



ASSESSING CAPITAL STRENGTH IN ZIMBABWE'S BANKING SECTOR: A COMPREHENSIVE ANALYSIS (2009-2013)

Nomsa Sibongile Dube and Farai Tatenda Chikwavaire

Department of Economics, University of Zimbabwe

Abstract: *The aftermath of the 2008-2012 global financial crisis underscored the deficiencies in existing prudential regulatory frameworks, prompting a call for comprehensive reforms. A critical lesson learned was the inadequacy of banking sector capitalization, revealing vulnerabilities that threatened financial stability. Moreover, previous financial crises have illuminated the limitations of solely prioritizing price stability as a monetary policy objective. It has become increasingly evident that while robust micro prudential regulations and supervision are essential, they alone are insufficient to mitigate risks to financial sector stability. In response to these lessons, monetary authorities must embark on initiatives aimed at enhancing the resilience of the financial sector. This involves fortifying regulatory mechanisms to complement existing guidelines, thereby bolstering the sector's ability to withstand shocks and crises.*

Keywords: *Financial crisis, Prudential regulation, Monetary policy, Banking sector, financial stability.*

I. INTRODUCTION

The 2008-2012 global financial crisis brought to the fore the inadequacy of the then existing prudential regulatory arrangements and thus invoking various initiatives for reform. One of the main lessons from the crisis was that the banking system held insufficient capital. The past financial crises have further demonstrated that price stability is not the only monetary policy goal to be achieved. Furthermore, it has been proven that robust micro prudential regulation and supervision are necessary but not sufficient conditions to guard against risks to the financial sector stability. These lessons imply that the monetary authorities have to develop initiatives to increase resilience of the financial

sector by developing stronger regulatory mechanisms to support the already existing guidelines (Gunadi *et al*, 2011).

In order to improve the financial sector's resilience to external shocks, policymakers have resorted to using minimum capital requirements to achieve that objective. When banks are well capitalized, they are expected to be adequately prepared to withstand the negative consequences of shocks. Thus, the negative effects of the 2008-2012 global crisis brought to the fore the need to have adequately capitalized banks that can withstand external shocks.

Minimum capital requirements play a critical role in the supervision and regulation of banks. To that end, the Reserve Bank of Zimbabwe (RBZ) has been reviewing the minimum capital requirements for banks in line with the existing economic conditions and international best banking practices. After announcing the new capital requirements in July 2012, the then Governor pointed out that undercapitalized banks were not only a risk to the financial system but were inimical to economic development. In that vein it was necessary to introduce new capital requirements so as to ensure that banks play a meaningful role in economic development (RBZ, Monetary Policy Statement, 2012). The effectiveness of the policy is however, based upon the relationship between capital levels of banks and their performance. The paper therefore seeks to establish the relationship between capital levels and banks' performance.

Banks' performance refers to the capacity by banks to generate sustainable profitability. The knowledge of the relationship between capital levels of banks and their performance is useful to policymakers in formulating policies that would enhance stability of the financial sector. A stable financial sector attracts investors to the sector. The Reserve Bank of Zimbabwe introduced a regulation in July 2012 revising minimum capital requirements from US\$12.5 million to US\$100 million despite the non-existence of prior empirical investigation to establish the relationship between capital levels and banks' performance in Zimbabwe. This is what motivated this present study.

The study has five sections: Section II discusses the theoretical and empirical framework of minimum capital requirements. Methodological developments are discussed in Section III. Estimation and interpretation of results are presented in Section IV. Finally, Section V discusses the major findings and policy recommendations.

II. LITERATURE REVIEW

The investigation of the relationship between capital levels and banks' performance is based on the classical finance theory, irrelevance of capital structure, presented by Modigliani and Miller in 1958. Although the basis of the theory is hardly related to banks, several researchers have applied the theory as the starting point when analyzing the banking sector's capital structure and performance relationship. In their famous propositions, Modigliani and Miller (1958) showed that in a frictionless economy, where all investors have full access to information, the way a firm is financed does not affect performance. Thus, according to Modigliani-Miller framework the structure of bank capital does not have an impact on the cost of capital. Thus, an increase in capital requirements will not affect banks' funding costs and therefore lending to the real economy is likely to remain the same. The theory implies that while capital is important to a firm, its structure is irrelevant to banks' performance. The thinking implies that banks can raise either their equity or debt capital for better performance.

The Basel I Accord (1988) recognized that higher capital enhances positive performance of banks, hence the requirement for a certain level of bank capital. The capital requirement was meant to promote the soundness and stability of the international banking system. In that regard, banks were required to hold capital in line with their perceived risk assets. After Basel III Accord Nout Wellink, Chairman of the Basel Committee on Bank Supervision said "the combination of a much stronger definition of capital, higher minimum capital requirements and the introduction of new capital buffers will ensure that banks are better able to withstand periods of economic and financial stress, therefore supporting economic growth" (Wellink, 2011).

In general capital represents the portion of a bank's assets which have no associated contractual commitment for repayment. Thus, it is available as a cushion in case the value of the bank's assets declines or its liabilities rise. Many developing countries have experienced banking problems requiring major reforms to address weak banking supervision and inadequate capital. In addition to deposit insurance (implicit or explicit), official capital adequacy regulations play a crucial role in aligning the incentives of bank owners with those of depositors and other creditors.

Theory provides conflicting predictions on whether capital requirements retard or promote bank performance and stability. The soundness of the banking system is important not only because it limits economic downturns related to financial panics but also because it avoids adverse budgetary consequences for governments, which often bear a significant part of the costs of bailouts. Hoggarth and Saport (2001) used results from a cross-country study of high, medium and low-income countries to claim that reorganization of troubled financial intermediaries' cost between 20% and 50% of Gross Domestic Product (GDP), while Honohan and Klingebiel (2000) argued that the period of ensuring financial stability can go up to nine years. The banking crisis in Zimbabwe cost the country up to US\$24.4 million in terms of the troubled bank fund (RBZ, 2004).

Expectations are that the higher capital requirements as expounded by the Basel Accord would result in banks reducing risky assets such as commercial paper from their portfolios. Some authors have argued that stringent capital requirement comes at a cost. When regulatory capital is increased, banks will be constrained to some extent by competitive pressures, which would occur due to competition on loans, deposits and even the sources of equity and debt investments (Agoraki *et al.*, 2011; Bolt and Tieman 2004)). Against this background, banks are likely to reduce lending, increase their lending rates and pay less on deposits in order to restore an acceptable return on the larger capital base provided the demand for loans is inelastic to higher lending rates.

However, on a positive note, regulatory capital will ensure that the financial system is insulated from economic and financial crises. This will therefore make the financial system more stable hence contribute to economic growth. The primary goal of macro prudential policy is to monitor and reduce systemic risk which is the risk of developments that threaten the stability of the financial system as a whole and consequently the broader economy (Bernanke, 2009).

The empirical literature undertaken to analyze the effects of capital requirements on banks' performance has focused on the analysis of either a panel of countries or single country studies. The panel of countries studies have mainly focused on developed economies and emerging markets (Agoraki *et al.*, 2011, Demirguc-Kunt *et al.*, 2003, Van Roy (2003) and Chiuri *et al.* (2002)). Agoraki *et al.* (2011) used panel data to analyze the relationship between regulation, competition and bank risk taking behavior in transition countries for the period 1998-2005. The study defined regulation as capital requirements, restrictions on banks activities and official supervisory power. Findings of the study revealed that banks with lower market power tend to take on lower credit risk and have lower probability of default. The study also noted that capital requirements have the tendency to reduce credit risk, but this effect weakens for banks with substantial market power.

Researchers who have looked at the impact of capital requirements on bank competition and performance on single countries include Angelini and Cetorelli (2003), Yudistira (2003), Kamau *et al.* (2004), Lin *et al.* (2005), and Naceur and Kandil (2009). Naceur and Kandil (2009) analyzed 28 Egyptian banks for the period 1989-2004 to establish the effects of capital regulations on the

performance and stability of banks in that country. Findings of the same were that as the regulatory capital increases the risk for shareholders is also increased resulting in banks increasing their lending rates in a bid to achieve a higher return on assets.

A number of researchers have tried to show the effects of banks' capital levels on banks' intermediary role in the economy (Peek and Rosengren (1995), Blum and Hellwigg (1995), Furfine (2001), Diamond and Rajan (2000), Chiuri, Ferri and Majnorni (2001) and Yudistira (2003)). Most of these studies point to the assertion that capital requirement would reduce banks' intermediary role in the economy by reducing banks' loans and the economy's output. Thus, the studies argue that there is a trade-off between a sound financial system backed by highly capitalized banks and the intermediary role of banking in the economy. One of the central bank's roles is to maintain economic stability. This stability has to be supported by stability in the financial system.

It is interesting to note that not all researchers agree that enhanced capital requirements have resulted in banks reducing their lending. A number of studies have found contradictory evidence as regards the effects of minimum capital requirements on bank credit. These studies include Peltzman (1970), Shrieves and Dahl (1992), Keeley (1988), Wall and Peterson (1987, 1995), Jacques and Nigro (1997), Aggarwal and Jacques (1997), and Rime (2001). The conclusion from these studies is that in the short-term banks mainly respond to enhanced regulatory capital by reducing lending and that there is little conclusive evidence to suggest that capital regulation has forced banks to maintain higher levels of capital than they otherwise would choose if unregulated. In the same vein, Ashcraft (2001) finds little supporting evidence that the requirement for more capital during the 1980s resulted in the banks adjusting their capital structures. In contrast to the Peek and Rosengren work, using the Monti Klein Model, Pausch and Welzel (2002) show that the capital requirement does not have any effects on bank deposits.

When he analyzed the effects of increased minimum capital requirements on interest rate spreads in the USA, Elliot (2009, 2010) observed that the effects are small, especially if banks are able to offset any increase in funding costs by other means. In support of the above argument, Kashyap, Stein and Hanson (2010), also conclude that the long run costs of increasing capital requirements are likely to be small. They base their argument on the Modigliani-Miller (1958) theorem. They argue that the proposition appears to describe quite well the empirical relationship between a bank's return on equity and its level of debt. In their study of the USA banks, they conclude that a 4% increase in the ratio of equity in the capital structure would lead in the long run to a 10% basis point increase in bank's funding costs if tax effects are the only departure from Modigliani-Miller, rising only up to 18 basis points if further possible departures are considered.

In their study of the Spanish commercial banks for the period 1985 to 1991, Barrios and Blanco (2003), concluded that capital requirements did not affect the behaviors of banks during the period of study. More so, in their study of the impact of Basel 1 on the credit slowdown in Latin America, Barajas, Chami, and Cosimano (2005) find little evidence that either the loan-asset ratio or the average growth rates of loans declined after Basel I adoption.

III. Methodology and Data Sources

We applied the panel data framework to investigate the relationship between capital requirements and bank performance in Zimbabwe. The use of panel data enhanced the study by increasing the number of observations given that data on the Zimbabwean banks is not available to allow cross sectional analysis.

Panel data has the advantage that it captures the unobserved bank characteristics hence reduces bias of estimates. Semi-annual data related to the main banks in Zimbabwe (14 banks) was collected over the period 2009-2013. Semiannual micro data used in the empirical work was collected from annual financial reports of each selected bank. The study applied filtering rules to eliminate three banks with non-representative data, and out of 21 banks in Zimbabwe only 14 banks were analyzed. The People's Own Savings Bank was not considered for analysis since it is not subject to minimum capital requirements. Tetrad Bank and Steward Bank were excluded from the analysis because their reporting period was not in line with other banks. We also decided not to analyze separately those building societies which are subsidiaries of holding banks. We think that a consolidated approach better reflects the relationship between capital requirements and performance in a complex banking group. This is consistent with Houston, James and Marcus (1997) who found that shocks to one subsidiary in a holding company are partially transmitted to other subsidiaries in the banking group. The study used semiannual data obtained from the Reserve Bank of Zimbabwe, Zimbabwe National Statistical Agency (ZIMSTAT) and Zimbabwe Stock Exchange.

In our model, bank performance (Bp_{it}) is taken to be a function of capitalization levels, market share, profit for the previous period, market concentration, bank size, inflation, interest rates, non-performing loans, management efficiency, cost efficiency, implicit cost and industrial performance. Thus, to empirically determine the relationship between minimum capital requirements and banks' performance we specify our model following Gilbert, (1984), Michael and Smirlock (1985), Molneux and Forbes (1995), and Maudos (1998), as shown below:

$$Bp_{it} = \beta_0 + \beta_1 C_{it} + \beta_2 MktS_{it} + \beta_3 Inf_{it} + \beta_4 Int_{it} + \beta_5 Prov_{it} + \beta_6 CosEff_{it} + \beta_7 Impl_{it} + \beta_8 IndPer_{it} + \beta_9 Bsize_{it} + \beta_{10} ManEff_{it} + \beta_{11} Mcon_{it} + \beta_{12} Roe_{it} + \mu_{it}$$

where Bp_{it} is bank performance and $Bsize_{it}$ represents natural logarithm of Total Assets of each bank. C_{it} captures capitalization levels, while $MktS_{it}$ measures market share, Inf_{it} represent the price index and Int_{it} represents interest rate spread. Furthermore, $Prov_{it}$ accounts for non-performing loans, $CosEff_{it}$ represents cost efficiency, $Impl_{it}$ represents implicit costs, $IndPer_{it}$ represents company performance (industrial index), $ManEff_{it}$ represents management efficiency, $Mcon_{it}$ represents market concentration and Roe_{it} represents profit for previous period. Considering the popularity of Return on Assets (ROA) in empirical literature as a proxy for bank performance and the weaknesses of Return on Equity (ROE) as highlighted by Dietrich and Wanzenried (2011), ROA was used in this study as a proxy for banks' performance. The study further preferred the use of ROA as it had been more stable than ROE over the period of our analysis. The Zimbabwean banking crisis that occurred in 2004 also indicates that ROE is not a good indicator in detecting between good and bad bank performers.

We measure Implicit cost ($Impl_{it}$) as non-interest expenses relative to non-interest revenues. We postulate that higher implicit costs are likely to reduce profit. We define market share ($MktS_{it}$) as the proportion of each bank's deposits as a proportion of total sector's deposits. A positive association between market share and profitability has been demonstrated empirically in several cross-sectional studies, most notably in the study by Buzzell et al (1975). Bank Size ($Bsize_{it}$) is measured by the natural log of the total assets of each bank.

Large banks are better placed than smaller banks in harnessing economies of scale in doing business and they will tend to enjoy higher levels of profits. Consequently, a positive relationship is expected between size and profits. Molyneux and Thornton (1992), Bikker and Hu (2002) and Goddard et al. (2004) find that size is positively related to profitability. Market concentration is defined by the total of deposits of the three largest banks in the economy expressed as a percentage of the total deposits for all the banks. When market share is concentrated in a few firms there is a tendency for collusive behavior and as a result the firms will charge high prices and profitability will increase. A number of studies (Weiss, 1974; Bailey, 2007) have found a positive relationship between market concentration and profitability of firms.

Capital ratio in our study was computed by dividing the capitalization level by total assets. It is anticipated that higher capital level breeds higher profitability level since by having more capital, a bank can easily adhere to regulatory capital standards so that excess capital can be provided as loans (see, Berger, 1995). We also used profits for the previous periods and postulate a positive correlation with banks' performance. Another important variable used was management efficiency which is the ratio of earning assets to total assets. We anticipate a positive relationship between management efficiency and profitability. We also consider the loans' provision ratio and expect it to be negative and statistically significant, as banks reduce their lending when future losses are likely to be higher to build up the capital buffer and absorb eventual losses.

We also include macroeconomic variables to control for the effect of external factors on the performance of banks in Zimbabwe namely: inflation, growth in GDP and interest rates. Inflation does not only reduce the incentives to increase savings but also decreases demand for credit and, therefore bank profits. We proxy growth in GDP by the industrial index and we anticipate a positive relationship. As industries are doing well the demand for credit will increase, therefore bank profits. Lastly, we use the interest rate spread and postulate a positive relationship. As the gap between the savings rates and lending rates widens, the margins of banks will increase, hence bank profits.

IV. ESTIMATION FRAMEWORK

Dynamic panel data estimation framework (one step difference GMM) was used for the purposes of this study. Capital levels among other explanatory variables in the model are likely to be endogenous hence correlated to the error term. The inclusion of the lagged value of bank performance (ROA) in the specified model introduces the problem of autocorrelation while bank specific effects may be correlated to regressors. The data set under consideration has a short time dimension ($T=5$) and a long panel dimension ($N=14$), hence the need for an estimator capable of producing consistent and efficient estimates based on this micro panel data set.

The first differences GMM estimator corrects for the above-mentioned effects. Instead of using only exogenous instruments, endogenous regressors are added. The endogenous variables are made predetermined and unrelated to the error term. The fixed effects are also removed through first differencing of the model. The lagged first difference of bank performance was instrumented by its past levels to mitigate auto-correlation. The estimator was also designed to produce consistent and efficient estimates based on micro-panel data sets.

Pearson's correlation coefficient was used to detect multicollinearity among variables in the model before estimation was done. The study noted that there was strong correlation between the price index and interest rate spread as well as price index and capital levels and the performance of banks. Given

that the sample size and time frame where data was available are fixed, it was not possible to increase panel data as a mechanism to reduce the effects of multicollinearity. In estimation various models including and excluding one of the correlated variables were assessed focusing on specification bias. The most parsimonious results are reported.

V. PRESENTATION AND DISCUSSION OF EMPIRICAL RESULTS

The estimated results are as presented in Table 1 below. Estimated results indicate that bank size and implicit costs are significant variables explaining bank performance in Zimbabwe. The overall model was found to be statistically significant at 1% level ($F=5.29$). In addition, the Sargan test for overidentifying restrictions shows that they are valid.

Table 1: Dynamic panel-data estimation, one-step difference GMM; Dependent Variable Return on Assets (ROA)

Variable	Coef.	Std. Err.	T	P> t	[95% Interval]	Conf.
capade	0.0704	0.219047	0.32	0.749	-0.3669	0.5077
bsize	0.0918	0.034629	2.65	0.01	0.0226	0.1609
prov	-0.1803	0.240131	-0.75	0.455	-0.6597	0.2991
impl	-0.0179	0.007329	-2.44	0.017	-0.0325	-0.0032

The capital adequacy variable (cap) has a positive but statistically insignificant effect on bank performance. The intuition that a well-capitalized bank can easily adhere to regulatory capital standards so that excess capital can be provided as loans as argued by Berger in 1995 is not supported by our evidence. This finding is in discordance with those of Demirguc, -Kunt and Huizinga (1999), Ben Naceur and Goaied (2003), Kosmidou, Tanna, and Pasiouras (2005), indicating that well capitalized banks face lower costs of going bankrupt which facilitates a reduction in the cost of funding.

The results show that the coefficient for bank size (Bsize) is positive and statistically significant. This is in line with Molyneux and Thornton (1992), Bikker and Hu (2002) and Goddard et al. (2004) who find that bank size is positively related to profitability. Big banks can leverage on economies of scale to increase market share thereby achieve higher profitability.

Consistent with our intuition, higher implicit cost (non-interest cost relative to non-interest revenue) has a negative and statistically significant effect on return on assets. It is important to note that implicit cost is not supported by depositors' funds; instead, shareholders' profits absorb the additional cost of ensuring that banks increase their non-funded revenues.

Consistent with other studies, e.g. by (Ghosh *et al* (2003), Weber and Kleff (2004), that reported no relationship between provisions and profitability, the estimate of loan provisions (prov) is negative and statistically insignificant at 5% level of significance implying that there is no relationship between provisions and bank performance.

Variables such as market share, market concentration, management efficiency, cost efficiency, interest rate spread and industrial performance were found to be statistically insignificant and were dropped from the model to get a parsimonious model. The lagged value of bank performance was dropped from the model since it was introducing co-linearity signifying that instruments used were weak.

Although bank size was found to be statistically significant, the coefficient of market share (mktshr) is not statistically significant. The reasoning is that even though a bank can enjoy increased demand for its products, the increased demand will not translate into increased market share. The commonly held view is that when demand for products increases it should follow that market share will follow suit. Thus, the finding of no statistically significant relationship between the two in our study is not surprising. A possible explanation for such a finding may be the way the two variables are defined. While bank size measures absolute presence of a bank in the sector, market share refers to its relative position. In that regard when bank size of other banks in the sector also increases, market share of an individual bank may not necessarily increase, despite the rise in its own size.

Despite the fact that the study observed high market concentration in the banking sector, this did not translate into higher profits because there was no collusive behavior in the sector as competition for clients was high hence low margins during the period under review. Thus, the model results revealed that market concentration was insignificant.

Interest rate spread was found to be insignificant notwithstanding the fact that banks should survive on interest income based on their lending activities. The period under review was characterized by high non-performing loans hence banks were forced to reduce their lending hence interest income was reduced regardless of interest rate spread. More so, inflation was found to be insignificant during the period under review. The result was expected since for the period between 2009 and 2013, the Zimbabwean economy enjoyed the lowest inflation levels in its history. The level of inflation experienced thus could not be used as a decision-making variable during the period under review.

The growth in GDP was found to be insignificant in terms of explaining the performance of banks during the period under review. This can be explained by the fact that even though the capacity utilization was very low, the industrial index (our proxy for GDP growth) was increasing. In this regard, the stock market defied economic fundamentals hence industrial performance was found to be insignificant.

VI. CONCLUSION AND POLICY RECOMMENDATIONS

There is no significant relationship between capital levels of banks and their performance. While market share is not a significant variable in determining banks' performance, bank size is positive and statistically significant. Large banks are in a position to leverage on economies of scale hence offer competitive products and services to customers with the end result being increased profitability. The increase in implicit costs contributed negatively to the performance of banks for the period under study partly because the period was characterized by "de facto" controls on the fees and commissions that banks could charge which resulted in non-funded income decreasing while non-interest expenses were increasing.

Increasing regulatory capital requirement for banks may not ensure viability of the banking sector. Policy should focus on other non-capital regulatory requirements that would foster banks' performance. Regulatory capital should not be uniform across banks of different sizes. To improve banking sector

profitability and stability it is recommended that monetary authorities should base the regulatory capital on the proportion of risky assets in the bank's balance sheet.

Generally, it is agreed that regulatory capital is an important variable in terms of policy and what remains is for monetary authorities to decide how best to utilize this variable in order to improve banking sector profitability and stability. Based on the above findings, we recommend that monetary authorities should focus on non-capital regulations as complementary to capital regulations in efforts to improve banks' performance.

Even though bank size improves financial performance, it should also be ensured that the banks do not use their market power to charge monopoly prices for services. In that regard efforts should be made to encourage the banks to emphasize on enhancing efficiency to improve their financial performance.

REFERENCES

Aggarwal, R. and Jacques, K. (1997), "A Simultaneous Equations Estimation of the Impact of Prompt Corrective Action on Bank Capital and Risk," Federal Reserve Bank of New Economic Policy Review, pp. 23–32.

Agoraki M., Delis, M. and Pasiouras, F. (2011), "Regulation, Competition and Bank Risk Taking in Transition Countries," *Journal of Financial Stability*, Vol. 7, pp. 38-48

Angelini, P. and Cetorelli, N. (2003), "The Effects of Regulatory Reform on Competition in the Banking Industry," *Journal of Money, Credit and Banking*, Vol. 35, No. 5, pp. 663-684

Ashcraft, A. (2001) "New Evidence on the Lending Channel," Staff Reports 136, Federal Reserve Bank of New York.

Bailey, A. S. (2007). Investigating the Market-Structure - Performance Relationship in the Commercial Banking Sector: Evidence from Jamaica. Bank of Jamaica. Accessed from http://boj.org.jm/uploads/pdf/papers_pamphlets/papers_pamphlets_Investigating_the_MarketStructure_Performance_Relationship_in_the_Commercial_Banking_Sector__Evidence_from_Jamaica.pdf.

Retrieved on 2/05/2015

Barajas, A., Chami, R. and Cosimano, T. (2005), "Did the Basel Accord Cause a Credit Slowdown in Latin America?" IMF Working Paper, WP/05/38, Washington: International Monetary Fund.

Barrios, V. E. and Blanco, J. M. (2003), "The Effectiveness of Capital Adequacy Regulation: A Theoretical and Empirical Approach", *Journal of Banking and Finance*, Vol. 27, pp. 1935-1958.

- Ben N. S. and Goaid, M. (2003), "The Determinants of Commercial Bank Interest Margin and Profitability: Evidence from Tunisia", *Under Review at the Journal of Frontiers in Economics and Finance* Vol.5, No. 1, pp 106-130.
- Berger, A. N. (1995), "The Profit-Structure Relationship in Banking: Tests of Market- Power and Efficient-Structure Hypotheses", *Journal of Money, Credit and Banking*. 27(2), pp. 404-431.
- Bernanke, B. (2009), Letter to the U.S. Senator Corker,
[http://blogs.wsj.com/economics/2009/11/18/bernanke-offers-broad-definition-of](http://blogs.wsj.com/economics/2009/11/18/bernanke-offers-broad-definition-of-systemic-risk) systemic-risk.
- Bikker, J. and Hu, H. (2002), "Cyclical Patterns in Profits, Provisioning and Lending of Banks and Procyclicality of the New Basel Capital Requirements", *Banca Nazionale del Lavoro Quarterly Review*, 143–175
- Blum, J. and Hellwig, M. (1995), "The Macroeconomic Implications of Capital Adequacy Requirements for Banks," *European Economic Review Vol 39 pp 739-49*
- Bolt, W. and Tieman, A. (2004), "Banking Competition, Risk, and Regulation," IMF Working Paper 4/11
- Buzzell, R. D., Gale, B.T. and Sultan, R.G.M. (1975) "Market Share-A Key to Profitability", Harvard Business Review, Vol. 53, No. 1
- Chiuri, M. C. Ferri, G. and Majnoni, G. (2001), "The Macroeconomic Impact of Bank Capital Requirements in Emerging Economies: Past Evidence to Assess the Future," Policy Research Working Paper Series 2605, The World Bank.
- Chiuri, M. C., Feeri, G. and Majnoni, G. (2002), "The Macroeconomic Impact of Bank Capital Requirements in Emerging Economies: Past Evidence to Assess the Future," *Journal of Banking and Finance, Vol. 26, 881–904.*
- Demerguç-Kunt, A. and Huizinga, H. (1999), "Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence," *World Bank Economic Review*. Vol.13: 379-408.
- Demirguc, -Kunt, A., Laeven, L. and Levine, R. (2003), "The Impact of Bank Regulations, Concentration, and Institutions on Bank Margins," World Bank Development Research Group.
- Diamond, D. W. and Rajan, R. G. (2000), "A Theory of Bank Capital," *Journal of Finance*, 55, pp. 2431–65.
- Dietrich, A. and Wanzenried, G., (2011) "Determinants of Bank Profitability Before and During the

Crisis: Evidence from Switzerland”, *Journal of International Financial Markets, Institutions and Money*, 2, 307–327

Elliot, D. J. (2009), “Quantifying the Effects of Lending on Increased Capital Requirements”, Pew Financial Reform Project, Briefing Paper No. 7.

Elliot, D. J. (2010), “A Further Exploration of Bank Capital Requirements: Effects of Competition from other Financial Sectors and Effects of Size of Bank or Borrower and of Loan Type,” The Brookings

Institution

Furfine, C. (2001), “Bank Portfolio Allocation: The Impact of Capital Requirements, Regulatory Monitoring and Economic Conditions,” *Journal of Financial Services Research* 20, pp. 33–56.

Ghosh, A., Aghion, P., Ranciere, R. and Rogoff, K. (2003), “Exchange Rate Volatility and Productivity Growth: The Role of Financial Development”, *Journal of Monetary Economics* 56(2009), pp. 494-513

Goddard, J., Liu, H. Molyneux, P. and Wilson, J., (2004), “Do Bank Profits Converge?”, Working Paper, Golin (2001).

Gunadi, I., Deriantino, E. and Budiman, A. (2011), “Increasing Banking Capital for Promoting Financial Stability and Banking Response to Monetary Policy: Evidence from Indonesia,” Paper Presented on Bank Indonesia Financial Stability Research Seminar, 19 December 2011.

Hoggarth, G. and Saorta, V. (2001), “Costs of Banking System Instability: Some Empirical Evidence,” *Financial Stability Review*, 148-165.

Honohan, P. and Klingebiel, D. (2000), “Controlling fiscal costs of banking crises”, World Bank working paper 516/05

Houston, J., James, C. and Marcus, D. (1997), “Capital Market Frictions and the Role of Internal Capital Markets in Banking”, *Journal of Monetary Economics*, 35, 389-411.

Jacques, K. and Nigro, P. (1997), “Risk-Based Capital, Portfolio Risk and Bank Capital a Simultaneous Equations Approach”, *Journal of Economics and Business*, 49, 533–547.

Kamau A., Karingi, S., Ndung’u N., and Mwaura, S. (2004), “Capital Requirements and Bank Behaviour in Kenya: Empirical Evidence,” KIPPRA Discussion Paper No. 36.

Kashyap, A. K., Stein, J.C. and Hanson, S. (2010), “An Analysis of the Impact of Substantially

- Heightened Capital Requirements on Large Institutions,” Working Paper, University of Chicago, Booth School of Business and Harvard University.
- Keeley, M. C. (1988), “Deposit Insurance, Risk and Market Power in Banking,” *American Economic Review*, Vol. 80(5), pp 1183–1200.
- Kosmidou, K., Tanna, S. and Pasiouras, F. (2005), “Determinants of Profitability of Domestic UK Commercial Banks: Panel Evidence from the Period 1995-2002”, Money Macro and Finance (MMF) Research Group Conference 2005.
- Lin, L., Penm, H., Garg, C. and Chang, C. S. (2005), “Risk Based Capital Adequacy in Assessing on Insolvency-Risk and Financial Performance in Taiwan’s Banking Industry,” *Research in International Business and Finance*, 19, 111-153
- Modigliani, F. and Miller, M. (1958), “The Cost of Capital, Corporation Finance and Theory of Investment,” *American Economic Review*, 48, 261-97.
- Molyneux, P. and Thornton, J. (1992), “Determinants of European Bank Profitability: A Note”, *Journal of Banking and Finance* 16 (6), 1173–1178.
- Monetary Policy Statement (2012), Reserve Bank of Zimbabwe.
- Naceur, S. and Kandil, M. (2009), “The Impact of Capital Requirements on Banks’ Cost of Intermediation and Performance: The Case of Egypt,” *Journal of Economics and Business* Vol. 61 pp. 70–89.
- Pausch, T. and Welzel, P. (2002), “Credit Risk and the Role of Adequacy Regulation” Institute of Economics, University of Augsburg, Discussion Paper Series No. 224.
- Peek, J. and Rosengren, E. S. (1995), “The International Transmission of Financial Shocks: The Case of Japan,” *American Economic Review*, *American Economic Association*, vol. 87(4), pp. 495-505, September.
- Peltzman, S. (1970), “Capital Regulation in Commercial Banking and its Relation to Portfolio Regulation,” *Journal of Political Economy*, 78, 1–26.
- Rime, B. (2001), “Capital Requirements and Bank Behaviour: Empirical Evidence for Switzerland,” Swiss National Bank.
- Shrieves, R. E. and Dahl, D. (1992), “The Impact of Regulation on Bank Equity Infusions,” *Journal of Banking and Finance*, 16, 439–457.

- Van Roy, P. (2003), “Impact of the 1988 Basel Accord on Banks’ Capital Ratios and Credit Risk Taking: An International Study,” European Centre for Advanced Research in Economics and Statistics, Universite Libre de Bruxelles, Working Paper.
- Wall, L. D. and Peterson, D. R. (1987), “The Effect of Capital Adequacy Guidelines on Large Bank Holding Companies,” *Journal of Banking and Finance*, 11, 581–600.
- Wall, L. D. and Peterson, D. R. (1995), “Bank Holding Company Capital Targets in the Early 1990s: The Regulators Versus the Markets. *Journal of Banking and Finance*, 19, 563–600.
- Weber, M. and Kleff, V. (2008), “How do Banks Determine Capital?: Evidence from Germany”, Germany Economic Review, Vol. 9. 2008, 3, pp 354-372
- Weiss, L. (1974), “The Concentration-Profits Relationship and Antitrust. In Audretsch, D., Yamawaki, H., (eds), *Industrial Concentration: The New Learning*”, Boston: Little Brown and Company.
- Wellink, N. (2011), “Basel III: A Roadmap to Better Banking Regulation and Supervision”, Remarks at the FSI High-Level Meeting on the New Framework to Strengthen Financial Stability and Regulatory Priorities, St. Petersburg, Russia, 24 May 2011.
- Wooldridge, J. M. (2005), “Simple Solutions to the Initial Conditions Problem in Dynamic, Nonlinear Panel Data Models with Unobserved Heterogeneity”, *Journal of Applied Econometrics*, Vol. 20, No. 1, pp. 39-54
- Yudistira, D. (2003), “The Impact of Bank Capital Requirements in Indonesia,” Department of Economics, Loughborough University, United Kingdom