Corporate Governance and Prudential Regulation of Banks: Is There Any Connection?

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Abstract

One "narrative" of the financial crisis of 2007-2009 is that poor corporate governance at financial institutions was a major cause of the crisis. An immediate implication of this narrative is that better corporate governance – a better alignment of the interests of senior management with the interests of their shareholders – would have prevented (or at least ameliorated) the crisis. This chapter argues that this corporate governance narrative is largely misguided and reflects an inadequate understanding of modern finance and financial theory. Because of the protections of limited liability, it is in the interests of diversified shareholders of a corporation (including financial institutions) to encourage senior managers to undertake greater risks than is in the interests of the corporation's creditors (or of regulators who may represent depositor-creditors or the interests of society more generally). Consequently, public policy should look to improved prudential regulation, rather than improved corporate governance, for restraining the excessively risky activities of systemically important financial institutions.

Key words: Corporate governance; limited liability; prudential regulation; capital; leverage

JEL codes: G21; G28; G34

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I. Introduction

In the aftermath of the financial crisis of 2007-2009, a number of "narratives" about the causes of the crisis have developed. One specific narrative will be the topic of this chapter: That a major (if not the major) cause of the crisis was poor corporate governance of the largest banks and other large financial institutions of the United States. This poor governance encouraged the senior managements of these institutions to undertake excessively risky strategies that may have benefitted these managements but that were not in the long-run interests of the shareholder-owners of these institutions. The strategies caused these institutions to "blow up", and the financial crisis followed.

An immediate implication of this narrative is that better corporate governance – a better alignment of the interests of senior management with the interests of their shareholders – would have prevented (or at least ameliorated) the crisis, and that better governance is necessary for the prevention of future such crises. One manifestation of this belief is the inclusion of measures that are intended to improve corporate governance – especially for financial institutions – in the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (P.L. 111-203).

This chapter will argue that this corporate governance narrative is largely misguided and reflects an inadequate understanding of modern finance and financial theory.[1] This lacuna applies to the understanding of the role of debt and therefore leverage in a corporation's capital structure in potentially encouraging the owners of the corporation (who are protected by the

[1] Similar critiques can be found in Carpenter et al. (2011) and Fahlenbrach and Stulz (2011).

"limited liability" that is a part of the legal structure that pertains to corporations) to undertake more risky strategies than they would in the absence of the debt. If senior managements of corporations are properly representing and responding to the interests of their shareholders, then they ought – unless restrained by the debt holders or by prudential regulators – to be undertaking activities that might otherwise appear to be excessively risky.

Accordingly, even if corporate governance is improved in the future, this improvement is unlikely to play a major role in restraining risk-taking and thus avoiding future financial crises. Instead, future avoidance must rely on a different narrative: That excessive risk-taking (which ex ante may well have been in the interests of diversified shareholders) combined with excessive leverage (i.e., inadequate capital) by large, complex, and interconnected financial institutions that were inadequately restrained by prudential regulation was the cause of the crisis. In turn, this calls for forestalling future financial crises the "old-fashioned" way: through heightened, expanded, and improved prudential regulation of these financial institutions, with a special emphasis on higher and better-measured capital requirements.[2]

This chapter will proceed as follows: Because the concept of leverage is central to this chapter – for understanding the motives of corporate owners for excessive risk-taking and thus why poor corporate governance isn't needed to explain the risky behavior and also why prudential regulation is appropriate for these large financial institutions – Section II will review the concept and its implications, as well illustrating the closely related concept of "capital" for financial institutions. Section III will bring diversified owners, and then managers and corporate governance, into the discussion. Section IV will provide a brief overview of prudential

[2] This line of argument can also be found in Acharya and Richardson (2009), Acharya et al. (2010), and White (2009b, 2010).

regulation and its central role in restraining excessive risk taking by financial institutions. And Section V offers a brief conclusion.

II. Understanding Leverage and Its Implications

A. A balance sheet approach to understanding leverage.

Although this chapter is primarily about financial institutions and their regulation, we will start somewhere else:[3] a stylized balance sheet for a roughly typical manufacturing corporation of the middle of the decade of the 2000s,[4] as portrayed in Figure 1a. That firm has assets of $100, consisting of plant, equipment, inventories, accounts receivable, cash on hand, etc. Its direct obligations to creditors are $60, consisting of loans owed to banks, any bonds owed to bond investors, accounts payable, etc. By simple subtraction, its net worth or owners' equity – the value of its assets minus the value of its direct obligations – is $40.

This firm has a leverage ratio – its ratio of assets to net worth – of 2½ to 1. The sense of the leverage ratio can be seen in Figure 1b: If the firm's assets increase by $10 (to $110) – say, because it makes and retains operating profits of $10, or its assets simply appreciate by $10 – without an increase in its direct obligations, then its net worth also increases by $10 (to $50). Thus a 10% increase in the value of its assets results in a 25% increase in its net worth; this is a notion of "leverage" that is comparable to the high school physics example of a plank and a fulcrum.[5]

Leverage also works in reverse, as in Figure 1c: A 10% decrease in the value of the firm's assets results in a 25% decrease in the value of its net worth.

These simple examples portray an important point: Leverage and the (relative to assets) amount of net worth are inversely related to each other. Further, the relative amount of net worth is important for the lenders/creditors to the corporation because of the strictures of the legal system of "limited liability" for the shareholder-owners: Under limited liability, the shareholders cannot be

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[3] This section draws heavily on White (2009a).

[4] The Internal Revenue Service publishes the aggregated balance sheets of corporations, drawn from their tax filings, in its annual publication Statistics of Income. For 2007 – the latest year for which IRS data are available – the net worth to assets ratio was about 35%. We use the 40% in Figure 1a primarily for simplicity of the arithmetic calculations.

[5] In the United Kingdom and other countries that have a British orientation for their accounting and financial services, the term "gearing" is used to convey the same concept. Since the physics of the transmission of force through a lever and through gears is similar, the use of the two terms to refer to the same balance sheet concept is not surprising.

required to support the company beyond their initial contributions.[6] Thus, in Figures 1a-1c, if the company's assets were to fall below $60 (which would wipe out its net worth) and thus be inadequate to cover the claims of the company's creditors, those creditors normally have no claim against the owners. The creditors will simply have to divide the (inadequate) assets among themselves to satisfy their claims, usually in a bankruptcy proceeding.

There is an important corollary, from the perspective of the owners of the borrowing corporation: Limited liability means that they may not bear the full losses from the "downside" of their corporation's risk-taking, if the losses are so large as to more than wipe out the corporation's net worth. In turn, this limited downside alters the owners' incentives for taking risks: The more that the owners do not bear the downside losses, the greater are their incentives for taking risks, since they get the full gains from the upside but are limited in the losses that they bear.[7] Since net worth is also owners' equity, the extent of net worth is also a measure of the disincentive for the owners to take large risks, since a larger net worth means that the owners have more to lose and are farther away from the limit on their losses that limited liability provides.

Accordingly, from the creditors' perspective, the level of a company's net worth represents the extent of the buffer that protects them against a decrease in the value of the company's assets that would expose them to a loss, as well as an indicator of the owners' disincentive for risk taking. The thicker the buffer (other things being equal), the more assured the creditors should feel.

Creditors to non-financial corporations long ago figured this out: Typically, when a bank makes a loan to a company, there are restrictions in the lending agreement that are intended to prevent the company from taking excessively risky actions, the downside of which would erode the company's net worth and thus place the lending bank at risk; and, as the company's net worth buffer becomes thinner, the bank's restrictions get tighter. Similarly, when a company sells bonds into the

[6] By contrast, for a sole proprietorship or a partnership, the owner or owners are fully liable for the obligations of their company, up to the limits of personal bankruptcy.

[7] Even in the absence of the limited liability protection for corporate shareholders, the limits that are created by personal bankruptcy generate the same kinds of incentives for risk taking.

securities markets, the bond buyers (who are effectively lending their funds to the company) include covenants in the bond indenture that place the same kinds of restrictions on a company's actions.[8]

B. Leverage and financial institutions.

The same basic ideas apply to a commercial bank or thrift institution: Figure 2a provides the stylized balance sheet of a well capitalized bank or thrift. Its $100 of assets are primarily the loans that it makes and the bonds that it owns. Its direct obligations of $92 are primarily its deposits.[9] And, again, by simple subtraction, it has $8 of net worth or owners' equity. For financial institutions, this net worth is also called "capital". Note that "capital" is not "money", or "cash", or "liquidity". It is net worth.[10] Although a bank can increase its "capital" by getting a "cash injection" from investors, the increase in capital occurs because the additional cash adds to the assets of the bank and therefore to its net worth. If the bank lends or invests the cash (and thus exchanges the cash for an equivalent amount of other assets), its capital is still augmented by the investors' infusion. By contrast, a loan of an equivalent amount of cash to the bank would not increase its capital (and would instead increase its leverage).

Note that this bank has a substantially thinner net worth (capital) buffer than does the manufacturing firm.[11] Equivalently, it is much more leveraged: 12½ to 1. This is illustrated in Figure 2b: A 10% increase in the value of the bank's assets yields a 125% increase in the bank's capital.

Again, leverage also works in reverse, as in Figure 2c: A 10% decrease in the value of the bank's assets more than wipes out its capital and renders it insolvent. A yet larger decrease in the value of its assets yields a yet deeper insolvency, as in Figure 2d.

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[8] Although the financial markets long ago figured this out, the economics/finance literature was relatively late in understanding it. See, for example, Stiglitz and Weiss (1981).

[9] This stylized balance sheet is best representative of a smaller bank or thrift. Larger banks are more likely to have other kinds of direct liabilities, such as bonds or repurchase agreements ("repos"), in addition to deposits.

[10] This is a rough approximation. Especially with respect to prudential regulation, "regulatory capital" includes other balance sheet entries that are not normally considered to be part of net worth.

[11] It is worth noting, however, that there was a time – in the middle of the nineteenth century – when bank capital ratios were in the same range as the net worth ratio of the manufacturing firm of Figure 1a; see, for example, Lown et al. (2000). Capital requirements declined over time to levels today that are in the range of Figure 2a. See also Keeley (1990).

The protections of limited liability apply to the shareholder-owners of banks and other depository institutions as well.[12] Accordingly, the greater leverage of financial institutions provides enhanced incentives for their owners to take risks at the potential expense of their depositor-creditors. Unlike the lender-creditors to non-financial corporations, however, the depositor-creditors to depositories generally do not directly place restrictions on the risk-taking of the banks to which they have entrusted their deposits. Instead, government regulators are the entities that impose these restrictions. In an important sense, prudential regulation of depository institutions by government can be considered to be the public-sector counterpart to the restrictions and covenants that private-sector lender-creditors impose when lending to non-financial corporations.[13]

The balance sheets – and leverage – of two other categories of financial institution (circa 2007) are worth considering. Figure 3 portrays the (stylized) balance sheet of the two "government-sponsored enterprises" (GSEs): Fannie Mae and Freddie Mac. As can be seen, their on-balance-sheet ratio of capital to assets was only 4%; equivalently, their leverage was 25-to-1. This on-balance-sheet portrayal, however, neglects an important additional facet of the GSEs' operations: their issuance of the equivalent of an additional $200 of residential mortgage-backed securities (RMBS). These securities carried the GSEs' guarantees to the RMBS investors that, in the event that the underlying mortgage borrowers defaulted on their obligations, the GSEs would keep the investors whole. If those contingent obligations are included (as they should be, since they represented contingent claims against which the GSEs' capital provided a buffer), their leverage was effectively 75-to-1.

Finally, Figure 4 portrays a (stylized) highly leveraged investment bank. Its $100 in assets are its investments in bonds, loans, shares of stock, real estate, and just about any other asset -- real

[12] Some thrifts and insurance companies are "mutuals" and are (in principle) owned by their depositors or insureds. Similarly, credit unions are owned by their members who are also depositors and borrowers. The principle of limited liability extends to these categories of financial institutions as well, which again places the burden on creditors when the institution's net worth is negative. For these institutions, however, the categories of "creditor" (depositor or insured) may overlap with the category of "owner".

[13] It's worth noting that prudential regulation (prior to 2010) was also applied in the U.S. to bank holding companies, insurance companies, money market mutual funds, defined-benefit mutual funds, and broker-dealers. The Dodd-Frank Act extends prudential regulation to large financial institutions that pose systemic risks more generally. An elaboration on the topic of prudential regulation will be provided in Section IV.

or financial. Its $97 in direct obligations are in the form of loans, bonds, commercial paper, and other obligations. By simple subtraction, it has only $3 in capital. The investment bank's leverage is 33⅓-to-1. For both the GSEs and the investment bank, even modest (percentage) losses in the value of their assets would expose their creditors to losses.

C. Some real-world illustrations.

The balance sheet examples for the categories of financial firms just discussed may seem fanciful. They are not. Table 1 presents the relevant data for the 15 largest financial firms in the U.S. as of year-end 2007.[14] As can be seen, their ratios of net worth (capital) to assets are roughly consistent with the examples.

D. A summing up.

There are a number of clear lessons that emerge from this section:

1) Leverage magnifies the (percentage) gains and losses for the owners of a leveraged enterprise.

2) Leverage plus limited liability may distort the incentives of a corporation's owners toward taking on more risk than would be the case if the owners bore the full burden of the downside losses.

3) The extent of the distortion depends on the amount of the owners' equity (i.e., net worth – or, in the case of a financial institution, its capital) relative to the potential risk-taking activity. If the owners' equity is relatively large and the risks are small, limited liability will have little or no effect on risk taking; conversely, if the owners' equity is small and the risks are large, limited liability may well encourage risk taking that would not otherwise occur if the owners bore the full downside consequences.

This last point is worth driving home with a simple numerical example: Suppose that the manufacturing company of Figure 1a has an opportunity for a "bet" that may (net) yield +$5 or -$5

[14] Year-end 2007 slightly precedes the March 2008 absorption of Bear Stearns by JPMorgan Chase, which was engineered and backed by the Federal Reserve and marked the first major manifestation of the shakiness of the largest, thinly capitalized financial institutions in the U.S.

with equal probability. Since even the downside would be borne entirely by the owners (since their net worth of $40 would easily absorb the loss), then, if they are risk neutral, they would be indifferent to this opportunity (since its expected value is $0); if they are risk averse, they would forgo the opportunity.

Now suppose that the same +$5/-$5 (with equal probability) opportunity is presented to the bank of Figure 2a. Again, the owners will be the full bearers of the downside, and a similar decision calculus should hold.[15]

Finally, suppose that the same +$5/-$5 opportunity is presented to the investment bank of Figure 4. Now the owners gain the full +$5 upside gain, while (because of limited liability) they bear only -$3 of the -$5 loss. The expected value of this opportunity to the owners is now is +$1 (= +$5*0.5 – $3*0.5). Risk-neutral owners should welcome this opportunity; even mildly risk-averse owners should be interested. Equally important, the owners are indifferent to the size of the loss beyond $-3. Whether the possible loss is -$5 or -$50 or -$500 should be of no concern to the owners (so long as the probability of loss stays at 50%), although it would be of great concern to the institution's creditors. In essence, uneconomic opportunities (i.e., with expected values that are negative) would be of interest to the owners.

Section III will expand on these lessons.

[15] The depositors (unless they are covered by deposit insurance) and/or the deposit insurer, however, ought to be concerned by the substantial reduction in net worth that the downside outcome would yield, since there would then be only $3 of net worth, and another such opportunity could lead to the institution's insolvency.

III. Leverage, Owners, Managers, and Governance

The discussion in Section II had no mention of corporate governance. The examples were all in terms of the incentives of the owners themselves. The important lesson is that leverage plus limited liability can alter the incentives of owners toward undertaking greater risk than if the owners bore all of the downside from risk taking.

A. Owners, risk taking, and diversification.

One impediment to greater risk taking might be risk aversion on the part of the owners. Suppose that, in the example at the end of Section II of the +$5/-$5 (with equal probability) opportunity that was posed for the owners of the investment bank of Figure 4, all of the owners' net worths were solely invested in the equity of that institution. In that case, even though limited liability creates a positive expected value of the opportunity for the owners, they might nevertheless be reluctant to embrace it, since it would carry a 50% probability of wiping out their net worths.

Instead, however, suppose that the owners' net worths were spread across many such institutions – that the owners all had diversified portfolios that encompassed dozens of such institutions. Suppose further that each institution had a +$5/-$5 opportunity and that each of these opportunities was uncorrelated with the others – i.e., that the outcome of each opportunity depended solely on its 50/50 equal probability and not on the outcomes of the others. In this case, unless the owners were extremely risk averse, they should want their institutions to embrace the opportunities. On average the owners would gain, and the possibility that they would experience an overall loss would be quite small.[16] In essence, they would harvest the gains and walk away from the losses (and re-diversify their portfolios), with the likelihood of an overall gain's being quite high. Finally, recall that the owners would be unconcerned about the size of the loss and thus would be ready to embrace opportunities that were uneconomic.

[16] If an individual had a diversified portfolio of equal-size investments in 50 such institutions and all 50 undertook these opportunities, then the likelihood of the individual's experiencing any overall loss at all would be only 3.2%, and the likelihood that the individual would experience a loss of 50% or greater to his/her net worth would be only 0.3%.

This last point is worth restating: Diversified owners have no special reasons for preserving the solvency of all of the companies in which they have ownership stakes. Instead, because of the downside protections of limited liability, their interests are for their companies to be operated with the maximum amount of leverage that those companies' creditors and/or regulators will allow and for the companies to embrace risky opportunities that offer positive expected outcomes for the owners, even if the opportunities are uneconomic when the creditors' losses are included and the downside outcomes would mean the insolvency or bankruptcy of some of the companies.

B. Managers and governance.

Let us now introduce a set of senior managers that are employed by the owners. In so doing we have now created the potential issue of corporate governance: Will the senior managers faithfully manage the corporation in the interests of the owners?[17]

There are at least three possible answers to this question that are relevant to our discussion of risk taking:[18] 1) Yes they will; 2) No they won't; they will take excessive risks; or 3) No they won't, they will refrain from taking risks that would be in the interests of diversified owners. We will address each possibility in turn:

1. Yes they will. It is first worth considering the possibility (e.g., because of an appropriate incentive structure) that the managers do faithfully operate the company in the interests of its owners. In this case, as the earlier part of this Section and the previous Section have argued, a diversified set of owners will want the managers to operate their companies at the maximum leverage that the companies' creditors and/or regulators will allow and to embrace risky opportunities that embody positive expected values for the owners even if (because of limited liability) the opportunities are not economic (i.e., because the expected downside outcomes, including the losses to creditors, exceed the expected upside gains to the owners).

[17] Consideration of this issue extends back at least to Berle and Means (1932). Modern economics and finance consideration of it can be dated to Jensen and Meckling (1976) and Fama and Jensen (1983).

[18] We focus here on governance with respect to risk taking. There are, of course, additional dimensions to the governance question, such as whether the senior managers may make simple choices (such as whether to merge with another company) that favor senior managers (who get more prestige, as well as more pay, from running a larger company) at the expense of owners (if the merged company is less profitable).

Thus, even good governance will not rein in uneconomic risk taking.

2. No they won't; they will take excessive risks. It is surely possible that, because of poorly structured incentives and inadequate monitoring, that the company's managers might embrace risky opportunities that rewarded the managers but that were uneconomic for the owners. This seems to be the case that is envisioned by those who believe in the "poor corporate governance" narrative for the financial crisis and thus by the authors of the corporate governance sections of the Dodd-Frank Act.

In this case, better governance may reduce uneconomic risk taking – but the lesson of #1 is that better governance alone will not be sufficient to eliminate all uneconomic risk taking. Further, there is evidence that the risk taking by the large U.S. financial institutions prior to the crisis of 2007-2009 was, ex ante, in the interests of the shareholder owners of these corporations.[19]

3. No they won't; they will refrain from taking risks that would be in the interests of diversified owners. It is worth considering the third possibility: That managers might refrain from embracing risky opportunities that would otherwise be in the interests of the owners. Consider one of the standard reward structures for managers: They receive performance-based bonuses in the form of stock grants or stock options. If the managers are restricted from quickly selling the stock or options, then their portfolios are likely to become heavily unbalanced in the direction of their ownership position in their company; i.e., they are unlikely (unless they are independently wealthy) to be well diversified. In that case, the managers become similar to the undiversified owners that were described in the early part of this Section: If the managers are risk averse, they may be reluctant to take the big risks that would have a positive expected value for the diversified owners, because the downside of those risks might greatly reduce the (undiversified) managers' net worths.

In this case, ironically, poor governance serves to rein in excessive risk taking.

C. A summing up.

[19] Fahlenbrach and Stulz (2011), for example, find that the actions of the senior managers of the large U.S. financial institutions prior to the crisis appear to have been in the ex ante interests of their shareholder owners.

It is clear that good corporate governance is far from a panacea for reining in excessive risk taking by financial corporations. At best (case #2 above), it might help a little bit.

In short, something more than better corporate governance is needed to restrain excessive risk taking by financial institutions. That something more is prudential regulation, to which we now turn.

IV. Prudential Regulation.

"Financial regulation" encompasses a wide range of activities and goals.[20] In this section we will focus on prudential regulation:[21] the regulatory effort to maintain the solvency of financial institutions. As was noted earlier, prudential regulation has been applied to a number of categories of financial institutions; however, we will confine our attention to the prudential regulation of depository institutions (which, for the purposes of brevity, we will describe as "banks").[22]

A. The arguments for prudential regulation.

The arguments for the prudential regulation of banks start with the leverage and limited liability arguments of Section II. It's clear that creditors to a corporation need to be protected against the risk-taking incentives of the corporation's owners. For non-financial corporations, the creditors are expected to protect themselves. But for banks (and a number of other categories of financial institution) the creditors – for banks, they are primarily the depositors – are seen as unable to protect themselves adequately. Hence, there is a longstanding tradition – in the U.S., this tradition extends back at least to the 1860s[23] – of having government prudential regulation as the substitute protector for the depositors.

The arguments, specifically, for government prudential regulation of banks (instead of relying on depositors to protect themselves through covenants or other negotiated restrictions) are:

1) Banks are complex and difficult to understand – except (hopefully) by experts – even under the best of circumstances.[24]

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[20] In addition to prudential regulation, "financial regulation" can encompass efforts to protect consumers from "toxic" (harmful) financial products and services, protect them from fraud, require adequate information about financial products and services or about the finances of publicly traded companies, limit directly the prices and fees that can be charged by financial institutions, etc.

[21] In the U.S. the traditional phrase for this type of regulation has been "safety-and-soundness" regulation. Outside of the U.S., however, "prudential" regulation has been the common term, and it is now widely used in the U.S. as well.

[22] Many of the arguments for and instruments of the prudential regulation of banks have their counterparts in the prudential regulation of other financial institutions.

[23] The National Currency Act of 1863 and the National Bank Act of 1864 created a national charter for banks and a national prudential regulator – the Comptroller of the Currency – to regulate them. Even before then, the states as charterers of banks saw banks as special and restricted their activities. Further, where states had created state-backed systems of deposit insurance – New York was the first to do so in 1829 – they realized that they needed a system of regulation to try to contain the activities of banks that could put the deposit insurance system at risk.

[24] Morgan (2003) empirically demonstrates the validity of this argument.

2) Depositors – even commercial (i.e., business) depositors – tend to be relatively unsophisticated with respect to understanding the activities and finances of banks.

3) The primary liabilities that are issued by banks tend to be short-term demandable deposits, which the depositors expect to be liquid and available at short notice at par (i.e., they don't expect to bear losses); equivalently, there ought to be a safe place that relatively unsophisticated individuals (and businesses) can keep their money (and savings), as an alternative to cash that is stored in cookie jars or under mattresses.[25]

4) Typically, there are large numbers of depositors in a bank, and the levels/amounts of their deposits vary over time. Coordination among them, so as to agree on a set of covenants to impose on their bank – and to agree on who should do the necessary monitoring -- would be far more difficult than is the case for bond covenants (where there is typically a trustee, as well as a few dominant block holders of the bonds that have been issued by any company) or bank loans to non-financial corporations (where there is typically a single bank or a consortium of a few banks).

5) Because of #1-4, banks are susceptible to runs:[26] If some depositors are unsure about the value of the bank's assets but are worried that the assets may be inadequate to satisfy all depositors' claims, those depositors may want to "run" to the bank to withdraw their funds before other depositors get the same idea. Other depositors, seeing or hearing about the first group's actions, may similarly rush to withdraw their funds.

This general depositor "run" on the bank can be exacerbated by the realization that even a solvent bank is relatively illiquid, in the sense that it has loaned out almost all of the depositors' funds and keeps only a small amount of cash on hand to deal with "normal" withdrawals. (Think of Jimmy Stewart's efforts, in the movie "It's a Wonderful Life," to stop his depositors' run by explaining to them that their money is not in the till but has been loaned to their neighbors.)

[25] This last version is really an argument for deposit insurance; but then the deposit insurer would want a system of prudential regulation to protect itself.

[26] More formal discussions can be found in Diamond and Dybvig (1983), Postlewaite and Vives (1987), and Chen (1999).

And, if depositors in the bank across the street see the run on the first bank and they fear that the same problems may apply to their bank as well, the depositors in this second bank may start a run on their bank. Thus can a "contagion" or "cascade" of bank runs can develop.[27]

6) Since a bank that is subject to a run by its depositors cannot satisfy all of their demands for cash withdrawals, the bank must either close (declare bankruptcy or its equivalent) or suspend payment until it can liquidate its assets.[28] Either of these outcomes would be unsatisfactory to depositors, which can serve to heighten fears and exacerbate runs.

7) The closure of a bank because of insolvency will impose losses on relatively unsophisticated depositors. These losses may be considered to be unacceptable politically (as well as exacerbating the depositor nervousness that leads to runs).

8) The closure of a bank and the liquidation of its assets – which will mean the calling in (i.e., requiring repayment) of its loans – may deprive local households and businesses of a significant source of credit. Even if there are alternative lending sources, the specialized knowledge that the bank has developed as to who is a creditworthy borrower (and who is not) may be lost, to the detriment of those creditworthy borrowers (who, at a minimum, will have to demonstrate their creditworthiness to another potential lender).[29]

The roles of a prudential regulator, a central bank, and deposit insurance in maintaining a stable banking system can now be seen. Prudential regulation is intended to prevent the bank from becoming insolvent and thereby prevent depositors from being exposed to losses.[30] The central bank can lend (provide liquidity) to an otherwise illiquid but solvent bank, to help the bank deal with any temporary nervousness that might develop among its depositors.[31] And deposit insurance

[27] As became clear in September 2008, similar "runs" were possible by the short-term creditors to the thinly capitalized large investment banks in the U.S.

[28] And even for a solvent bank, the forced liquidation of its assets would likely yield losses and thus render it insolvent, generating losses for even the patient depositors.

[29] For example, Bernanke (1983) demonstrated that this was one of the major costs of the thousands of bank closures that accompanied the U.S. economy's descent into the Great Depression of the 1930s.

[30] For a skeptical view as to the efficacy of prudential regulation, especially outside of the U.S. context, see Barth et al. (2006).

[31] Of course, in lending to the bank, the central bank becomes a creditor to the bank; at a minimum the central bank will want adequate collateral for its loan, and, more generally, it will want to assure itself of the solvency of the bank to which it is lending.

provides a back-up reassurance to depositors and thus serves as an additional; backstop against bank runs, in the event that prudential regulation has failed to prevent the bank's insolvency.[32]

B. The primary tools of prudential regulation.

1. Capital adequacy. Since the goal of prudential regulation is to maintain the solvency of banks – i.e., to ensure that they have positive levels of capital – minimum capital levels (relative to the risks that are undertaken by the bank) are at the heart of any system of prudential regulation.[33] Equivalently (as is clear from Section II), this means limits on leverage.

For all financial institutions, capital levels are so thin that accurate measurements of the value of the institution's assets -- and thus of its capital (because capital is determined by simple subtraction) -- are crucial. An accounting system that relies primarily on market values for the determination of asset values (with some allowance for the vagaries of thin markets), rather than on historical costs or on projected cash flows, is essential.

As a bank's capital buffer gets thinner, prudential regulators should progressively restrict its activities. At the limit of insolvency, the regulator must declare a receivership and take full control of the bank (see #6 below). This system of progressive restrictions has come to be called "prompt corrective action."

2. Activities limitations. In principle, if prudential regulators could accurately ascertain the risks of all potential activities by a bank – including non-financial activities, such as owning and operating an automobile manufacturing facility, or a large department store – and could thereby assign the appropriate capital levels, then there would be no need for any restrictions on the activities of banks. More realistically, prudential regulators will be limited in their ability to ascertain the riskiness of most non-financial activities – and perhaps even of some financial activities. If prudential regulators cannot ascertain the riskiness of an activity, that activity ought not to be permitted for a bank.[34]

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[32] For general arguments along these lines, see White (1991).

[33] Included in capital should be a "slice" of subordinated debt and/or debt that converts to equity ("contingent capital") when capital levels decline.

[34] However, that activity may well be appropriate for a non-financial holding company of a bank. See White (2009c) for a general argument along these lines.

3. Managerial competency requirements. The failure of a bank – even a small, local bank – is clearly a more serious event than the failure of a corner delicatessen. Requiring that the senior managers of a bank demonstrate their competency at running a bank naturally follows.[35]

4. Close monitoring of the financial flows between a bank and its owners. Because it is too easy to loot a bank – to extract assets from the bank in a way that benefits its owners but that leaves the liability holders at risk (such as excessive dividends to the owners, or favorable loans to the owners or to their family or their friends) – prudential regulators must closely monitor the financial flows between a bank and its owners (or their family, or their friends).

5. Adequate numbers of well-trained and well-paid regulators. Because prudential regulation involves sophisticated monitoring of sophisticated financial institutions, adequate numbers of well-trained and well-paid personnel to conduct this monitoring are essential.

6. A receivership regime for insolvent banks. Once a bank reaches insolvency, it must be placed in a receivership (usually operated by the regulator or the deposit insurer). The receivership extinguishes the rights of the owners and usually dismisses the senior management who "drove the bank into the ditch." The regulator can then decide whether the best course of action is to liquidate the bank or to find an acquirer.[36]

C. What role for improved governance?

Is there room for improved governance as part of the prudential regulation of banks? The answer is "yes"; but the full nuances of this "yes" should be understood:

First, improvements in governance can, at most, be just a modest part of prudential regulation.

[35] U.S. bank regulators require such competency on the part of the senior management for start-up (denovo) banks. And it remains an occasionally used tool for personnel removal at more seasoned banks.

[36] The operation of a receivership is best envisioned as operating in conjunction with the deposit insurer: The deposit insurer pays off the insured depositors and then must deal with its consequent loss: the negative net worth "hole" of the insolvent bank. The receiver tries to find the best route to maximizing the value of the remaining assets and thus minimizing the size of the deposit insurer's loss.

Second, restraints in managerial risk taking that would otherwise exceed the levels that are in the shareholders' interests are in the interests of the depositors (or the deposit insurer) as well as in the interests of shareholders.

But, third, the necessary restrictions on managerial risk taking so as to enhance the prospects for solvency of the bank require much more extensive restrictions than those that would be in the interests of diversified shareholder owners and thus ought not to be considered to be part of a program of "improved governance".

V. Conclusion

Is there a relationship between corporate governance and the prudential regulation of banks? The answer must be, "Yes; but just barely." If the managers of banks are undertaking risky strategies that are beyond those that are in the interests of the banks' shareholder owners, then improved corporate governance also serves the larger interests of society in preserving the solvency of banks.

But, as this chapter has argued, the diversified shareholder owners will want their managers to undertake considerably more risk than is in society's interests. In that important sense, then, prudential regulation of banks must require bank managers to undertake less risk (and maintain higher levels of capital, etc.) than would otherwise be in their owners' interests. In that sense, good prudential regulation must (ironically) worsen the corporate governance of banks.

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Figure 1a: The Balance Sheet of a Typical Manufacturing Corporation

Assets	Liabilities
$100 (plant, equip., inv., cash, etc.)	$60 (bank loans, bonds issued, accts. payable, etc.)
	$40 (net worth, owners' equity)

Net worth/assets: 40%
Leverage: 2½ / 1

Figure 1b: A Modified Balance Sheet of a Typical Manufacturing Corporation

Assets	Liabilities
$110 ~~$100~~ (plant, equip., *+10%* inv., cash, etc.)	$60 (bank loans, bonds issued, accts. payable, etc.)
	$50 ~~$40~~ (net worth, owners' *+25%* equity)

Net worth/assets: 45%
Leverage: 2.2 / 1

Figure 1c: Another Modified Balance Sheet of a Typical Manufacturing Corporation

Assets	Liabilities
$90 ~~$100~~ (plant, equip., *-10%* inv., cash, etc.)	$60 (bank loans, bonds issued, accts. payable, etc.)
	$30 ~~$40~~ (net worth, owners' *-25%* equity)

Net worth/assets: 33%
Leverage: 3 / 1

Figure 2a: The Balance Sheet of a Well Capitalized Bank or Thrift

Assets	Liabilities
$100 (loans, bonds, investments)	$92 (deposits)
	$8 (net worth, owners' equity, capital)

Capital/assets: 8%
Leverage: 12½ / 1

Figure 2b: A Modified Balance Sheet of a Well Capitalized Bank or Thrift

Assets	Liabilities
$110 ~~$100~~ (loans, bonds, investments) *+10%*	$92 (deposits)
	$18 ~~$8~~ (net worth, owners' equity, capital) *+125%*

Capital/assets: 16%
Leverage: 6.1 / 1

Figure 2c: A Balance Sheet of an Insolvent Bank or Thrift

Assets	Liabilities
$90 ~~$100~~ (loans, bonds, investments) *-10%*	$92 (deposits)
	$-2 ~~$8~~ (net worth, owners' equity, capital) *-125%*

Capital/assets: ?
Leverage: ?

Figure 2d: The Balance Sheet of a Deeply Insolvent Bank or Thrift

Assets	Liabilities
$70 (loans, bonds, investments)	$92 (deposits)
	$-22 (net worth, owners' equity, capital)

Capital/assets: ?
Leverage: ?

Figure 3: The Balance Sheet of Fannie Mae or Freddie Mac

Assets	Liabilities
$100 (residential mortgages)	$96 (bonds, loans, c.p.)
	$4 (net worth, owners' equity, capital)

plus $200 of issued RMBS carrying the GSEs' guarantees

Capital/assets: 4% (1⅓% if RMBS guarantees are included)
Leverage: 25 / 1 (75 / 1 if RMBS guarantees are included)

Figure 4: The Balance Sheet of a Highly Leveraged Investment Bank

Assets	Liabilities
$100 (loans, bonds, stocks, real estate, investments)	$97 (bonds, loans, com. paper)
	$3 (net worth, owners' equity, capital)

Capital/assets: 3%
Leverage: 33⅓ / 1

Table 1: The Fifteen Largest Financial Institutions in the U.S., 2007
(by asset size, December 31, 2007)

Rank	Financial institution	Category	Assets ($ billion)	Equity as a % of assets
1	Citigroup	Commercial bank	$2,182	5.2%
2	Bank of America	Commercial bank	1,716	8.6
3	JPMorgan Chase	Commercial bank	1,562	7.9
4	Goldman Sachs	Investment bank	1,120	3.8
5	American International Group	Insurance conglomerate	1,061	9.0
6	Morgan Stanley	Investment bank	1,045	3.0
7	Merrill Lynch	Investment bank	1,020	3.1
8	Fannie Mae	GSE	883	5.0
9	Freddie Mac	GSE	794	3.4
10	Wachovia	Commercial bank	783	9.8
11	Lehman Brothers	Investment bank	691	3.3
12	Wells Fargo	Commercial bank	575	8.3
13	MetLife	Insurance	559	6.3
14	Prudential	Insurance	486	4.8
15	Bear Stearns	Investment bank	395	3.0

Note: The Federal Home Loan Bank System ($1,272B in 2007) and TIAA-CREF ($420B in 2007) have been excluded from this list; if GE Capital were a standalone finance company, its asset size ($650B in 2007) would place it at #12.

Source: Fortune 500, May 5, 2008, and the Federal Housing Finance Agency (for Fannie Mae and Freddie Mac).