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Credit cycle and balancing the capital gap: Evidence from Korea

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ABSTRACT

This paper examines balance sheet adjustments of a banking sector due to credit cycles using data from national and regional banks in South Korea, which is a leading emerging market. Specifically, banks' target capital ratios are estimated and compared with actual capital ratios to identify capital gaps, and the responses to the gaps are then analyzed using a panel model. The empirical results show that the expansion of the credit-to-GDP gap increases the target capital, hence reducing the capital gap. Additionally, changes in the capital gap impact banks' asset compositions and managerial behaviors. A decrease in the capital gap lowers the growth rate of total assets, risk-weighted assets, and loan obligations, but increases the growth rate of core capital relative to risky assets by a higher degree than that of the risk-weighted assets itself. Similar results are shown in various cases using other popular indicators as predictor variables for credit cycles.

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1. Introduction

Banks have long been subject to regulations regarding their roles in credit provision and the payment system. Notably, regulations on core capital are primarily intended to safeguard a bank's capacity to survive and recover from unexpected losses. However, from the banks' perspective, core capital serves as a potential source of profits and the regulation of core capital in pursuit of financial stability may have detrimental effects on profitability and hence the financial soundness of the bank (Basel Committee on Banking Supervision (BCBS, 2010)). To compromise the conflicting microeconomic and macroeconomic interests that arise from regulations on core capital, Basel II accepts the banks' internal models on risk-weighted assets (RWA) and approves quasi-capital as regulatory capital along with common shares. However, continued support for the financial liberalization of major banks and developments in financial instruments that bypass regulations have vitiated the intensity of regulations. Macroeconomic policies based on credit, which emphasized the imperfect substitution of bank loans on macroeconomic performance, took a conciliatory stance toward regulations on core capital and helped develop the perception of the fundamental role of core capital in financial stability. This elevated the level of instability in the financial markets by allowing excessive risk-taking fueled by financial innovations.[1]

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[1] Adrian and Shin (2008) state that, historically, banks retain core capital matching their desired level of leverage and adjust their capital adequacy ratio (CAR) by reducing loans should external shocks occur that negatively affect core capital.

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The bankruptcy of Lehman Brothers in September 2008 and the subsequent global financial crisis served as a critical lesson on the importance of understanding systemic risk[2] and macro-prudential supervision. Discussions on establishing sound financial systems and strengthening the banking sector became widespread. One of the main topics was how to structure regulations on core capital. International discussions on recovering from and preventing another financial crisis unanimously emphasized the urgent need for the prevention and supervision of systemic risk and the development of macro-prudential policies to suppress its spread. Consequently, revisions to the regulations of the financial institutions' pro-cyclical management behavior and their contributions to credit cycles were discussed among the Group of Twenty (G20) nations, and stricter capital and liquidity regulation standards, known as Basel III, were announced. Basel III introduced new regulations on leverage ratios and liquidity, and incorporated a counter-cyclical capital buffer (CCCB) to manage the stability of financial institutions despite credit cycles.[3]

The literature discusses the impacts of stricter capital regulations on the bank capital channel and predicts that the introduction of capital requirements tends to amplify the effects of monetary and other exogenous shocks. Contrary to Modigliani and Miller's predictions, changes in capital regulations can affect the financial behavior of banks and impact various factors such as asset composition and the size of outstanding loans. This process ultimately affects macroeconomic variables such as aggregate output, inflation, and unemployment rates. Bernanke's (1983) credit view is in line with this explanation.[4] To explain the relationship between bank capital and the real economy, the sensitivity of banks' capital and changes in their balance sheets in response to modifications in capital regulations must be analyzed.

A group of researchers explain that capital regulations may not be significant, since the actual capital adequacy ratio (CAR) pursued by banks is higher than that required by Basel II. Berger and Udell (1994) suggest that the incorporation of capital regulations did not significantly impact the credit crunch in the United States in 1990–1991. Wagster (1999) analyzes data from Germany, Japan, and the United States and remarks that reductions in loans by banks are affected to a greater extent by factors other than capital regulations. Barajas et al. (2004) show similar results from Latin American countries and conclude that capital regulations have less impact on credit supply. Countering these results, Jackson et al. (1999) state that these researchers only observe banks with CARs that had already converged to the level defined by the regulatory capital and do not separate this impact from regulations and market reactions.

Another strand of the literature claims that capital regulation has a significant impact on banks' capital and lending practices. It focuses on the relative effect of capital regulation on banks' lending and portfolio composition. Jackson et al. (1999) conjecture that banks respond to stricter capital regulations by reducing lending in the short run, despite a lack of empirical evidence. Furfine (2001) presents a dynamic model of bank asset and liability management with capital adequacy regulation and claims that capital regulations have had major effects on the composition of banks' balance sheets. He attributes the decline in bank lending in the early 1990s to stricter capital adequacy regulations. Van den Heuvel (2009) proposes a model for generating a bank capital channel, wherein the monetary policy affects the supply of bank loans and asset investment through its impact on bank capital. He stresses that the strength of this channel depends on the capital adequacy of the banking sector. VanHoose (2008) states that banks respond to capital regulations by reducing lending in the short run and expanding bank capital in the long run. Francis and Osborne (2009, 2010) define banks' target capital and claim that capital regulations are crucial in deriving the target capital ratio (TCR) as a 1% difference between the actual capital and the target capital to increase the total assets and RWA by 0.06 and 0.1 percentage points, respectively. Finally, the authors emphasize the importance of capital regulation in the operation of the bank capital channel.

Employing Korean bank data, this paper uses the model suggested by Francis and Osborne to investigate if the bank capital channel works in Korea. In contrast to Francis and Osborne's model, which examines the effects of changes in capital regulation on a bank's internal capital ratio sensitivity and balance sheet composition, this paper examines the impact of the credit-to-GDP gap on banks' target capital ratios, lending, and asset allocation. The bank lending channel thesis, which states that the monetary policy affects the real economy through a direct effect on the bank lending supply, has been dismissed, as banks can switch their financing sources fairly easily, and hence this channel is downplayed in the transmission of monetary policy (Romer and Romer, 1990). However, according to the bank capital channel mechanism, monetary policy actions can affect the provision of bank credit through their impact on bank capital. Theoretical debates are not helpful in deciding which channel is more dominant, as both cases are successfully made in the literature. Hence, this issue can only be tackled by an empirical examination to help us understand which channel is more relevant in a specific economy. The earlier literature on

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[1] Adrian and Shin (2008) state that, historically, banks retain core capital matching their desired level of leverage and adjust their capital adequacy ratio (CAR) by reducing loans should external shocks occur that negatively affect core capital.

[2] In their report to the Group of Twenty's (G20) finance ministers and central bank governors, the Bank of International Settlements (BIS), the International Monetary Fund (IMF), and the Financial Stability Board (FSB) (2009) define systemic risk as "a risk of disruption to financial services that is caused by an impairment of all or parts of the financial system and has the potential to have serious negative consequences for the real economy." Professor Cochrane at the University of Chicago defines systemic risks simply as risk-prone contracts with externalities in his blog.

[3] Basel II failed to detect on- and off-balance sheet risks and the uncontrolled exposure to derivatives trading that contributed to the financial crisis. To make up for these shortfalls, Basel III acknowledges the credit risks underlying over-the-counter derivatives, strengthens counterparty credit risk, and reduces reliance on third party credit ratings by enhancing the transparency of rating agencies through mandatory public announcements.

[4] Bernanke (1983) focuses on the operations of bank lending channels in response to policy rate changes.

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