). Further, risk-based capital regulation might not necessarily reduce bank risk-taking as systemically important banks exploit the implicit public guarantee by taking higher risk even with stringent capital regulation, knowing they would be bailed out in case of financial turmoil (Stolz, 2002). It is also argued that high capital requirements might push intermediation out of the banking system into unregulated entities, possibly increasing systemic risk (Dagher et al., 2016). Furthermore, Perrotti and Vlahu (2011) argue that higher capital may have an unintended effect of enabling banks to take more tail risk without the fear of breaching the minimum capital ratio in non-tail risky project realization. Meanwhile, another strand of literature demonstrates that banks often hold capital ratios well above the minimum requirements and, as such, they are not constrained by capital regulation and have their own target capital and risk-taking levels (Rime, 2001; Calem and Rob. 1996; Floquet et al., 2008).

Notwithstanding the above divergent views, contemporary banking literature has stressed the role of corporate governance in risk-taking behaviour of banks. It is argued that independent boards are likely to exercise effective control over managers and

hence would promote corporate performance, including limiting managers to take excessive risk. In a similar line of thinking, Minton, Taillard and Williamson (2010) argue that larger and more independent boards are associated with lower levels of risk-taking. This view is also shared by Kirkpatrick (2009) who argues that weak boards might lead to insufficient monitoring of managers' actions, which might eventually lead to excessive risk-taking behaviour.

Further, another strand of corporate governance literature that capitalizes on agency paradigm argues that while alignment of management incentives with bank owners may ameliorate the shareholders-manager agency problem, this might not necessarily limit bank managers to take excessive risk. Kose and Yiming (2003) and Anginer et al. (2018) argue that in fact this might create strong incentives to undertake high-risk investments even when they are not realizing positive net present value investments. From the foregoing theories and mixed empirical evidence, the effect of capital requirements and corporate governance on risk taking behaviour of banks, therefore, becomes an empirical question.

In Malawi, through the Reserve Bank of Malawi (RBM), the Registrar of financial institutions as a supervisory and regulatory authority has been imposing minimum capital requirements for banks to ensure that the banking sector is sound and stable. These regulations have evolved over time, in line with the requirements in the Basel Accord by the Basel Committee on Banking Supervision (BCBS). For instance, in June 1993, the capital adequacy requirement directive came into effect in line with the Basel I under which all banks were expected to maintain core capital and total capital ratios of 4.0% and 8.0% or more, respectively. Later, in line with the Risk-Based Approach (RBA) to supervision, and to ensure that banks evaluate, monitor, and control all material[1] risks, the RBM adopted risk management guidelines in 2010. Thereafter in 2013, credit and market risk-based capital regulations were adopted. Later in January 2014, the RBM fully migrated to Basel II standards where banks were required to maintain minimum core capital and total capital ratios of 10.0% and 15.0%, respectively. These directives were therefore, expected to enhance risk management by bank managers, which would in turn limit excessive risk-taking.

However, despite implementing various measures of risk-based capital regulation and hence revision of capital requirements, credit risk was increasing. Risk weighted assets were persistently high, above 50%, more particularly for the two domestic systemically important banks, though slightly declining in the later years. Further, in the latter years, asset quality was deteriorating significantly as evidenced by increase in the ratio of Non-Performing Loans (NPLs) in the banking system. NPL ratio in Malawian banking system was mostly above the prudential maximum of 5% for the past decade or so. In very few

1 Material risks include strategy risk, credit risk, liquidity risk, interest rate risk, foreign exchange rate risk, price risk, operational risk, compliance risk, reputational risk.

years was the ratio below the regulatory maximum requirement. This, therefore, puts an empirical question as to whether adoption of risk-based capital regulation has really helped Malawian banks in their risk exposures. What has been the impact of stringent capital regulation on Malawian banks? What about bank governance-related factors; do they matter in terms of risk-taking behaviour of Malawian banks? What are the other factors that influence the risk-taking behaviour of Malawian banks?

Against this background, the paper aims to investigate the impact of capital requirements on Malawi's banks risk-taking behaviour for the period 2010 to 2017. In particular, the study investigates the relationship between regulatory capital and risk-taking behaviour of Malawian banks. Further, the study examines the effect of banks' governance-related factors on the risk appetite of Malawian banks. The study is restricted to this period due to unavailability of granular data in the earlier period. While there is a lot of work on the subject for developed economies, emerging markets and Asian countries, very little work has been done for developing countries. To the best of our knowledge, no empirical work of a similar nature has been done for Malawi. As such, the results from the study are expected to inform policy and regulation of the Malawian banking system and thus enhance the stability of the Malawian financial system.

Capital Regulation in the Malawi Banking System

As alluded to earlier, the Reserve Bank of Malawi (RBM) as a supervisory and regulatory authority imposes minimum capital requirements on banks to ensure that the banking sector is sound and stable. These requirements have evolved over time in line with the standardized requirements by the Basel Committee on Banking Supervision. The Malawian banking system has, for instance, this far adopted Basel I and Basel II, which entailed adoption of various banking rules.

For instance, in line with the Basel I Accord, the capital adequacy directive came into effect in June 1993 and, under this directive, all banks were required to maintain core (Tier 1)[2] and total capital (Tier II) ratios of 4% and 8% or more, respectively. At that time, assessment of banks' compliance to prudential requirements was based on CAMEL[3], with risk-based assessment running in parallel with CAMEL.

2 In Malawi, core capital comprises paid up capital; retained profits; current year profits; and share premiums. While total capital includes core capital plus revaluation and other statutory reserves.

3 Is a supervisory ratings system of banks condition and stands for Capital adequacy; Assets; Management Capability; Earnings; Liquidity (also called asset liability management)

Further, with the advent of globalization and increased innovation of financial services, new risks emerged requiring attention of both bank management and supervisory authorities. In response to this, the RBM adopted a Risk-Based Approach to Supervision of Financial Institutions in 2007 in line with Basel II Accord. The aim was to foster sound risk management systems among banks in Malawi. The new rules meant that financial institutions were to use the standardized approach for calculating the capital requirement for credit, market, and operational risks. In view of the complexity and costs involved under Pillar I of the Basel II, the RBM strategy was to implement Basel II in a phased manner.

In March 2013, the RBM adopted credit risk-based capital regulation for all banks. The objective was to assist banks to appropriately incorporate credit risk in measuring capital under the standardized approach under Pillar I of Basel II. Banks were required to measure their capital position through a risk-based capital ratio, which was calculated by dividing its capital base by total risk-weighted assets. In calculating risk-weighted assets, banks had to use three categories of risks and apply weights ranging from 0% to 100% depending on institution and type of exposure. In April 2013, the risk-based capital regulation was amended further to incorporate market risk of banks into the regulatory capital and risk weighted assets calculations.

In January 2014, Malawi fully migrated to Basel II standards to strengthen financial sector stability. Under the Basel II regime, banks were required to maintain minimum core capital and total capital ratios of 6.0% and 10.0%, respectively. However, Malawi opted for higher minimum capital adequacy ratios of 10% for core capital and 15% for total capital than under Basel II standards, considering the banking business environment and factoring in the possible errors in capital calculation that could result from inadequate or poor-quality data and inadequate risk management systems. The RBM further took additional steps to strengthen the soundness of the financial sector, which in a way would affect their capital positions. For instance, to enhance the provisioning for NPLs, an asset classification directive was enacted in May 2014 based on the Estimated Recoverable Amount Method (ERAM).

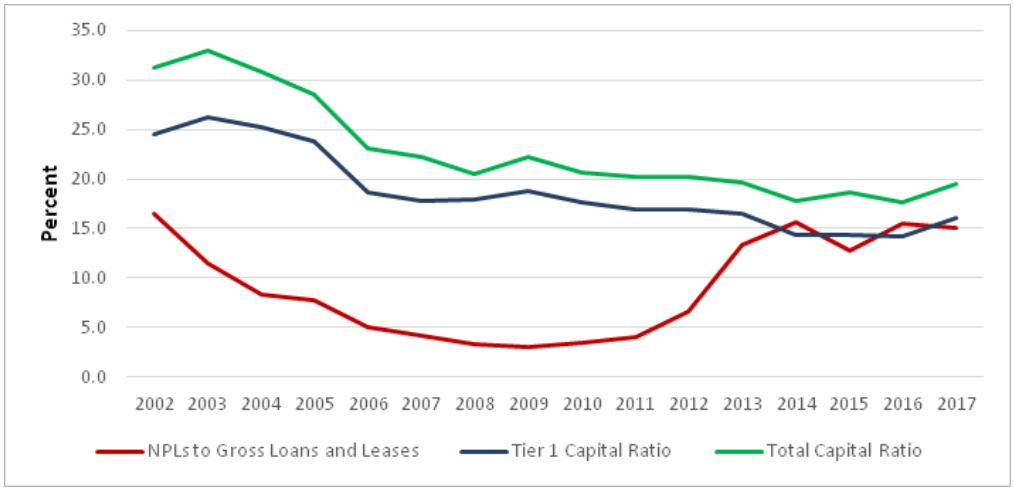
The directive imposed a provisioning rate that increased by 16.7 percentage points per quarter on loans past due after 90 days, up to 100 percentage points after 18 months. The new directive was expected to increase the provisions to NPLs to minimize capital loss in the event of borrowers' loan default. Meanwhile, a Prompt Corrective Action (PCA) framework was enacted in May 2014 to strengthen the legal framework for early intervention and bank resolution. The PCA directive clarified and enhanced existing triggers for early remedial actions for banks in financial distress. Under Basel II Pillar II, banks were required to conduct stress tests and internal capital adequacy processes (ICAAP) in relation to their strategy, business and financial projections and all material risks (RBM, 2015).

Apart from the risk-based capital requirements, there were also several directives put in place to ensure that banks manage their risks well. For instance, in 2008, a directive on large exposures was put in place. Under this directive, large exposures were not to exceed 25% of a licensed institution's capital base. Further, the aggregate of a licensed institution's large exposures was not to exceed 800% of its capital base.

Despite the RBM undertaking an oversight role over banks through periodic off-site and on-site inspections, a few banks failed to meet the minimum capital requirements over the years. Consequently, they were either re-capitalized by shareholders, merged with other banks or even taken over. For instance, in 2006, one private-owned bank that for some time had both its Tier 1 and total capital ratios below the minimum requirement went into voluntary liquidation following regulatory pressure. In 2016, two public-owned banks with regulatory capital challenges were acquired by existing domestic private-owned banks. Similarly, in 2017, one foreign-owned private bank was merged with another domestic-owned private bank due to failure by its shareholders to inject additional capital to bring the capital ratios above the regulatory benchmarks. However, other two domestic-owned private banks that were experiencing capital challenges were fully re-capitalized by the shareholders at the end of 2017 as directed by RBM.

From the foregoing analysis, therefore, it can be deduced that type of bank ownership matters considering adherence to bank capital regulation in Malawi. The above notwithstanding, overall core and total capital ratios remained above the minimum regulatory requirement, even though exhibiting a downward trajectory (Figure 1).

Figure 1: Trends in capital ratio and non-performing loans ratio



Source Reserve Bank of Malawi

Asset structure of Malawian banks

Prior to the adoption of more stringent capital regulation, thus Basel II, total loans constituted about 50.0% of total banking sector assets between 2010 and 2014 (Table 1). However, the share of total loans and leases to total assets dropped when the country adopted Basel II, reaching a low of 26.8% in 2017. Investments in securities were progressively increasing to a proportion higher than loans in total assets. Trend in the data, therefore, suggests that the adoption of more stringent capital requirement led to unintended results as intermediation evidently dropped.

Table 1: Classification of assets for Malawi banking system (% of total assets)

Type of assets	2010	2011	2012	2013	2014	2015	2016	2017
Loans and Leases (%)	51.9	53.3	50.1	39.3	38.2	38.4	33.7	26.8
Securities and Investments (%)	18.4	19.4	12.2	18.6	17.9	28.6	31.1	39.2
Other assets (%)	29.8	27.3	37.7	42.1	43.8	33	35.2	34

Source: Reserve Bank of Malawi (2017)

Lending structure of Malawian banks

In almost all the nine banks in Malawi, over 80.0% of loans were channeled to private entities, and the rest to the government, statutory bodies, and Non-Governmental Organizations (NGOs). In terms of loan allocation to clients, seven (7) banks channeled over 70.0% of the private sector loans to private corporations (such as Small and Medium Enterprises - SMEs and large enterprises) over the sample period. These loans comprised loans for financing agricultural production, commercial and industrial loans, and foreign exchange loans. Individual and household loans accounted for an average of only 15.0% of total loan book in these seven (7) banks. Meanwhile, the remaining two banks allocated a large part of their loan book (about 50.0%) to individuals and households in line with their lending business models that focus on small clients. Nevertheless, type of ownership or management did not influence individual bank's business lending models as the seven banks that focused on lending to SMEs and large enterprises consisted of both private-owned and foreign-owned banks, similarly for the two banks that mostly lent to individuals and households.

In terms of the sectoral allocation, the loans were mainly concentrated in a few sectors, with over 70.0% of banking sector total loans and leases channeled to five sectors between 2012 and 2017 (Table 2). Lending to the wholesale and retail constituted the highest proportion of total loans and leases, followed by agriculture and manufacturing holding the second and third largest proportion of total banking sector loans and leases to the private sector, respectively.

Table 2: Distribution of loans by sector

Sectors	2012	2013	2014	2015	2016	2017
Wholesale and retail trade	21.7	21.9	24.1	22.2	24.4	24.0
Agriculture	17.8	21.5	19.6	23.6	19.6	23.2
Manufacturing	10.1	15.1	15.5	21.1	18.0	16.5
Community, social and personal	11.8	10.3	11.8	10.5	14.0	10.5
Transport and communications	11.6	11.7	9.9	5.2	6.9	4.0
Other sectors	7.0	4.8	5.3	6.7	5.7	7.7

Source: RBM annual reports 2017

This notwithstanding, individual bank data reveals that the sectoral composition of the loans differed between domestically owned banks and foreign-owned banks. Domestically owned banks largely diversified across all sectors while foreign-owned banks largely concentrated in agricultural, manufacturing, and community and personal services sectors.

Trends and sectoral composition of NPLs in the Malawian banking system

Asset quality as measured by the ratio of NPLs in the Malawi banking system exhibited a mixed trend but persistently deteriorated in the later years. Asset quality was improving tremendously from 2002 to 2004 (Figure 1), as evidenced by sharp decline in the NPLs ratios, which stood below the maximum regulatory benchmark of 5.0% until mid-2012. This was mainly due to favourable macroeconomic environment coupled with prudent loan administration by banks (RBM, 2003). During this period, the macroeconomic environment was characterized by declining lending rates, stable inflation and exchange rate coupled with increased economic activity. However, after September 2012, quality of the assets started deteriorating rapidly and the NPLs ratio reached a peak of 17.0% by December 2016 but later improved to 15.7% in 2017. Nonetheless, in December 2017, all banks except one had high NPLs ratio above the maximum regulatory requirement.

In terms of sectoral disaggregation, these NPLs were mostly in the wholesale and retail sectors, followed by agricultural, transport and manufacturing sectors. The high default rate in these sectors was due to reduced performance in these key sectors of the economy following an adverse macroeconomic environment as evidenced by high levels of interest rates, inflation rates, exchange rates and slowdown in economic growth.

Data source

To analyze the impact of capital requirements on risk-taking behaviour of Malawian banks, we adopt the partial adjustment framework, following existing literature (Bertrand, 2000; Floquet & Biekpe, 2008; Ashraf et al., 2016). This framework is adopted based on the argument that banks may not adjust their risk instantaneously in response to a change in capital regulation or other relevant factors. Instead, banks adjust their risk levels over time. Further, since risky investments provide higher returns than risk-free investments, banks tolerate a certain level of risk to achieve their objective of profit maximization.

Regarding banks' corporate governance, literature suggests that capital regulation has a different impact on individual bank's risk-taking behaviour depending on their corporate governance structure. More powerful shareholders advocate for more bank risk-taking than debt holders and non-shareholder managers (Galai and Masulis, 1976; Meckling and Jensen, 1976; Laeven and Levine, 2009; Abou-El-Sood, 2017). Further, it is also argued that an independent board may exercise effective control over managers and hence would promote corporate performance. This view is also shared by Minton, Taillard, and Williamson (2010) who found that larger and more independent boards are associated with lower levels of risk taking. As such, the impact of stringent capital regulation on risk-taking of individual banks may vary depending on several corporate governance factors, including whether ownership is concentrated or not, thus involvement of shareholders in the management of the institution; size of board of directors; and number of outside or independent directors on the board for the institution.

In this study, we incorporate a bank's corporate governance factor by using a measure of the board structure. We did not use ownership structure (involvement of shareholders in the management of the institution) as data revealed that ownership is highly concentrated in all the nine banks in Malawi, such that there is no variation in the variable. We therefore use the number of outside directors in the board for individual banks at time t (to capture the corporate governance factor. Following Abou-El-Sood (2017), outside directorship is measured by the ratio of number of outside directors on the board-to-board size, where board size is measured as the total number of board directors. *A priori*, the relationship between the ratio of outside directorship and risk-taking behaviour is expected to be negative as the more independent the directors, the more the board can carry out its oversight function effectively.

In terms of bank level control variables, we include bank size (*SIZE*) measured as market share, which is the ratio of an individual bank's assets to total assets for the banking system. Common wisdom suggests that bigger banks are more likely to take risky positions, like the results by Teresa and Dolores (2008) for the Spanish banking system. However, in other instances, smaller banks may take more risky positions to

increase their market share in line with results by Hakimi et al. (2012) for the Tunisian banking system. The expected sign of the coefficient, therefore, is unknown *a priori.*

The study also includes Return on Assets (*ROA*) as a measure of bank profitability, computed as the ratio of net income to average total assets. Theoretically, an increase in *ROA*, which could either be due to an increase in net interest income or non-interest income puts a bank at a competitive position, hence more likely to reduce the risk appetite of banks. Conversely, a reduction in profits could lead managers to take risky positions to meet their objective. The conventional view is that higher risk is associated with greater probability of higher return. This therefore implies that there is a natural two-way causality between *RISK* and *ROA*. A broad measure of profitability is used as most Malawian banks' non-interest income is significantly high. The expected sign therefore is negative.

The study also includes the variable, loan to asset ratio (*LASSET*), proxying the evolution of the credit risk taken when creating bank assets (Floquet and Biekpe, 2008). Further, the paper includes a variable to capture ownership of the bank (*OWNERSHIP*) that is whether a bank is domestically- or foreign-owned. The dummy variable takes the value of one where there is dominant foreign shareholding, otherwise zero.

Further, considering that the study period corresponds to a period of macroeconomic instability, banks' risk appetite in Malawi might also be influenced by macroeconomic variables. In addition, other studies have found macroeconomic variables to be important drivers of bank risk-taking behaviour. For example, Laeven and Majnoni (2003) and Bikker and Metzemakers (2005) found provisioning decisions to be associated with economic growth, apart from banks' lending behaviour and capital strength. Similarly, Davis and Zhu (2009) and Barrel et al. (2010) found provisioning to be correlated with GDP growth. As such, following this literature, we include GDP growth to control for macroeconomic variables and, *a priori,* we expect a negative sign.

Conclusion and policy recommendations

The study investigated the impact of regulatory capital requirements on risk-taking behaviour of Malawi's commercial banks. The study used panel dataset for eight (8) commercial banks in Malawi covering the period 2010(Q1) to 2017(Q4). Using system GMM estimation techniques, our results reveal that there is high persistence in bank risk-taking behaviour. Further, the results of the study show that high capital ratios reduce bank risk-taking behaviour in Malawi through reduction in NPLs ratio and investment in high-risk assets. Although the debate on whether bank capital requirements influence risk-taking behaviour of banks is still inconclusive, results for the Malawi banking system reaffirm the propositions that argue in favour of higher capital regulation in controlling risk-taking behaviour of banks.

Based on the findings of this study and considering that the Malawi banking system had persistently very high NPLs ratio since early 2012, imposition of stringent penalties on banks that fail to meet minimum capital requirements is also key to ensuring that all banks sustain sufficient capital buffers while at the same time ensuring low risk exposure by banks. Thus, enhanced capital regulation coupled with close supervision can help in forcing banks to consistently maintain high capital ratio above the minimum regulatory risk-based capital requirement, which would in turn reduce overall risk in Malawian banks. That said, there is need to closely monitor the activities of the banking sector to ensure that capital regulation does not encourage banks to shift from intermediation into investment of risk-free assets such as government bonds.

Contrary to expectations, the study finds that the structure of board of directors does not significantly influence risk-taking behaviour of Malawian banks. This is contrary to the hypothesis that postulates that independent directors do matter in limiting commercial bank managers' risk appetite. This could be suggestive that other factors do matter in influencing the risk-taking behaviour of Malawi commercial banks.

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