

CHAPTER 1

Risk-Based Capital Rules

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The reality of financial regulation is that new rules open new avenues for regulatory arbitrage, as institutions find loopholes in regulations. That in turn forces authorities to institute new regulations in an ongoing cat-and-mouse game (between a very adroit mouse and a less nimble cat). Staying away from dark corners will require continuous effort, not one-shot regulation.

—*Olivier Blanchard*¹

If federal regulators are thought to have better judgment about risk than the bankers themselves (due to the bankers' presumed moral-hazard problems), then there really is no reason to allow private banking to continue.

—*Jeffrey Friedman and Wladimir Kraus*²

Financial instability has vexed policymakers for generations. Many well-intentioned efforts have so far not been able to insulate modern economies from banking crises. One of those efforts, undertaken in the 1980s and still included in the structure of bank regulation, is to impose minimum capital requirements on banks that vary according to regulatory measures of risk. These risk-based capital rules are the subject of this chapter.

Risk-based capital rules were first issued in the United States as part of the international bank regulation agreement known as the Basel Accords, which were adopted in the 1980s in the aftermath of the US Savings and Loan Crisis. Subsequently, they have been modified several times. “The History of Risk-Based Capital Regulations” section of this chapter reviews the history of these rules.

The original rules, known as Basel I, and one of the modifications, known as the Recourse Rule, played a role in steering mortgage lending in the United States away from the “originate to hold” model for acquiring mortgage assets. These rules instead encouraged banks to obtain highly rated tranches of securities backed by mortgages. As a result, risk-based capital rules contributed to financial instability, quite the opposite of their intended objective. This is explained in “Risk Buckets, Securitization, and the Financial Crisis.”

During the crisis itself, banks came under pressure to sell mortgage securities in order to comply with capital rules. That in turn drove prices for securities lower, which worsened the balance-sheet conditions of other financial institutions. Thus, in the context of a crisis, risk-based capital rules were revealed to be procyclical, which is undesirable from the perspective of financial stability. “Procyclical in a Crisis” looks at this issue.

Risk-based capital rules dramatically affect the rate of return banks earn from holding different types of assets. Regardless of the intent of these rules, they strongly influence capital allocation in the economy. They substitute even crude regulatory judgment for individual bank discretion and market mechanisms. As Friedman and Kraus point out, these rules impose on bank managers the regulators’ judgment about the riskiness of different asset classes. These judgments override both the local knowledge of the individual bank manager and the evolutionary learning that comes from success and failure in the market. This aspect of the risk-based capital approach is discussed in “The Regulators’ Calculation Problem.”

What is the public policy rationale for risk-based capital rules? In “Managers, Risks, and Incentives,” I argue that the motivation for risk-based capital rules is to try to increase the incentives for bank managers to make prudent decisions with respect to portfolio selection (operating leverage) and capital structure (financial leverage). In part, the government is trying to offset

adverse incentives created elsewhere by government policy. The three government policies that encourage risk taking are the tax advantage of debt finance, the explicit guarantee of deposits through deposit insurance, and the implicit guarantee of bank debt that derives from policymakers' reluctance to permit bankruptcy of large financial firms ("too big to fail").

In "Alternatives to Capital Rules," I argue that risk-based capital rules are a misguided attempt to enhance bank soundness. The regulators' risk buckets effectively determine the prices of different types of assets. Because the regulators are far from omniscient as price-setters, the regulations are more likely to exacerbate than to reduce financial instability.

Instead, banking policy should focus more on the overall incentives for bank managers to act prudently. One option is to reduce the tax advantage associated with debt finance. Another option is to limit the total dollar amount of government-guaranteed deposits that a single institution can have in its liabilities. A third option is to use holistic audits of banks to evaluate their risk management, rather than relying on a simple formula. A final option is to enact legislation that puts some of the compensation of bank management at risk should the bank fail.

THE HISTORY OF RISK-BASED CAPITAL REGULATIONS³

In 1974, the central bankers of the Group of Ten (G10) countries established what became the Basel Committee on Banking Supervision to enable bank regulators in these countries to communicate and coordinate with one another.⁴

As recently as 1980, the Federal Deposit Insurance Corporation (FDIC) and the Federal Savings and Loan Insurance Corporation (FSLIC) had no formal numerical rules or guidelines concerning bank capital. Instead, capital was one of the factors included in a judgmental approach to evaluating bank risk. Altogether, the factors were capital adequacy, asset quality, management, earnings, and liquidity, producing the acronym CAMEL. In 1995, another factor was added, representing sensitivity to market risk, leading to the acronym CAMELS.

The year 1981 saw the FDIC introduce the first numerical capital standards applicable to all banks. However, the standards differed slightly by type of institution. Community banks were given a standard ratio of capital to assets

of 6 percent, while large regional institutions were assigned a standard of 5 percent.

In 1985, US regulators abolished the differences by type of bank in favor of a uniform standard of 5.5 percent. Regulators also made it clear that banks whose ratio of capital to assets fell below 3 percent would face enforcement actions.

Meanwhile, regulatory agencies in the United States and the Basel Committee were considering two important issues with regard to capital regulation. One issue was how to include off-balance-sheet items, such as loan guarantees. Another issue was how to adjust capital standards for the risk of the bank's asset portfolio.

In July 1988, the Basel Committee issued its first important recommendations (Basel I), which bank regulators agreed to implement by 1992. Basel I included two definitions of capital. Tier 1 capital, or core capital, consisted only of common stockholders' equity, noncumulative perpetual preferred stock, and minority interests in equity accounts of consolidated subsidiaries (minus goodwill), plus disclosed reserves. Tier 2 capital, or supplementary capital, consisted of allowance for loan and lease losses (up to 1.25 percent of risk-weighted assets), perpetual preferred stock, hybrid capital instruments and mandatory convertible debt securities, term subordinated debt, and intermediate-term preferred stock. The amount of term subordinated debt plus intermediate-term preferred stock that could count as supplementary capital could not exceed 50 percent of core capital.

Total capital consisted of Tier 1 capital plus Tier 2 capital. Basel I called for a minimum ratio of total capital to risk-weighted assets of 8 percent. Also, at least half of this total capital had to be Tier 1 capital, which meant that the minimum ratio of core capital to total assets was 4 percent.

Basel I called for risk-weighted assets to be computed using four risk buckets, with national banking regulators having some discretion to assign asset classes to each bucket. The risk buckets were defined as 100 percent, 50 percent, 20 percent, and 0 percent, with each number representing a percentage of the highest risk class. Thus, if all of a bank's assets were in the 100 percent risk bucket, the bank would be required to have a minimum ratio of total capital to assets of 8 percent (including at least 4 percent Tier 1 capital). If all the bank's assets were in the 20 percent risk bucket, then the minimum capital ratio would be just 1.6 percent (including at least 0.8 percent Tier 1 capital).

If a bank's assets consisted of \$50 in the 100 percent bucket and \$50 in the 20 percent bucket, then its risk-weighted assets would be $\$50 + \$10 = \$60$, and its total capital requirement would be 8 percent of that, or \$4.80, with at least half of that consisting of Tier 1 capital.

In the United States, the risk buckets were specified as follows:

0 percent (not requiring any capital): Cash, balances due from Federal Reserve banks and Organisation for Economic Co-operation and Development (OECD) central banks, US Treasuries, gold.

20 percent: Cash items in the process of collection; all claims on, and the portions of claims guaranteed by, US depository institutions and OECD banks; all short-term claims on, and the portions of short-term claims guaranteed by, non-OECD banks; the portions of claims that are conditionally guaranteed by the central governments of OECD countries and US government agencies; claims on, and the portions of claims guaranteed by, US government-sponsored agencies; general obligation claims on, and the portions of claims that are guaranteed by the full faith and credit of, local governments and political subdivisions of the United States and other OECD local governments; claims on, and the portions of claims that are guaranteed by, official multilateral lending institutions or regional development banks; the portions of claims that are collateralized by securities issued or guaranteed by the US Treasury, the central governments of other OECD countries, US government agencies, US government-sponsored agencies, or by cash on deposit in the bank; the portions of claims that are collateralized by securities issued by official multilateral lending institutions or regional development banks; certain privately issued securities representing indirect ownership of mortgage-backed US government agency or US government-sponsored agency securities; investment in shares of a fund whose portfolio is permitted to hold only securities that would qualify for the 0 or 20 percent risk categories.

Note that government-sponsored agency securities includes securities issued by Freddie Mac and Fannie Mae.

50 percent: Loans secured by first liens on one to four family residential properties; revenue bonds or similar claims that are obligations of US state or local governments, or other OECD local governments, but for which

the government entity is committed to repay the debt only out of revenues from the facilities financed; credit equivalent amounts of interest rate and foreign exchange rate related contracts, except for those assigned to a lower risk category.

100 percent: All other claims on private obligors.

US regulators finalized their Basel I rules in 1989, with requirements phased in through the end of 1992.

The regulators also arrived at a classification scheme (table 1) for bank capital adequacy.

Regulatory policies for addressing a bank that failed to maintain at least adequate capital were known as prompt corrective action. These included:

- An institution deemed below adequately capitalized must file a written restoration plan within forty-five days of notification. The regulatory agency must decide on approval within sixty days. If a plan is not approved, not submitted, or not implemented, the institution is immediately subject to “significantly undercapitalized” conditions.
- Immediately upon being deemed undercapitalized, significantly undercapitalized, or critically undercapitalized, the institution is subject to:
 - (i) Restricting payment of distributions and management fees;
 - (ii) Requiring that the agency monitor the condition of the institution;
 - (iii) Requiring submission of a capital restoration plan;
 - (iv) Restricting the growth of the bank’s assets; and
 - (v) Requiring prior approval of certain expansion proposals.
- Significantly and critically undercapitalized institutions are immediately subject to an additional provision that restricts compensation paid to senior executive officers of the institution.

Critically undercapitalized institutions were immediately subject to additional provisions that varied by regulator. In fact, the expectation was that the agency insuring the depositors of the institution would either take over or arrange a merger of that institution within ninety days of it being deemed critically undercapitalized.

In the mid-1990s, the Basel Committee began wrestling with the concept of market risk. Prior to this, the risk buckets were based solely on credit

Table 1. Basel I Bank Capital Adequacy Classification Scheme

Category	Ratio of Total Capital to Risk-Weighted Assets	Ratio of Tier 1 Capital to Risk-Weighted Assets
Well capitalized	10 percent or greater	6 percent or greater
Adequately capitalized	8 percent or greater	4 percent or greater
Undercapitalized*	Less than 8 percent	Less than 4 percent
Significantly undercapitalized*	Less than 6 percent	Less than 3 percent
Critically undercapitalized		Less than 2 percent

*Falls into this category if either ratio falls below the threshold.

risk. However, banks also risked taking losses from changes in interest rates, exchange rates, or other factors. In 1996, the Committee formally recommended addressing market risk using an approach known as a value at risk (VaR). These topics are outside of the scope of this chapter.

Starting in 1995, US bank regulators tried to address transactions in which the risk of an asset and the ownership of the asset were separated. The issue first arose in the form of a bank selling a loan but giving the buyer “recourse” to put the loan back to the bank in the case of default. Hence, this regulatory issue became known as the Recourse Rule.

By the time that the Recourse Rule was finalized by the Federal Reserve Board, the Office of the Comptroller of the Currency, and the FDIC in 2001, the main issue to address was asset-backed securities, which were being sliced into tranches with different levels of risk. The regulators had to develop a policy for assigning risk weights to the different tranches. They settled on using ratings by Nationally Recognized Statistical Rating Organizations (NRSROs). Securities rated AAA or AA were given a risk weight of 20 percent. A security rated A would be assigned a risk weight of 50 percent. A security rated BBB (the lowest investment grade) was assigned a weight of 100 percent, and securities rated BB (below investment grade) were assigned a risk weight of 200 percent.

In 2004, the Basel Committee put out a new paper of recommendations that became known as Basel II. Basel II included using NRSRO ratings for corporate bonds. It also allowed for models-based risk calculations, similar to VaR, for credit risk. In the United States, rules for implementation of Basel II were published at the end of 2007, but implementation was superseded by

the financial crisis and subsequent Dodd-Frank legislation. The approach to be implemented in the near future precludes regulators from using NRSRO ratings for security tranches. Among other changes, it raises the minimum Tier 1 capital requirement to 6 percent and also allows for an additional countercyclical capital buffer of up to 2.5 percent to be applied to large banks at regulators' discretion during a period of high credit growth.

RISK BUCKETS, SECURITIZATION, AND THE FINANCIAL CRISIS

By the mid-1980s, policymakers had experienced the Savings and Loan Crisis, which affected the thrift industry in the United States, and the Latin American debt crisis, which affected large commercial banks in many countries. They decided that one of the issues that needed to be addressed was the need to adjust minimum capital requirements for the risk of a bank's asset portfolio. In the absence of any adjustment, a bank could meet the minimum capital requirement while acquiring a portfolio of risky assets for which the required regulatory capital provided insufficient protection.

Regulators were particularly concerned about the potential impact of cross-country differences in the regulatory treatment of assets. Suppose that there is a low-yielding, low-risk asset, Z, and there are two risky assets, X and Y. If one country discouraged banks from holding risky asset X but not risky asset Y, while another country discouraged banks from holding Y but not X, then each country's banks could end up holding nothing but risky assets, with all banks spurning the low-risk asset, Z.

The approach adopted in 1988, known as Basel I, classified different types of assets into "risk buckets." The riskiest assets, commercial loans, had a weight of 1.0. If the capital requirement was 8 percent, then each additional \$100 in commercial loans required the bank to raise an additional \$8 in capital. On the other hand, government debt had a weight of zero, so that a bank could increase its holdings of government debt without raising any additional capital. (Note that even default-free government debt carries risk, in that long-term bonds can change in value as interest rates change.) The securities of government-sponsored enterprises, including Fannie Mae and Freddie Mac, were given a weight of 0.2, meaning that if the capital requirement was 8 percent, each additional \$100 in Freddie or Fannie securities required only \$1.60 in additional capital.

In 2001, an important modification to the risk buckets was incorporated in what was called the Recourse Rule.⁵ The original purpose of the rule was to deal with assets that were off of a bank's books but for which the bank remains exposed from a risk perspective. For example, if a bank has sold a loan to another institution with recourse, that means that in the event the loan defaults, the other institution can force the bank to repurchase the loan at par. Thus, although the loan is off the books, the bank is still liable for the risk. The Recourse Rule required the bank to hold capital against such a loan, just as if it held that loan in portfolio.

Along with the Recourse Rule, the regulators changed their approach to assigning risk weights to tranches of asset-backed securities. The new approach was based on risk ratings by NRSROs. This reduced the risk-weight for AAA-rated and AA-rated securities backed by mortgages to just 20 percent. As Friedman and Kraus pointed out, this provision stimulated very rapid growth in the issuance of private mortgage-backed securities, meaning securities that were not issued by Freddie Mac or Fannie Mae. Because Wall Street underwriters could fashion large tranches of AAA-rated and AA-rated securities (these were known as "senior" tranches) even when the underlying mortgages were subprime loans, this in turn created the financial fuel for the boom in subprime lending and the housing bubble.

To understand the power of the risk buckets to influence bank behavior, consider a hypothetical example. Suppose that a bank faces a capital requirement of 8 percent of risk-weighted assets, and it is trying to choose from among deploying its capital to make commercial loans, mortgage loans that it originates and holds, or highly rated mortgage securities backed by loans originated by other lenders. Each \$8 in capital can support either \$100 in commercial loans, \$200 in mortgage loans originated to hold or AA-rated mortgage-backed securities, or \$500 in AAA-rated mortgage-backed securities.

Bank regulators, by establishing low-risk weights on mortgages and especially on mortgage-backed securities, exerted a powerful influence on the allocation of capital not only in the United States but throughout the world. Trillions of dollars of the world's savings were directed toward an expansion of mortgage credit to American households.

If the intent of the regulators was to reduce systemic financial risk, they did not succeed. It turned out that there were several flaws in the risk buckets:

1. The task of assigning ratings to mortgage securities was given to credit rating agencies, primarily Moody's, Standard and Poor's, and Fitch. To maintain its market share, each rating agency had the incentive to find ways to generously rate the security structures produced by Wall Street firms. Because the ratings were used primarily for regulatory purposes, the rating agencies had relatively little incentive to please investors by producing ratings on securities that were as conservative as those on corporate bonds.
2. Among regulators, investors, and rating agency analysts, the assumption was widespread that any decline in house prices would be concentrated in local markets. Under this assumption, geographic diversification could serve to ensure the safety of senior tranches of mortgage-backed securities. In fact, the house price declines that took place were more widespread than had been allowed for in the statistical models used to rate the securities.
3. Regulators, investors, and rating agency analysts paid insufficient attention to the deterioration in the quality of the underlying mortgage loans. Increasingly, borrowers lacked the means to meet the payments on loans. The only way that they could avoid default was to take out a new loan to pay off their mortgages. This refinancing process in turn required continual appreciation of home values in order to support rolling over mortgage loans in this way. Because of the fragile financial situations of so many borrowers, when house prices stopped rising the default rates were higher than would have been the case with loans that met more traditional, conservative underwriting standards.

PROCYCLICAL IN A CRISIS

The intent of capital requirements is to prevent financial crises by ensuring that banks hold sufficient capital to cover their risks. However, an unintended side effect of capital requirements is that they are procyclical. That is, they encourage banks to expand when times are good, and they amplify bank contraction when times are bad. During a crisis, this can create a particularly rapid vicious cycle.

During good times, the market value of bank assets may increase. That is, a loan that was made last year and appeared to be risky now seems safe because of good economic conditions (perhaps an increase in home prices has reduced the risk of a mortgage loan). This increase in value adds to the equity of the bank, providing it with more capital. The bank may choose to expand lending, and as banks do so, this may feed the process of economic expansion, raising the value of bank assets even further.

During bad times, the process reverses. The value of bank assets falls, and capital ratios start to fall. To restore capital ratios, banks will contract lending or sell assets. This in turn will reduce the market value of other bank loans, causing capital ratios to fall further.

The typical bank asset is a loan, the value of which can fall farther and faster than it can rise. That is because the value of a loan depends on the probability that it will be repaid, which tends to be high to begin with. If the probability of repayment is 95 percent, then the most that the probability can increase is 5 percent, which will only increase the value of the loan by a small amount. However, the probability of repayment can decrease by 95 percent, which would lower the value of the loan considerably.

During a crisis, the procyclical characteristic of capital requirements becomes quite pronounced. The value of bank assets declines sharply, forcing banks to rapidly sell off assets, reducing their market values even further.

Risk-based capital regulations proved to be particularly procyclical during the financial crisis of 2008. During the crisis, the rating agencies downgraded the ratings of mortgage-backed securities. Not only did the market value of these assets fall, but the downgrades moved these securities into higher risk buckets, requiring banks to hold more capital against these assets.

Market-value accounting, which requires banks to value their assets at market prices, plays a role in this procyclical behavior. Prior to the 1980s, regulators allowed banks to carry assets at book value, which means that changes in market conditions do not require banks to revalue their assets. During a downturn, therefore, the decline in the market value of assets does not affect capital requirements.

During the Savings and Loan Crisis, book-value accounting made it very difficult for regulators to identify and resolve troubled institutions in a timely manner. Thrifts held mortgages that had been originated at low interest rates,

and the market value of these assets had fallen considerably as rates rose. However, the loans were still carried at book value, so the firms could insist that they were sound when in fact they were insolvent. This historical cost accounting was widely criticized. For example, in 1991, Richard Breeden, then chairman of the US Securities and Exchange Commission, wrote,

The nation's experience with the savings and loan industry demonstrates the substantial danger of a reporting system for financial institutions that is premised on historical cost accounting principles. Because [generally accepted accounting principles (GAAP)] failed to reflect massive unrealized losses in savings and loan portfolios, institutions that were deeply insolvent on an economic basis continued to operate and to report a positive net worth. Besides tending to legitimize a policy of regulatory forbearance, the absence of adequate market-based information made it difficult for investors to make a meaningful assessment of the real economic value and risk exposure of a depository institution. We should therefore explore the extent to which the relevance and credibility of bank and thrift financial statements can be enhanced by a broader application of market value accounting.⁶

Market-value accounting gives regulators a more accurate assessment of the financial condition of a bank. Returning to book-value accounting would reduce the procyclical responses of banks, but at the cost of making it much more difficult for regulators to distinguish troubled banks from sound ones.

Rather than abandon market-value accounting in the hope of mitigating procyclical bank behavior during a crisis, regulators would do better to focus on making capital requirements less procyclical. For example, as an economic expansion matures, the basic capital requirement might be raised, say, from 8 percent to 10 percent. In a crisis situation, regulators might temporarily lower the capital requirement, thereby reducing banks' need to rapidly sell assets in order to remain in compliance.⁷

THE REGULATORS' CALCULATION PROBLEM

Many decades ago, Ludwig von Mises and F. A. Hayek pointed out that socialist central planners would face a computational challenge in deciding how to allocate resources. In a market system, prices work as signals to indicate scarcity or surplus. In the absence of such signals, a central planning body would have to substitute its own judgment in deciding where production should be increased or decreased. This is known as the socialist calculation problem.⁸

Regulators face a similar calculation problem. For example, in deciding whether to require that a safety device, such as an air bag, be installed in cars, the regulator must make a benefit-cost calculation. However, in such relatively narrow regulatory decisions, the regulator can rely on a relatively clear set of facts and assumptions.

In the case of risk-based capital requirements, the regulator is affecting the relative returns of an enormous range of investments. Instead of leaving it up to the bank to determine the relative risk of mortgage loans, asset-backed securities, or commercial loans, the regulatory body is taking upon itself the task of setting relative prices for these asset classes.

One disadvantage that regulators have in setting relative prices among asset classes is a lack of specific information. When a bank chooses to make a loan, it can examine the specific characteristics of the borrower, the purpose of the loan, and any collateral against which the loan will be made. The regulatory body ignores all of this specific information in setting up its arbitrary risk buckets.

As noted earlier, the consequences of ignoring specific information can be considerable. On its own, a bank likely would have paid close attention to the fragile financial condition of borrowers who were applying for mortgage loans in the latter years of the housing boom. The regulators gave this issue no consideration in putting highly rated mortgage-backed securities into a low-risk bucket. Moreover, the rating agencies to which regulators delegated the authority to assign AA and AAA ratings also paid little or no attention to the specific characteristics of the mortgages or borrowers involved.

Risk-based capital requirements serve to centralize the process of assessing the relative risk of different investments. This necessarily reduces the amount of local, specific information that is incorporated in decision-making. Because such information can be very important in the context of lending, the adverse

consequences can be quite severe. As Andrew Haldane, executive director of the Bank of England, put it,

Hayek titled his 1974 Nobel address “The Pretence of Knowledge.” In it, he highlighted the pitfalls of seeking precisely measurable answers to questions about the dynamics of complex systems. Subsequent research on complex systems has confirmed Hayek’s hunch. Policy predicated on over-precision risks catastrophic error. Complexity in risk models may have perpetuated Hayek’s pretence in the minds of risk managers and regulators.⁹

Another, more subtle effect of centralized risk assessment is that it chokes off the market’s evolutionary learning process. With decentralized risk assessment, each bank’s underwriting policies and procedures represent an experiment. Those policies and procedures that work well will be maintained and emulated. Those that work poorly will be modified or driven from the market altogether.

In contrast, with risk assessment concentrated in the hands of a single regulatory body, there is no such process of experimentation, evaluation, and evolution. The regulator’s learning process is likely to be much slower and the regulator’s mistakes, rather than being limited in scope to a few institutions, will be systemic.

MANAGERS, RISKS, AND INCENTIVES

Banks, like all firms, face two broad decisions with respect to risk. One decision concerns *financial leverage*, which is the ratio of debt to equity. The other decision concerns *operating leverage*, which is the choice between high-risk investments and low-risk investments.

An individual firm’s managers make these decisions in the context of a capital market in which investors have the opportunity to alter their own risk profiles. This ability of individual investors to make their own portfolio choices plays an important role in modern corporate finance.

For example, there is the Modigliani-Miller theorem,¹⁰ which in its most basic form says that in the absence of tax distortions and bankruptcy costs, investors are indifferent with respect to financial leverage. If, as an investor,

I am uncomfortable with the ratio of debt to equity at a given firm, I can dial up the leverage by buying shares on margin or dial down the leverage by holding shares in combination with risk-free short-term bonds.

Next, there is modern portfolio theory as first articulated by Sharpe,¹¹ which says that as an investor, I can use diversification across firms to mitigate the operating leverage of the individual firms. Only to the extent that returns on investment projects are correlated across firms am I unable to diversify away risk. From the point of view of an investor in a broad market portfolio, the risk of an individual investment project is not its overall variability but only that portion of variability that is not diversifiable.

The Modigliani-Miller theorem would suggest that investors might not care about capital ratios at banks. If a bank has “excess” capital, an investor can take a levered position in that bank. If a bank has a thin capital margin, an investor can compensate for this by purchasing risk-free securities.

Portfolio theory would suggest that investors would not care about whether banks choose high-risk or low-risk assets. Instead, an investor would evaluate one bank's assets in terms of how much risk they add in the context of the investor's entire portfolio, taking into account diversification.

In fact, as Modigliani, Miller, and others recognized, tax distortions and bankruptcy costs are important. Because interest expenses are deductible from corporate income taxes, while dividend payments are not, the most tax-efficient capital structure is one with the highest ratio of debt to equity. Working against this is the fact that there are costs of going through bankruptcy. Legal expenses are incurred in undertaking reorganization under bankruptcy. Even more important are the costs associated with damage to the firm's reputation with counterparties and creditors. Becoming insolvent costs a firm in terms of lost “franchise value.”

A firm's managers may attach more significance than its shareholders to franchise value. While shareholders may be diversified, managers are likely to have a large share of their financial wealth and human capital tied to the specific firm. Relative to shareholders, managers may prefer to run the firm with less operating leverage and also less financial leverage.

Under a partnership structure, as opposed to a public corporation, managers have an especially large share of their financial wealth tied up with the firm. This tends to make managers more attuned to franchise value and more risk-averse in a partnership structure.

For a bank, franchise value is particularly important. Bank customers place a high value on the liquidity and safety of their funds on deposit. A bank with a strong reputation will be able to attract deposits at a much lower interest rate than a bank that is considered weak.

One component of franchise value that has been important in banking is charter value, which is the value of the legal right to engage in banking. Historically, governments have made bank charters difficult to obtain. When a charter is difficult to obtain, competition is restricted and profits are high. Shareholders and managers have an incentive not to take risks that could lead to bankruptcy and loss of the charter.

As of 1970, competition in banking in the United States was limited by restrictions on branch banking, ceilings on deposit interest rates, and the legal separation of investment banking from commercial banking. These restrictions on competition made charters for banks and savings and loans relatively valuable, and this may have contributed to conservative management.¹²

Over the next two decades, these regulations were gradually eliminated. In addition to these policy changes, high inflation in the 1970s interacted with Regulation Q ceilings on interest rates on deposits to cause consumers to seek higher yields outside of banks and thrifts. Higher interest rates also undermined the value of savings and loan charters by increasing the risk associated with using deposits to fund mortgage loans. Innovations such as the money market fund reduced the value of bank charters by giving investment banks a tool to compete against bank deposits for short-term liquid funds.

All of these developments in the 1970s and 1980s reduced charter value for banks and savings and loans, which may have made management less conservative and may account for the crises of those decades that in turn led policymakers to develop the Basel Accords.

Government guarantees tend to increase the incentive for bank managers to take risks. Deposit insurance and the implicit guarantee of too big to fail (TBTF) reduce the cost of debt finance. This encourages more financial leverage by lowering the cost of debt relative to equity. It also encourages operating leverage, because shareholders retain the upside while the cost of adverse results is shifted in part to taxpayers.

Economists see government guarantees as creating moral hazard at banks. That is, managers have an incentive to take more risk than otherwise would be prudent. This in turn implies a need for regulators to try to limit risk taking.

Note, however, that as Friedman and Kraus point out, before the financial crisis, most banks were *not* taking the maximum amount of operating risk or regulatory risk allowed under the Basel Accords. This suggests that the capital requirements may not have been the binding constraint on bank risk taking. Instead, banks used less financial leverage and invested more safely than was required by regulation. Perhaps franchise value dictated even less risk-taking than was tolerated by regulatory capital requirements.

ALTERNATIVES TO CAPITAL RULES

In postmortems written in the wake of the 2008 financial crisis, risk-based capital rules have come in for considerable criticism. For example, the Bank of England's Andrew Haldane wrote,

[C]onsider the experience of a panel of 33 large international banks during the crisis. This panel conveniently partitions itself into banks subject to government intervention in the form of capital or guarantees (“crisis banks”) and those free from such intervention (“no crisis banks”). . . .

[T]he reported capital ratios [just prior to the crisis] of the two sets of banks are largely indistinguishable. If anything, the crisis banks looked slightly stronger pre-crisis on regulatory solvency measures. Second, regulatory capital ratios offer, on average, little if any advance warning of impending problems.¹³

Acharya, Schnabl, and Suarez wrote,

Securitization was traditionally meant to transfer risks from the banking sector to outside investors and thereby disperse financial risks across the economy. Since the risks were meant to be transferred, securitization allowed banks to reduce regulatory capital. However, in the period leading up to the financial crisis of 2007–09, banks increasingly devised securitization methods that allowed them to retain risks on their balance sheets and yet receive a reduction in

regulatory capital, a practice that eventually led to the largest banking crisis since the Great Depression.¹⁴

Capital rules have not worked well as a tool for promoting prudence and financial stability in the banking system. In hindsight, it is easy to see why.

A simple capital rule, which sets a minimum ratio of capital to total assets, only affects financial leverage. It does not affect operating leverage. A bank could meet the requirement of a simple capital rule while taking inordinate risks simply by investing in risky assets.

The fact that a simple capital rule can be undermined using operating leverage is what gives rise to the alternative of risk-based capital rules. However, risk-based capital rules are problematic in that they substitute the crude, distant judgment of regulators for the refined, local knowledge of bank management in determining the relative risk of different types of assets.

Policy makers should consider alternative ways to influence bank managers to take less risk. Financial leverage could be reduced by increasing the cost of debt relative to equity. Financial leverage and operating leverage could be reduced by making franchise value more salient to managers.

Steps that would bring the cost of debt more in line with equity could include:

- Lowering the corporate income tax rate, which in turn would reduce the tax advantage of debt.
- Limiting the deductibility of interest on debt, particularly for financial firms. For example, the tax laws could be changed so that beyond the first \$100 million in interest expense, only 80 percent of interest expense is deductible from corporate income tax.
- Limiting the amount of government-insured deposits available to any one financial institution. If this limit were below the level of deposits currently held at the nation's largest banks, the result would be to shrink the largest banks and reduce concentration in banking. That in turn could reduce the "too big to fail" subsidy for risk taking at the largest banks.
- Limiting the aggregate amount of insured deposits. This could be done through a voucher system. If the FDIC were to insure \$1 trillion in the aggregate, then it would auction vouchers for \$1 trillion in deposit insurance.¹⁵ These vouchers would then trade in a secondary market.

The cost of the vouchers would add to the interest expense that banks pay on deposits. That in turn would reduce the incentive of bank managers to add deposits and thereby increase financial leverage.

Steps that would make franchise value more salient would include:

- Holistic audits of bank management practices. Audits could cover a range of issues, including the way that compensation incentives align with risk management, the way that training programs align with risk management, the responsibilities assigned to key executives for risk management, the formal risk management policies of the organization and the methods used to ensure internal compliance, and so on. Adverse audit findings can be used to compel banks to make changes to management practices or face penalties, such as suspension of dividend payments and executive bonuses.
- Having bank managers paid in part in deferred compensation, with the deferred compensation a junior liability of the bank. In the event that the bank has to be rescued or put through bankruptcy, the deferred compensation is forfeited. This would increase the managers' incentive to treat franchise value as important.
- Deliberately increasing the barriers to competition in banking. In theory, this would make banking more profitable and thereby increase charter value. This may have been the effect of banking laws that existed from the mid-1930s through the mid-1970s. However, these regulations kept small depositors from earning fair market returns on their funds. Also, financial institutions were driven to innovate in ways to evade such regulations, and these regulations did not succeed in preventing the Savings and Loan Crisis. Indeed, they likely contributed to it. Thus, as a policy option, raising barriers to entry may have too many drawbacks to be a viable option.

CONCLUSION

Risk-based capital rules put the wrong agents in charge of assessing the relative risk of different assets. Bank regulators do not possess the information,

particularly at a detailed level, that is needed for this task. However, for many reasons, particularly the existence of explicit and implicit government guarantees of bank creditors, the public has an interest in seeing that bank managers have an incentive to behave prudently. One approach for doing this is to decrease the incentive for high financial leverage by raising the relative cost of debt finance. Another option is to limit the total dollar amount of government-guaranteed deposits that a single institution can have in its liabilities. A final option might be to increase the personal liability of bank management in the event of failure.

NOTES

1. Blanchard, "Where Danger Lurks."
2. Friedman and Kraus, *Engineering the Financial Crisis*, 61.
3. The information in this section was collated from a variety of sources, including the FDIC, "First Fifty Years." I would like to thank Kristine Johnson for research assistance.
4. Bank for International Settlements, "History of the Basel Committee."
5. Board of Governors of the Federal Reserve System et al., "Agencies Adopt Recourse."
6. Breeden, "Thumbs on the Scale."
7. A somewhat more complex and flexible scheme was proposed under Basel III. See Bank for International Settlements, "Guidance for National Authorities."
8. Key articles on this topic include Mises, "Economic Calculation"; and Hayek, "Use of Knowledge in Society."
9. Haldane, "Capital Discipline," 6.
10. Modigliani and Miller, "Cost of Capital."
11. Sharpe, "Capital Asset Prices."
12. See Salter, "Robust Political Economy"; Gorton, *Slapped by the Invisible Hand*, 54–58.
13. Haldane, "Capital Discipline."
14. Acharya, Schnabl, and Suarez, "Securitization without Risk Transfer."
15. Along these lines, Tuckman ("Federal Liquidity Options," 25), suggested that one "approach could be to determine an appropriate total quantity of deposit insurance to be outstanding at any time and to auction that quantity to eligible banks."

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