

# Countercyclical Capital Regulation: Should Bank Regulators Use Rules or Discretion?

By Michał Kowalik

One of the key features of the U.S. economy's slow recovery from the 2007-09 recession has been abnormally low bank lending to households and corporate businesses. Although demand for loans may be sluggish, much of the slowdown may stem from banks' reluctance to lend. Before resuming normal lending activity, banks must first replenish capital levels that were depleted during the financial crisis.

Many analysts have pointed out that existing bank capital regulation can contribute to banks' reluctance to lend during recessions and into recoveries. That is, the capital requirements have a *procyclical effect* on lending. They make it more difficult for banks to finance loans in recessions when loans would help stimulate the economy.

In response to this problem, the Dodd-Frank Financial Reform and Consumer Protection Act of 2010 (Dodd-Frank) and the recent revision of the international Basel Accord, Basel III, mandated changes to make capital requirements countercyclical. The changes should counteract the procyclical effect of capital regulation by requiring banks to hold higher capital ratios during booms. Thus, during downturns,

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banks would be in a better position to absorb rising losses and sustain lending to support economic growth.

Whether countercyclical capital requirements will provide more lending in recessions depends on *how* they are implemented. Yet, little discussion among policymakers has focused on implementation.

This article examines the primary options for implementing countercyclical capital requirements: using a fixed rule or giving the regulatory authorities discretion in deciding when and how to act. The first section discusses current capital regulation. The second section discusses the rationale for countercyclical capital requirements. The third section discusses the pros and cons of the rule- and discretion-based approaches to implementing the requirements. The analysis finds that the rule-based approach has more advantages than the approach based on discretion.

## I. BANK CAPITAL REGULATION

Banks fund their investments using deposits, other forms of debt, and equity capital. However, banks tend to hold little equity, which endangers the deposit insurance system. Ensuring that banks hold adequate amounts of equity capital is one of the primary tools bank regulators use to ensure the safety and soundness of individual banks.

### *Why is bank capital regulated?*

Banks have long played a special role in the financial system: They provide liquidity, credit, and payment services to households and firms.<sup>1</sup> Banks borrow funds from households and firms in the form of short-term and demandable deposits (used as a storage and payment facility). They channel these funds in the form of long-term loans and lines of credit to other households and firms that need funds for consumption and investment.<sup>2</sup>

In addition to deposits, banks use equity capital to finance loans and to serve as a cushion to absorb loan losses. When a bank's loans pay less than the value of their principal, equity capital absorbs the losses (up to its level). A bank could be made totally safe by financing itself with equity alone. However, such financing would eliminate the bank's ability to provide payment and liquidity services.

Banks have a tendency to hold little equity.<sup>3</sup> Their special functions of providing credit, liquidity, and payments services may require them to favor deposits and hold less equity than nonfinancial firms (Diamond; Gorton and Pennacchi; Kashyap and others).<sup>4</sup> Banks also have an incentive to hold less equity because their deposits are at least partly insured, and the deposit insurance premiums underprice the bank's likelihood of default (Admati and others; Berger and others; Hellwig). With thin capital cushions, banks not only are susceptible to default, they may also find it profitable to engage in risky activities because they have little "skin in the game." Overall, the higher risk-taking of banks is borne by the deposit insurer, which is ultimately liable for the insured deposits of failed banks.

The tendency for banks to shift the burden of repayment to the deposit insurance entity creates a need for regulation to protect the deposit insurance system. Regulatory efforts focus on the safety and soundness of individual banks by ensuring that they hold adequate equity capital. Thus, the micro-prudential regulation of bank capital provides a capital cushion protecting the depositors and the deposit insurance fund.<sup>5</sup>

### *Current framework for micro-prudential bank capital regulation*

Bank capital is usually regulated by requiring banks to meet or exceed a minimum capital requirement, which is specified by ratios of various measures of capital to assets. The predominant forms of capital are common equity; other equity instruments, such as some types of preferred stock; and hybrid securities that have both equity and debt features, such as subordinated debt and contingent capital (convertible bonds). Initially, capital requirements were based on a bank's total assets, but since the late 1980s, they have been based on the level and riskiness of a bank's assets.

The current framework for micro-prudential bank capital regulation in the United States was specified in the 1991 Federal Deposit Insurance Corporation Improvement Act (FDICIA). FDICIA was based on the first international accord issued by the Basel Committee for Banking Supervision in 1988. The key feature of Basel I was the use of risk-based capital requirements that sought to align a bank's capital with the credit-riskiness of its assets. Under Basel I, a bank was

adequately capitalized if its ratio of capital to risk-weighted assets exceeded a threshold of 8 percent.<sup>6</sup>

Risk-weighted assets are calculated by assigning all assets to one of four different risk categories, each of which has a specified risk weight. For example, cash and U.S. government bonds are classified as riskless. With a risk weight of zero, they are excluded from total risk-weighted assets. At the other extreme, loans made to businesses are assigned the riskiest category with a 100 percent weight.

In addition to setting minimum capital ratios, the federal banking supervisors have the discretion to require banks to hold more than the minimum requirements. Because bank supervisors are concerned with the overall safety and soundness of a bank, they could require a bank to increase its capital ratio above the minimum based on other risk factors discovered as part of the supervisory process, such as high concentrations of loans to a specific sector of the economy. Such actions often occur in recessions, when loans and other assets become riskier.

In 2004, the Basel Committee for Banking Supervision agreed on an overhaul of Basel I. Basel II was based on the assumption that increasingly sophisticated methods of quantifying credit risk by banks could be used to determine their regulatory capital requirements. The new minimum capital requirements allowed banks with more complex balance sheets to replace the standard, fixed-risk weights of Basel I with weights based on the banks' internal risk management models. The goal was for the capital requirements to better reflect the riskiness of banks by tying risk to individual assets rather than a category of assets.<sup>7</sup>

## II. A CASE FOR COUNTERCYCLICAL CAPITAL REQUIREMENTS

Micro-prudential capital regulation, with its focus on the safety and soundness of individual banks, has a potential to amplify business cycles. A direct remedy for this unintended consequence is to introduce countercyclical capital requirements.

### *The procyclicality of micro-prudential capital regulation*

A key feature of the recent financial and economic crisis was a sharp decline in credit, which was preceded by a period of extraordinarily strong credit growth. Although this volatile lending pattern had many

causes, it provided support for a long-held view of many analysts and bank regulators that micro-prudential regulation of bank capital may have a procyclical effect on the business cycle—that is, capital regulation may contribute to amplification of the business cycle by magnifying or even inducing so-called “credit crunches” in recessions. A crunch in bank credit occurs when bank lending falls due to a decrease in the supply of loans unrelated to factors such as changes in risk-free interest rates or the credit quality of borrowers (Bernanke and Lown).

One way banks may comply with regulatory capital requirements in recessions is to decrease the supply of new loans (to new or existing borrowers). When bank loan losses start to mount, banks’ profits and equity levels decrease, thus lowering capital ratios. Equity levels may fall so low that banks would not be able to meet their capital requirements if they made new loans. Therefore, rather than breach their capital requirements, banks decrease the supply of new loans. However, denying credit to otherwise-creditworthy borrowers, who could finance additional consumption and investment, can make the recession worse.

The procyclical effect of micro-prudential capital regulation would likely amplify a recession except in two circumstances that are unlikely to exist. First, banks could enter the recession with sufficiently high capital ratios, and new lending would not endanger the banks’ ability to meet regulatory capital requirements. However, banks’ capital ratios tend to be only slightly higher than the capital requirements and thus do not provide a cushion for additional lending in a recession.<sup>8</sup> The second condition is that, if it is not too costly, banks could raise fresh, or redeploy existing, capital in a recession. But because recessions tend to affect the whole banking sector, banks may be reluctant or find it extremely hard to raise capital through new equity offerings or sales of loans and other assets.

New equity offerings may not be attractive for two reasons.<sup>9</sup> First, a bank’s share price may decline at issuance if potential new shareholders fear the bank is trying to sell new equity because it is in bad shape. In such a case, the bank may forgo the issuance of new equity (Myers and Majluf). This effect is more pronounced in a recession when the number of banks in poor health increases, and investors find it hard to distinguish between good and bad banks. Second, the bank’s shareholders may find the additional injection of equity unprofitable because it

primarily benefits the bank's creditors, whose claims become less risky after the injection of the new equity (Myers). This so-called "debt overhang problem" becomes more severe in a recession when depressed returns on a bank's investment make the new injection even less favorable for shareholders.<sup>10</sup>

Selling off existing loans and other assets also may be insufficient in a recession. In good times, banks use this strategy to redeploy their capital to new loans. However, in a recession, the prices of a bank's assets may fall to such an extent that the bank loses money on the sales, reducing equity. Asset prices may fall because the asset values are affected by the depressed economy. In addition, the more banks sell their assets, the more asset prices fall, requiring the sale of even higher volumes of assets to satisfy capital requirements, inducing a vicious cycle of falling asset prices.

The effects of capital regulation on a bank's ability to lend in a recession also depend on the regulatory capital framework and rules. Under the Basel I capital requirements, risk weights are constant over the business cycle. Thus, high losses in a recession would cause capital ratios to drop below the regulatory minima, which would impair banks' ability to lend. The negative impact on bank lending is even greater under Basel II because banks' demand for regulatory capital may be increased. The reason is that the weights used to calculate risk-based capital requirements are based on internal models or external ratings, which reflect the rising risks in recessions (Blum and Hellwig; Kashyap and Stein; Repullo and Suarez; Repullo, Saurina, and Trucharte).<sup>11</sup>

### *The argument for countercyclical capital requirements*

Countercyclical capital regulation is intended to address the problems caused by procyclical micro-prudential capital regulation. Countercyclical regulation would increase capital ratios in normal times to prepare banks for absorbing losses in recessions. It could also lower capital ratios in recessions, boosting further banks' ability to make new loans. Moreover, better capitalized banks would be more willing to raise fresh equity and would need to sell fewer assets to satisfy capital requirements in recessions.<sup>12</sup>

Countercyclical capital requirements are based on the assumption that raising bank equity capital is easier in booms than in recessions. In

booms, banks' profits provide a source of capital from retained earnings. Higher asset prices allow banks to sell their loans and other assets to reduce their exposure to assets subject to capital requirements. In good times, banks find it easier to increase their equity because uncertainty about their health declines.

Countercyclical capital requirements are one of many tools used to implement macro-prudential financial regulation, which is intended to protect the health of the financial sector as a whole as opposed to providing for the safety and soundness of individual financial companies.<sup>13</sup> Box 1 lists the recently proposed countercyclical capital requirements in Basel III.

### III. IMPLEMENTING COUNTERCYCLICAL CAPITAL REQUIREMENTS: RULES VS. DISCRETION

Whether countercyclical capital requirements can effectively address the procyclical effect of micro-prudential capital requirements depends on how they are implemented. Implementation could follow either a rule-based or discretionary approach. This section explores the strengths and weaknesses of the two approaches.

#### *Why does implementation matter?*

Countercyclical capital requirements can boost the ability of banks to lend in economic downturns. However, their impact depends on the timing and magnitude of their implementation. Timing refers to when the requirements are imposed and relaxed, and how quickly new minimum requirements must be met. Magnitude refers to how much requirements are changed. The tradeoff is that countercyclical requirements can help avoid a credit crunch in a recession, but their implementation may be costly. The costs will vary over the business cycle.

During the growth phases of the economy when countercyclical capital requirements increase required capital ratios, both the timing and magnitude matter. Adjusting to higher capital ratios is costly for banks, especially when all banks have to adjust at the same time. For that reason, banks may prefer to increase their capital ratios by curtailing their lending—which could cause a credit crunch and reduce economic growth—rather than issuing new capital or selling assets. The cost in terms of lost lending would be more pronounced if banks had little

time to adjust or the required adjustment in capital requirements were substantial. Hence, to reduce the probability of a credit crunch, the process for implementing countercyclical capital requirements must take into account the time banks need to adjust their capital ratios to the new requirement. Giving banks enough time for adjustments would allow them to do so at the lowest cost in terms of current lending.

In an economic downturn, the magnitude of countercyclical capital requirements is also important. A tradeoff exists between reducing the likelihood of credit crunches and increasing the likelihood of bank defaults. In deciding by how much the minimum capital ratio should be allowed to decline, regulators must weigh the benefits of maintaining banks' capacity to lend against the severity of the shock to the banking sector and the increased likelihood of bank defaults. If capital requirements are not decreased enough, they may fail to prevent a credit crunch. If they are decreased too much, banks' survival may be at risk.<sup>14</sup>

When deciding when to relax the countercyclical requirement, the timing has to be such that the authority understands the potential for a credit crunch. On the one hand, the timing does not matter for the banks because the downward adjustment of their capital ratios is not costly for them. On the other hand, the timing matters for the economy because waiting too long to relax the capital requirements may cause a credit crunch and depress economic activity, in which case it would be too late for an increase in bank lending to prevent a recession.

### *Evaluation criteria*

Tradeoffs will inevitably arise when choosing the timing and the magnitude of countercyclical requirements. Under a rule-based approach, the timing and magnitude choices would be made automatically using a predetermined formula. Under a discretion-based approach, the decision maker would use judgment to decide when and to what extent the requirements are needed. In deciding which approach to use, three questions should be considered: How efficiently and effectively will information be used? Will implementation cause adverse incentives? And, will there be communication problems?

*Information.* Implementing the requirements at the right time and pace and by the right amount requires extensive information on the conditions of the economy, banking sector, and capital markets. The

implementation approach should make the best use of the available information to minimize the probability of making errors when implementing and relaxing countercyclical capital requirements.

*Implementation incentives.* The approach should provide a framework that strikes the right balance between the ultimate goal and costs. In particular, because the costs are immediate and the benefits may materialize only in the future, regulators may be tempted not to implement the requirements when they are needed. Such a temptation for a decision-making authority to compromise its ultimate objective for an inconsistent goal is called the time-consistency problem.

*Communication problems.* The approach should eliminate communication problems stemming from the fact that banks and their business partners may have different information than the regulator. For example, a discretionary announcement of higher capital requirements may reveal new information to market participants that the state of the economy and banks' health is worse than they thought. Such a decline in market views may make it more difficult for banks to raise their capital ratios.

### *Discretionary approach*

In a discretionary framework, the regulator would use judgment in determining when to implement the countercyclical capital requirements and by how much. The discretionary approach has some informational advantages but is less effective at preventing regulators from delaying implementation of the requirements and may have a potential for inducing negative market reactions at implementation.

*Information.* The advantage of a discretionary approach to implementation is that the regulator is potentially able to make much greater use of all currently available information about the conditions of the banking sector, as well as the economy and capital markets. For example, the information gathered in the process of bank supervision would allow the authority to understand not only the state of individual banks but also of the banking sector as a whole. Information on the state of the economy would provide better understanding of the risks to which the banking sector is exposed. Information about the capital markets also would help the regulator understand the views of investors on the

banking sector and their capacity to provide fresh equity to banks and to absorb asset sales.

Abundant information would allow for a better assessment of the lending capacity and health of the banking sector, as well as the capital markets' ability to supply additional capital for banks in case of an adverse shock. The authority could then infer the amount of potential capital needed to prevent a credit crunch. Such knowledge would help the authority make an informed decision about the timing and magnitude of countercyclical capital requirements, in both good and bad times.

*Implementation incentives.* A discretionary approach to policymaking is subject to the time-inconsistency problem. In the case of implementing countercyclical capital requirements, the regulatory authority might avoid taking actions that would meet its objective of preventing a credit crunch in favor of meeting a more immediate objective of promoting lending in good times.<sup>15</sup>

An example helps explain the time-inconsistency problem in implementing countercyclical capital requirements. Suppose an economy has had several quarters of economic growth accompanied by a steady increase in bank lending. Economic growth has allowed the banks to achieve profits that have translated into a steady stream of additional capital employed in making new loans. The authority has gathered data indicating that the banks have been substantially increasing loans while maintaining only the minimum amount of equity capital necessary to meet the micro-prudential regulatory capital requirements.

The authority with discretionary power must decide if and when to implement countercyclical capital requirements. Although an adverse economic shock may seem remote, the authority has enough data to understand that, if such a shock were to occur, it would lead to widespread losses in the banking sector. Because banks' capital ratios are only slightly above the capital requirements, a credit crunch would be likely. Consistent with its goal of reducing the probability of a credit crunch if a recession were to occur, the authority should increase banks' capital requirements.

However, the authority may decide against raising capital requirements for several reasons. First, it may recognize that doing so may

limit banks' ability to lend, reducing economic growth in the short term. If the authority is sufficiently biased toward promoting lending in good times and recession seems remote, it may decide to delay increasing capital requirements. Second, the authority may face pressure from groups, such as politicians, that are more concerned about short-term economic growth. Third, the authority may find it hard to convince banks that higher capital requirements are necessary based only on supervisory judgment. Convincing the banks of a need to finance their assets with a higher share of equity capital may be especially hard in good times when bank profits are strong and the risk of recession seems remote (Hoenig, 2009 and 2010).<sup>16</sup>

An authority's tendency not to implement countercyclical capital requirements may also be self-reinforcing. Banks anticipating this bias may thus engage in lending and capital structure strategies consistent only with the micro-prudential capital requirements. As a result, banks' thin cushions of capital would make the authority less willing to introduce countercyclical capital requirements, because their introduction could lead to a high cost of adjusting capital ratios for banks and potentially harm their lending capacity and economic growth.

*Communication problems.* A discretionary approach may make the timing and magnitude of countercyclical capital requirements less predictable for banks and their business partners. The authority may have access to a different set of information than market participants—for example, data about the health of the economy or overall banking sector—which would be revealed indirectly only when countercyclical capital requirements were changed in a way unexpected by the market.

A decision that surprises market participants may reduce banks' ability to raise needed capital. An unexpected increase in capital requirements may suggest that the condition of the economy or the banking sector is weaker than thought, causing a downward revision of the valuation of bank assets, shares, and marketable debt. As a result, financing could become more costly for banks, precisely when they need to raise their capital ratios.<sup>17</sup>

Box 2 assesses a proposal for addressing these concerns—the so-called “constrained discretion” approach to implementation. The approach attempts to preserve the informational advantage and eliminate the disadvantages of the pure discretionary approach. The Box provides

arguments suggesting that the constrained discretion approach might not be effective.

### *Rule-based approach*

In a rule-based framework, the timing and level of countercyclical capital requirements would be tied to a certain variable or set of variables in a pre-specified formula. Capital requirements would change automatically whenever this variable (or set of variables) changes its value. Although implementing capital requirements under this approach would rely on less information than under a discretionary approach, the rule-based approach would eliminate adverse implementation incentives and the potential for negative market reactions.

*Information.* A rule determining countercyclical capital requirements needs to be simple. Critics argue, however, that a rule would not have sufficient information to determine the countercyclical capital requirements. Insufficient information in turn could lead to false signals about the need for raising or lowering countercyclical capital requirements. In fact, most of the research so far on the implementation of countercyclical capital requirements has focused on finding variables that would provide the most reliable signals for adjusting requirements (Box 3).<sup>18</sup>

*Implementation incentives.* The rule-based approach would eliminate the problem of adverse implementation incentives by explicitly stating how capital requirements should vary over the business cycle. If capital requirements are determined by a fixed rule, there is no scope for a discretionary authority to change them to achieve a different objective, such as promoting lending in good times. Hence, the rule ensures that capital requirements are always consistent with their ultimate goal of reducing the procyclicality effect of capital regulation.<sup>19</sup>

Moreover, a rule-based approach may have an added benefit. The banks themselves may engage in strategies consistent with the goal of countercyclical capital requirements. If banks anticipate future changes in capital requirements, they may take them into account in their current lending and capital structure decisions. For example, anticipating that relaxed lending and capital ratios could lead to an increase in capital requirements in the future, banks might build up cushions of equity capital to reduce the costs of adjusting capital ratios when required.<sup>20</sup>

*Communication problems.* Unlike the discretionary approach, a rule-based approach would eliminate the potential for communication problems caused by the informational content of changes in capital requirements. Although changes in capital requirements would be uncertain due to the uncertainty in the underlying variables, the changes would always be based on publicly observable information. Therefore, the changes would not contain additional information that could alter the banks' ability to raise capital.

#### **IV. CONCLUSION**

This article analyzes the pros and cons of rule-based versus discretion-based approaches to implementing the countercyclical capital requirements mandated by Dodd-Frank and Basel III. Based on this analysis, a rule-based approach would be more effective.

The two advantages of a rule-based approach are that it eliminates adverse implementation incentives and communication problems caused by a discretionary approach. First, a rule-based approach leaves no room for regulators to pursue different goals, such as promoting short-term growth. Second, by tying the countercyclical capital requirements to a pre-specified formula, any change in banks' capital requirements would not provide any new information that could harm banks' ability to raise capital when required.

A rule-based approach would use less information to determine when and by how much capital requirements need to be changed. However, regulators would use only variables that minimize the likelihood of implementation errors. Thus, although a rule-based approach would use less information to make implementation decisions, this drawback should not be significant enough to offset its other advantages. As a result, the risk of a severe credit crunch should be lower using rules.

**BOX 1****BASEL III PROPOSAL FOR IMPLEMENTING  
COUNTERCYCLICAL CAPITAL REQUIREMENTS**

In December 2010, the Basel Committee for Banking Supervision (2010) issued the final guidance for implementing countercyclical capital requirements. Listed below are the main features of the proposal:

- The countercyclical capital requirements are in the form of a buffer of 0-2.5 percent above the minimum regulatory capital requirements.
- Every country that is a member of the Basel committee has to designate an authority that would use its own judgment about the size of the buffer and timing of its introduction and release; the decision-making has to be done on the basis of five principles:
  - The buffer should be implemented only for the purpose of protecting the economy from potential future losses when “excess credit growth is associated with an increase in systemic risk.”
  - A credit/GDP ratio should be a main variable, signaling the timing and magnitude of the buffer, along with other variables as complementary information sources (as long as their influence on decision-making is explained).
  - The decisions should be made recognizing that the variables used may offer misleading guidance.
  - If needed, changes to countercyclical capital requirements should be released promptly.
  - The countercyclical capital requirements can be complemented by other macro-prudential tools.
- An increase in the countercyclical capital requirements buffer must be announced 12 months in advance; a reduction in the requirements would immediately follow an announcement.

**BOX 2****IS THERE A SCOPE FOR A SYSTEM OF  
“CONSTRAINED DISCRETION?”**

The recent proposal by the Basel Committee on Bank Supervision (BCBS) presented in Box 1 suggests that countercyclical capital requirements could be introduced using an approach called constrained discretion. Under such an approach, the discretionary decisions about the timing and magnitude of countercyclical capital requirements would be complemented with a communication strategy explaining the process of decision-making. Hence, while constrained discretion maintains the advantage of using a large body of information to make decisions, it aims to reduce the time-inconsistency problem and unintended consequences.

The monetary policy framework used in many countries is an example of how constrained discretion works. An institution such as a central bank can establish its credibility as a guardian of price stability by being consistent in its actions and communicating to the public the reasoning behind its decisions (Bernanke and Mishkin). Such consistency in a central bank's actions makes its decisions more predictable to market participants and shows that the central bank is committed to maintaining price stability despite its discretionary authority. Finally, a central bank's discretion allows for a thorough analysis of all available data.

Establishing a system of constrained discretion for countercyclical capital requirements, however, might be very difficult, especially because it needs to be fully effective as soon as the implementation approach is chosen. First, establishing the credibility of the authority mandated with implementing the countercyclical capital requirements would require a long period of time. Given that the events that would trigger a decision to change the countercyclical capital requirements probably would be rare, it is possible that the required credibility would not be established quickly enough before the next adverse shock hits the banking

sector (BCBS). Second, in contrast to the conduct of monetary policy, where a small number of variables such as inflation or real GDP growth are used to communicate the central bank's stance, there are no simple indicators that would effectively communicate when the regulatory authority would implement or remove countercyclical capital requirements (see Box 3 for a discussion of efforts to find good indicators). Moreover, because much of the information about the banking sector held by bank supervisors is not available to the public, it is not possible to fully communicate the policy stance and eliminate uncertainty among market participants.

### BOX 3

#### APPROACHES TO MEASURE AND LIMIT THE PRO-CYCLICALITY OF BANK CAPITAL REGULATION

Efforts are under way to find variables that would be best suited for implementing measures to reduce the procyclical effect of the Basel II capital requirements. The proposals can be grouped into the following categories: 1) changes in the methodology of measuring the risk of banks' assets, 2) using macroeconomic variables to reduce the procyclical effect of micro-prudential capital regulation, and 3) using financial variables to reduce the procyclical effect.

The first category of proposals focuses on the average risk of a bank's assets through the business cycle. In this case, the Basel II capital requirements for a given asset or a loan remain constant over the business cycle. Compared to a procyclical requirement, bank capital would be higher in booms when asset risk is relatively low and lower in recessions when asset risk is relatively high.

The second category of proposals reduces the procyclical effect of the Basel II by increasing capital requirements in booms and lowering them in recessions based on macroeconomic indicators. Drehmann and others suggest that the deviation of the credit-to-GDP ratio from its trend and a measure of aggregate losses could provide signals for the buildup and release of a countercyclical capital buffer relative to existing capital requirements. Repullo and others argue that the existing Basel II capital requirements should be augmented by a factor depending on the deviation of real GDP growth from its trend.

Finally, the third category of proposals uses capital market variables rather than macroeconomic variables as signals for correcting the Basel II capital requirements. Gordy proposes to use spreads for credit defaults swaps because they provide a timely, market-based measure of a bank's riskiness.

## ENDNOTES

<sup>1</sup>A vast literature explores why banks are able to combine these different services under one roof (see Freixas and Rochet, and Gorton and Winton for a survey).

<sup>2</sup>As the banking industry evolved, banks have engaged increasingly in loan sales and loan securitization. These activities, however, do not mean that banks become detached from their activity of creating and absorbing credit risk. Banks usually retain part of the sold or securitized loans or provide guarantees in order to ensure investors that the loans are of stated quality.

<sup>3</sup>On average, nonfinancial companies have ratios of equity to total assets of about 50 percent (Admati and others). Such ratios for large bank holding companies in the U.S. are below 10 percent. Smaller banks have slightly higher capital ratios.

<sup>4</sup>Diamond shows that credit and liquidity functions may be provided together. The reason is that depositors discipline the bank to monitor and diversify its loans in order to decrease its likelihood of default. Gorton and Pennacchi claim that credit and payment functions may be complements. Because banks hold diversified loan portfolios, they offer nearly riskless deposits used for payments. Kashyap and others offer evidence for existence of synergies in providing liquidity through deposits and loan commitments. The reason is that outflows in one of these instruments usually are matched by inflows in the other.

<sup>5</sup>The literature on banking regulation provides additional reasons for bank regulation of individual banks (Freixas and Rochet). First, regulation protects valuable lending relationships between borrowers and their banks that could be lost when banks fail. Second, regulation protects the economy from contagious failures in the banking system.

<sup>6</sup>To be precise, Basel I introduced two concepts of equity capital. One is “Tier 1” equity capital, which consists of common equity, noncumulative preferred stock, and minority interests in consolidated subsidiaries. The other is “Tier 2” capital, which includes limited amounts of loan loss allowances, other preferred stock, subordinated debt, and hybrid securities. Banks were required to hold a minimum Tier 1 capital ratio of 4 percent and a combined minimum Tier 1 and Tier 2 capital ratio of 8 percent. In addition, U.S. bank supervisors require a minimum leverage ratio of 4 percent, which is the ratio of Tier 1 capital to total unweighted assets.

<sup>7</sup>The Basel II Accord was implemented worldwide in January 2008, but its implementation in the United States was postponed. The Basel II Accord approach to credit risk follows an earlier amendment to the Basel I Accord from 1996. This amendment allowed banks to use their internal risk management models to determine their capital requirements to account for market risk.

<sup>8</sup>Repullo and Suarez simulate banks’ capital buffers under the Basel I and II Accords. They show that these buffers are not high enough to prevent a credit crunch in recessions. Acharya and others show that in the recent 2007-09 finan-

cial crisis, banks continued to pay out dividends, which depleted their common equity levels.

<sup>9</sup>Acharya and others document that the president of the Federal Reserve Bank of New York noted that the banks told regulators during the recent financial crisis that “now it is not a good time to raise capital.”

<sup>10</sup>Acharya and others suggest that the debt overhang problem is a version of risk-shifting by the banks’ shareholders at the expense of its debt holders. The reasons are explicit and implicit guarantees of banks’ survival provided by governments and reliance on short-term unsecured funding.

<sup>11</sup>Blum and Hellwig suggested that the Basel I capital requirements may have a procyclical effect. Empirical evidence shows that enforcement actions by bank supervisors aimed at making banks stick to the Basel I capital requirements might have contributed to the credit crunch at the beginning of 1990s (Peek and Rosengren). Kashyap and Stein; Repullo and Suarez; and Repullo, Saurina and Trucharte argue that the Basel II capital requirements, which tend to increase in recessions, contribute to a credit crunch even more than the Basel I capital requirements.

<sup>12</sup>Better capitalized banks usually have higher value that mitigates fears of existing and potential shareholders about the health of the issuing bank and the debt overhang problem (Mehran and Thakor).

<sup>13</sup>Brunnermeier and others and Hanson and others provide and discuss a broad set of tools that can be used in macro-prudential regulation. In addition to reducing the procyclical effect of micro-prudential bank regulation, countercyclical capital requirements could be used to reduce the likelihood of bank bailouts, the impact of asset bubbles, and the maturity transformation mismatch, all of which contribute to systemic risk in the banking sector.

<sup>14</sup>Kashyap and Stein propose a revision to the Basel II capital requirements such that the capital requirements in recessions would be lower than prudent levels as defined by the micro-prudential minimum. However, it is improbable that the bank supervisors will tolerate capital ratios below the micro-prudential minimum. Indeed, as Chairman Bernanke put it: “Counter-cyclical standards would require firms to build larger capital buffers in good times and allow them to be drawn down—but not below prudent levels—during more-stressed periods” (Bernanke). An alternative proposal is to make the micro-prudential minima vary directly with the business cycle (Repullo and others).

<sup>15</sup>The problem of time-inconsistency has been a recurrent theme in the economic literature on policymaking. Kydland and Prescott received a Nobel Prize in economics for being the first to formally address this problem and to advocate the rule-based system as a solution.

<sup>16</sup>Such a problem is most severe when the authority has to deal with individual banks.

<sup>17</sup>By the same token, an announcement reducing countercyclical capital requirement might again have negative consequences. Because such an announcement might occur in a period of heightened uncertainty, it may cause a major disruption in the capital markets.

<sup>18</sup>Drehmann and others describe an array of issues in finding variables that could be used to forecast the need for countercyclical capital requirements.

<sup>19</sup>This is not to say that the rule-based approach should ignore the potential costs of implementing countercyclical capital requirements. A well-designed rule should minimize these costs. That is, the rule should be designed in such a way that the timing and magnitude help banks arrive at the desired level of the countercyclical capital requirements at the lowest cost in terms of lost lending.

<sup>20</sup>Brunnermeier and others also suggest that the rule-based approach would be more effective than the discretionary approach because the rule-based approach is immune to outside pressures.

## REFERENCES

- Acharya, Viral, Irvind Gujral, Nirupama Kulkarni, and Hyun Shin. 2011. "Dividends and Bank Capital in the Financial Crises of 2007-2009," NBER working paper 16896, March.
- Admati, Anat, Peter deMarzo, Martin Hellwig, and Paul Pfleiderer. 2010. "Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is Not Expensive," Rock Center for Corporate Governance at Stanford University Working Paper No. 86, Stanford Graduate School of Business Research Paper No. 2065.
- Basel Committee on Banking Supervision. 2010. "Guidance for National Authorities Operating the Counter-cyclical Capital Buffer."
- Berger, Allen, Richard Herring, and Giorgio Szego. 1995. "The Role of Capital in Financial Institutions," *Journal of Banking and Finance*, vol. 19, pp. 393-430.
- Bernanke, Ben. 2009. "Financial Regulation and Supervision after the Crisis: The Role of the Federal Reserve," speech at the Federal Reserve Bank of Boston 54th Economic Conference, Chatham, Massachusetts.
- Bernanke, Ben, and Tara Lown. 1991. "The Credit Crunch," *Brookings Papers on Economic Activity*, vol. 1991, pp. 205-47.
- Bernanke, Ben, and Frederic Mishkin. 1997. "Inflation Targeting: A New Framework for Monetary Policy?" *Journal of Economic Perspectives*, vol. 11, pp. 97-116.
- Blum, Juerg, and Martin Hellwig. 1995. "The Macroeconomic Implications of Capital Adequacy Requirements for Banks," *European Economic Review*, vol. 39, pp. 739-49.
- Brunnermeier, Markus, Andrew Crockett, Charles Goodhart, Avinash Persaud, and Hyun Shin. 2009. *The Fundamental Principles of Financial Regulation*. CEPR.
- Diamond, Douglas. 1984. "Financial Intermediation and Delegated Monitoring," *Review of Economic Studies*, vol. 51, pp. 393-414.
- Drehmann, Mathias, Claudio Borio, Leonardo Gambacorta, Gabriel Jimenez, and Carlos Trucharte. 2010. "Counter-cyclical Capital Buffers: Exploring Options," BIS Working Papers No 317.
- Freixas, Xavier, and J-C. Rochet. 2008. *Microeconomics of Banking*. MIT Press.
- Gorton, Gary, and George Pennacchi. 1990. "Financial Intermediaries and Liquidity Creation," *Journal of Finance*, vol. 45, pp. 49-71.
- Gorton, Gary, and Andrew Winton. 2003. "Financial Intermediation," George Constantinides, Milton Harris, and Rene Stulz, eds., *The Handbook of the Economics of Finance: Corporate Finance*. Elsevier Science.
- Hanson, Samuel, Anil Kashyap, and Jeremy Stein. 2010. "A Macroprudential Approach to Financial Regulation," *Journal of Economic Perspectives*, vol. 25, pp. 3-28.
- Hellwig, Martin. 2010. "Capital Regulation after the Crisis: Business as Usual?" MPI preprint 2010/31.
- Hoenig, Thomas. 2009. "Crisis: Reaction and Resolution," speech at the Financial Stability Institute, Bank for International Settlements.
- Hoenig, Thomas. 2010. Oral Statement before the House Financial Services Oversight and Investigations Subcommittee.
- Kashyap, Anil, Raghuram Rajan, and Jeremy Stein. 2002. "Banks As Liquidity Providers: An Explanation for the Co-Existence of Lending and Deposit-Taking," *Journal of Finance*, vol. 57, pp. 33-73.

- Kashyap, Anil, and Jeremy Stein. 2003. "Cyclical Implications of the Basel II Capital Standards," working paper.
- Kydland, Finn, and Edward Prescott. 1977. "Rules Rather than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy*, vol. 85, pp. 473-92.
- Mehran, Hamid, and Anjan Thakor. 2010. "Bank Capital and Value in the Cross-Section," *Review of Economic Studies*, forthcoming.
- Morgan, Donald. 2002. "Rating Banks: Risk and Uncertainty in an Opaque Industry," *American Economic Review*, vol. 92, pp. 874-88.
- Myers, Stewart. 1977. "Determinants of Corporate Borrowing," *Journal of Financial Economics*, vol. 5, pp. 147-75.
- Myers, Stewart, and Nicholas Majluf. 1984. "Corporate Financing and Investment Decisions when Firms Have Information Investors Do Not Have," *Journal of Financial Economics*, vol. 13, pp. 187-221.
- Peek, Joe, and Eric Rosengren. 1995. "Bank Regulation and the Credit Crunch," *Journal of Banking and Finance*, vol. 19, pp. 679-92.
- Repullo, Rafael, and Javier Suarez. 2010. "The Procyclical Effects of Bank Capital Regulation," CEMFI working paper.
- Repullo, Rafael, Jesus Saurina, and Carlos Trucharte. 2010. "Mitigating the Pro-Cyclicality of Basel II," Bank of Spain Working Paper 1028.
- Spong, Ken. 2000. *Banking Regulation*, Federal Reserve Bank of Kansas City.