CHAPTER 3
Financial Innovation, Regulation, and Reform
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Financial innovations often respond to regulation by sidestepping regulatory restrictions that would otherwise limit activities in which people wish to engage. Securitization of loans (for example, credit card receivables or subprime residential mortgages) is often portrayed, correctly, as having arisen in part as a means of “arbitraging” regulatory capital requirements by booking assets off the balance sheets of regulated banks. Originators of the loans were able to maintain lower equity capital against those loans than they would have needed to maintain if the loans had been placed on their balance sheets.¹

¹ Financial innovations involving regulatory arbitrage can be complex. Securitized assets implicitly often remain connected to the balance sheet of the bank that originated them, despite the fact that the liabilities issued by the securitization conduits are not legally protected by the originating bank; lenders not only provide explicit credit enhancements to their off-balance-sheet conduits, but also offer implicit “guarantees” to the market. These implicit guarantees are valued by the market, which expects originators to voluntarily stand behind the securitized debts of their off-balance-sheet conduits, at least under most circumstances. This phenomenon is known as implicit recourse (see Calomiris and Mason 2004).
Capital regulation of securitization invited this form of off-balance-sheet regulatory arbitrage and did so quite consciously. Several of the capital requirement rules for the treatment of securitized assets originated by banks, and for the debts issued by those conduits and held or guaranteed by banks, were specifically and consciously designed to permit banks to allocate less capital against their risks relating to those conduits than they would have had to maintain against similar risks held on their balance sheets (Calomiris 2008b). Critics of these capital regulations have rightly pointed to these capital requirements as having contributed to the subprime crisis by permitting banks to maintain insufficient amounts of equity capital per unit of risk undertaken in their subprime holdings.

Capital regulations that were less strict than those applying to commercial banks permitted investment banks to engage in subprime-related risk with insufficient budgeting of equity capital. Investment banks faced capital regulations under Securities and Exchange Commission guidelines that were similar to the more permissive Basel II rules that apply to commercial banks outside the United States. Because those capital regulations were less strict than capital regulations imposed on U.S. banks, investment banks were able to leverage their positions more than commercial banks. Investment banks’ use of overnight repurchase agreements as their primary source of finance also permitted them to “ride the yield curve” when using debt to fund their risky asset positions; in that respect, collateralized repos appeared to offer a substitute for low-interest commercial bank deposits. But as the collateral standing behind those repos declined in value and became risky, “haircuts” associated with repo collateral became less favorable, and investment banks were unable to roll over their repo positions, a liquidity risk that added to their vulnerability and made their equity capital positions even more insufficient as risk buffers.

There is no doubt that the financial innovations associated with securitization and repo finance were motivated at least in part by regulatory arbitrage. Furthermore, there is no doubt that if on-balance-sheet commercial bank capital regulations had determined the amount of equity budgeted by all subprime mortgage originators, then the leverage ratios of the banking system would not have been so large and the liquidity risk from repo funding would have been substantially less, both of which would have reduced the magnitude of the financial crisis.

Yet I do not agree with those who argue that the subprime crisis is mainly a story of government “errors of omission,” which allowed banks to avoid regulatory discipline due to the insufficient application of existing regulations for on-balance-sheet commercial bank capital to the risks undertaken by investment banks and off-balance-sheet conduits. The main story of the subprime crisis instead is one of government “errors of commission,” which were far more important in generating the huge risks and large losses that brought down the U.S. financial system.

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2 Repos grew so quickly that they came to exceed in size the total assets of the commercial banking system, as discussed in Gorton (2009).
What Went Wrong and Why?

The subprime crisis reflected first and foremost the willingness of the managers of large financial institutions to take on risks by buying financial instruments that were improperly priced, which made the purchases of these instruments contrary to the interests of the shareholders of the institutions that invested in them. As Calomiris (2008b) shows, on an ex ante basis, risk was substantially underestimated in the market during the subprime boom of 2003–07. Reasonable forward-looking estimates of risk were ignored intentionally by senior management of financial institutions, who structured compensation packages to maximize the incentives for asset managers to undertake these underestimated risks. In the absence of “regulatory arbitrage,” budgeting a little more regulatory capital would have reduced the amount of risk undertaken and given the system a larger cushion for managing its losses, but the huge losses from underestimated subprime risk still would have occurred.

The risk-taking mistakes of financial managers were not the result of random mass insanity; rather, they reflected a policy environment that strongly encouraged financial managers to underestimate risk in the subprime mortgage market. Risk taking was driven by government policies; government actions were the root problem, not government inaction. How do government policy actions account for the disastrous decisions of large financial institutions to take on unprofitable subprime mortgage risk? In what follows, I review each of the major areas of government policy distortions and how they encouraged the conscious undertaking of underestimated risk in the market (see also Calomiris 2008a, 2008b; Calomiris and Wallison 2008; Eisenbeis 2008).

Four categories of government error were instrumental in producing the crisis. First, lax Fed interest rate policy, especially from 2002 through 2005, promoted easy credit and kept interest rates very low for a protracted period. The history of postwar monetary policy has seen only two episodes in which the real Fed funds rate remained negative for several consecutive years; those periods are the high-inflation episode of 1975–78 (which was reversed by the anti-inflationary rate hikes of 1979–82) and the accommodative policy environment of 2002–05. According to the St. Louis Fed, the Federal Reserve deviated sharply from its “Taylor rule” approach to setting interest rates during the 2002–05 period; Fed fund rates remained substantially and persistently below the levels that would have been consistent with the Taylor rule, even if that rule had been targeting 3 or 4 percent long-run inflation.

Not only were short-term real rates held at persistent historic lows, but because of peculiarities in the bond market related to global imbalances and Asian demands for medium- and long-term U.S. treasuries, the treasury yield curve was virtually flat during the 2002–05 period. The combination of low short-term rates and a flat yield curve meant that long-term real interest rates on treasury bonds (which are the most relevant benchmarks
for setting rates for mortgages and other long-term fixed-income assets) were especially low relative to their historic norms.

Accommodative monetary policy and a flat yield curve meant that credit was excessively available to support expansion in the housing market at abnormally low interest rates, which encouraged overpricing of houses. There is substantial empirical evidence showing that when monetary policy is accommodative, banks charge less for bearing risk (reviewed in Calomiris 2008b), and this seems to be a pattern common to many countries in the present and the past. According to some industry observers, low interest rates in 2002–05 also encouraged some asset managers (who cared more about their fees than about the interests of their clients) to attract clients by offering to maintain preexisting portfolio yields notwithstanding declines in interest rates; that financial alchemy was only possible because asset managers decided to purchase very risky assets and pretend that they were not very risky.

Second, numerous government policies specifically promoted subprime risk taking by financial institutions. Those policies included (a) political pressures from Congress on the government-sponsored enterprises (GSEs)—Fannie Mae and Freddie Mac—to promote “affordable housing” by investing in high-risk subprime mortgages, (b) lending subsidies policies via the Federal Home Loan bank system to its member institutions that promoted high mortgage leverage and risk, (c) Federal Housing Administration (FHA) subsidization of high mortgage leverage and risk, (d) government and GSE mortgage foreclosure mitigation protocols that were developed in the late 1990s and early 2000s to reduce the costs to borrowers of failing to meet debt service requirements on mortgages, and, almost unbelievably, (e) 2006 legislation that encouraged rating agencies to relax their standards for measuring risk in subprime securitizations.

All of these government policies encouraged the underestimation of subprime risk, but the politicization of Fannie Mae and Freddie Mac and the actions of members of Congress to encourage reckless lending by the GSEs in the name of affordable housing were arguably the most damaging policy actions leading up to the crisis. In order for Fannie and Freddie to maintain their implicit (now explicit) government guarantees on their debts, which contributed substantially to their profitability, they had to cater to the political whims of their masters in the government. In the context of recent times, that meant making risky subprime loans (Calomiris 2008a; Calomiris and Wallison 2008). Fannie and Freddie ended up holding $1.6 trillion in exposure to toxic mortgages, which constitutes half of the total non-FHA outstanding amount of toxic mortgages (Pinto 2009).

A review of e-mail correspondence between risk managers and senior management at the GSEs reveals that those positions were taken despite the objections of risk managers, who viewed them as imprudent and who predicted that the GSEs would lead the rest of the market into huge overpricing of risky mortgages (Calomiris 2008a). Indeed, it is likely that absent the involvement of Fannie and Freddie in aggressive subprime buying beginning
in 2004, the total magnitude of toxic mortgages originated would have been less than half the actual amount, since Fannie and Freddie crowded market participation in more than they crowded it out.

What aspects of GSE involvement in the market suggest that, on net, they crowded in, rather than crowded out, private investment in subprime and Alt-A mortgages? First, the timing of GSE involvement was important. Their aggressive ramping up of purchases of these products in 2004 coincided with the acceleration of growth in subprime mortgages. Total subprime and Alt-A originations grew from $395 billion in 2003 to $715 billion in 2004, reaching more than $1 trillion in 2005 (Calomiris 2008b: table 2). Furthermore, the GSEs stayed in these markets long after the mid-2006 flattening of house prices, which signaled to many other lenders the need to exit the subprime market; during the last year of the subprime and Alt-A origination boom, when originations remained near peak levels despite clear evidence of impending problems, the GSEs were crucial in maintaining financing for subprime and Alt-A securities.

The GSEs also were uniquely large and protected players in the mortgage market (due to their GSE status) and thus could set standards and influence pricing in ways that other lenders could not. These unique qualities were noted by Freddie Mac’s risk managers when they referred to Freddie’s role in “making a market” in no-docs mortgages. After 2004, and continuing long after the subprime market turned down in 2006, originators of subprime and Alt-A mortgages knew that the GSEs stood ready to buy their poorly underwritten instruments, and this GSE legitimization of unsound underwriting practices gave assurance to market participants that there was a ready source of demand for the new product. That assurance had important consequences both for initially accelerating and later maintaining the large flow of subprime and Alt-A mortgage deals and for promoting the overpricing and overleveraging of these instruments. That market-making role of the GSEs had consequences for the expansion of the market and the pricing of subprime and Alt-A mortgages and mortgage-backed securities that exceeded the particular securities purchased or guarantees made by the GSEs.

Third, government regulations limiting who can buy stock in banks made effective corporate governance within large financial institutions virtually impossible, which allowed bank management to pursue investments that were unprofitable for stockholders in the long run, but very profitable for management in the short run, given the short time horizon of managerial compensation systems.

Pensions, mutual funds, insurance companies, and banks are restricted from holding anything but tiny stakes in any particular company, which makes these informed professional investors virtually impotent in promoting any change within badly managed firms. Hostile takeovers, which often provide an alternative means of discipline for mismanaged nonfinancial firms, are not a feasible source of discipline for financial companies; banks are service providers whose franchise consists largely of human capital, and
the best parts of that human capital can flee to competitors as soon as nasty takeover battles begin (a poison pill even better than standard takeover defenses). What about the possibility that a hedge fund or private equity investor might intervene to become a major blockholder in a financial firm and try to change it from within? That possibility is obviated by the Bank Holding Company Act, which prevents any entity with a controlling interest in a nonfinancial company from acquiring a controlling interest in a bank holding company (the definition of the size of a controlling interest was relaxed in the wake of the 2008 crisis to encourage more block holding, but that change was too little and too late).

When stockholder discipline is absent, managers are able to set up the management of risk within the firms they manage to benefit themselves at the expense of stockholders. An asset bubble (like the subprime bubble of 2003–07) offers an ideal opportunity; if senior managers establish compensation systems that reward subordinates based on total assets managed or total revenues collected without regard to risk or future potential loss, then subordinates have an incentive to expand portfolios rapidly during the bubble without regard to risk. Senior managers then reward themselves for having overseen that “successful” expansion with large short-term bonuses and make sure to cash out their stock options quickly so that a large portion of their money is safely invested elsewhere by the time the bubble bursts.

Fourth, prudential regulation of commercial banks by the government has proven to be ineffective. That failure reflects (a) problems in measuring bank risk resulting from regulation’s ill-considered reliance on credit-rating agencies’ assessments and internal bank models to measure risk and (b) the too-big-to-fail problem (Stern and Feldman 2004), which makes it difficult to enforce effective discipline on large, complex banks, even if regulators detect that they have suffered large losses and accumulated imprudently large risks.

With respect to the former, I reiterate that the risk measurement problem is not merely that regulators and their rules regarding securitization permitted the booking of subprime risks off of commercial bank balance sheets; the measurement of subprime risk, and the capital budgeted against that risk, would still have been much too low if all the subprime risk had been booked entirely on commercial bank balance sheets. Regulators utilize different means to assess risk, depending on the size of the bank. Under the simplest version of regulatory measurement of bank risk, subprime mortgages have a low asset risk weight (50 percent that of commercial loans), even though they are much riskier than most bank loans. The more complex measurement of subprime risk (applicable to larger U.S. banks) relies on the opinions of rating agencies or the internal assessments of banks, and it should come as no surprise that neither of those assessments is independent of bank management.

Rating agencies, after all, are supposed to cater to buy-side market participants, but when their ratings are used for regulatory purposes, buy-side participants reward rating agencies for underestimating risk, since that helps the
buy-side clients to avoid regulation. Many observers wrongly believe that the problem with rating agencies’ grade inflation of securitized debts is that the sellers of these debts (sponsors of securitizations) pay for ratings; on the contrary, the problem is that the buyers of the debts want inflated ratings because they receive regulatory benefits from those inflated ratings.

The too-big-to-fail problem relates to the lack of credibility of regulatory discipline for large, complex banks. For small banks, the failure to manage risk properly results in “intervention” by regulators, under the Federal Deposit Insurance Corporation Improvement Act (FDICIA) framework established in 1991, which forces the sale or liquidation of insufficiently capitalized banks. But for large, complex banks, the prospect of intervening is so potentially disruptive to the financial system that regulators have an incentive to avoid intervention. The incentives that favor “forbearance” can make it hard for regulators to ensure compliance.

The too-big-to-fail problem magnifies the so-called moral hazard problem of the government safety net; banks that expect to be protected by deposit insurance, Fed lending, and Treasury-Fed bailouts and that believe they are beyond discipline will tend to take on excessive risk, since the taxpayers share the costs of that excessive risk on the downside. And just as important, banks that are protected by the government from the discipline of the marketplace will be too tolerant of bad management, since managerial errors that are normally punished by failure will be hidden under the umbrella of government protection.

The moral hazard of the too-big-to-fail problem was clearly visible in the behavior of the large investment banks in 2008. After Bear Stearns was rescued by a Treasury-Fed bailout in March, Lehman Brothers, Merrill Lynch, Morgan Stanley, and Goldman Sachs sat on their hands for six months awaiting further developments (that is, either an improvement in the market environment or a handout from Uncle Sam). In particular, Lehman did little to raise capital or shore up its position. But when conditions deteriorated and the anticipated bailout failed to materialize for Lehman in September 2008—showing that there were limits to Treasury-Fed generosity—the other major investment banks immediately either were acquired or transformed themselves into commercial bank holding companies to increase their access to government support.

The too-big-to-fail moral hazard problem is not a natural consequence of the existence of large, complex institutions. Like the other policy failures enumerated here, it reflects government decisions. In the case of too-big-to-fail, the government has made two key errors. First, protection has been offered too frequently (for example, the bailout of Continental Bank in 1984 was not justified by plausible “systemic risk” concerns); some of the moral hazard cost associated with too big to fail could be eliminated just by being more selective in applying the doctrine. Second, if the government did more to create a credible intervention and resolution process for large, complex banks that become troubled, then much of the cost of too big to fail could be eliminated. If, for example, the government required that a feasible
and credible intervention plan be maintained on an ongoing basis for every large, complex institution, then it would not need to forbear from intervening in such institutions when they become deeply undercapitalized.

To be feasible and credible, an intervention plan would have to ensure the seamless continuing operation and funding of the institution’s lending and other important market transactions and would have to define in advance loss-sharing arrangements among the subsidiaries within the organization that deal with one another (and those loss-sharing arrangements would have to be approved in advance by the various countries’ regulators in which the subsidiaries are located). One of the most intractable problems of complex, globally diverse banks is defining loss-sharing arrangements across borders in the midst of a financial crisis. Bankruptcy procedures appear to be too cumbersome for dealing with the smooth transfer of control and funding, and the lack of a prearranged agreement among regulators about loss sharing means that bankruptcy (as in the case of Lehman) can entail complex, protracted adjudication of intersubsidiary claims in many different legal venues.

The “bridge bank” structure exists in the United States and a few other countries as a means of transitioning to new control and funding sources, but this structure has not been used during the subprime crisis, perhaps because it is too difficult to define its structure and determine loss-sharing arrangements across subsidiaries after the fact. The primary policy failure relating to too-big-to-fail problems is not the decision to forbear from intervening in the midst of the crisis, but rather the decision not to prepare properly for the eventuality of having to intervene.

In summary, the greatest threats that financial sector policy must confront have to do with the ways in which government policy shapes the rules of the game to promote willfully excessive, value-destroying risks. The pursuit of value-destroying risks arises most easily during moments of accommodative monetary policy, and the low-interest-rate environment of 2002–05 was among the most accommodative in U.S. history. Value-destroying risk taking during the recent subprime mortgage boom and bust was motivated by (1) political pressures to lend unwisely (for example, the pressures that led Fannie and Freddie to pursue the expansion of “affordable housing,” despite its costs to taxpayers and unwitting home buyers), (2) bank agency problems (that is, policies that allow bankers to avoid stockholder discipline in pursuit of their own self-interest), and (3) safety net protections (including too-big-to-fail policies) that make value-destroying risks personally beneficial to financiers and their stockholders.

**Regulatory Reform for a World Populated by Humans**

One response to the litany of woe outlined above is to suggest that the raft of government distortions that produce financial sector disasters should be eliminated. If there were no government safety nets, no government
manipulation of credit markets, no leverage subsidies, and no limitations on the market for corporate control, one could reasonably argue against the need for prudential regulation. Indeed, the history of financial crises shows that in times and places where these government interventions were absent, financial crises were relatively rare and not very severe (Calomiris 2007).

That laissez-faire argument, however, neglects two counterarguments. First, substantial negative externalities may be associated with bank risk management. Part of the benefit from one bank’s reduction of its risk is shared by other banks (since the failure of one large institution can have repercussions for others), and this implies that if banks are left to their own devices, they will choose levels of risk that are higher than the socially optimal levels.

Second, it is not very helpful to suggest regulatory changes that are far beyond the feasible bounds of the current political environment. It is useful to point to the desirability of many simultaneous fundamental reforms of government policy, but it is also useful to outline a policy reform strategy for a world that is not amenable to the reasoned arguments of libertarian economists. Absent the elimination of government safety nets, government credit subsidies, and government limits on corporate control, government prudential regulation is a must, even for those who are not convinced by the argument regarding risk management externalities. Until and unless these three categories of existing government distortions are eliminated, we must mitigate their harmful effects by establishing effective prudential regulations.

If one is going to design a regulatory system that works in the presence of these various distortions, it will have to be designed on the basis of principles that transcend the mathematics of finance. As Barth, Caprio, and Levine (2006) rightly note, bankers are not angels, and neither are bank regulators or members of Congress or cabinet secretaries. Bank managers often are willing to take advantage of stockholders or game the government safety net. Regulators are corruptible, particularly when they are threatened by superiors who encourage them to follow the path of least political resistance. Politicians will pressure banks to make unprofitable loans and will be too generous in their construction of bank safety nets because constituencies reward them for doing so.

Successful bank regulation takes into account these human failings and devises mechanisms that succeed reasonably well in spite of them. The trick in regulatory reform is to use the public outrage during a moment of crisis as an opportunity to pass robust reforms that will work after the crisis is over and the threats of political influence, safety nets, and managerial agency have returned. That is not easy, but experience and empirical evidence suggest that some solutions to these problems are more successful than others.

In the remainder of this essay, I review several ideas for regulatory reform that are desirable not only because they make sense technically as ways to
measure and manage risk, but also because they affect the incentives of bankers and bank regulators; in other words, because they are relatively robust to the government policy problems and human failings at the heart of the subprime crisis. This is not an exhaustive review of financial regulation or even banking regulation. My focus is on the structure and content of bank prudential regulation, with an emphasis on how to structure regulatory mechanisms that would improve the effectiveness of the measurement and management of risk in the banking system.

I review six categories of policy reform that would address weaknesses of the policy environment that gave rise to the subprime crisis, including those reviewed above. These six areas are (1) smarter “micro prudential” regulation of banks, (2) new ideas for “macro prudential” regulation of bank capital and liquidity standards, (3) the creation of detailed, regularly updated, prepackaged “bridge bank” plans for large, complex financial organizations, (4) reforms to eliminate the distortions in housing finance induced by government policies that encourage high risk and leveraging, (5) reforms that would improve stockholder discipline of banks, and (6) initiatives to encourage greater transparency in derivatives transactions.

Making Micro Prudential Capital Regulation Smarter

Prudential capital regulation refers to regulations that try to measure bank risk and budget capital (equity plus other capital accounts) accordingly to protect against potential loss related to that risk. Micro prudential capital regulation refers to setting capital based on analysis of the circumstances of the individual institution. Below I also consider macro prudential regulation, which refers to the variation over time in the minimum amounts of capital, liquidity, and provisioning for loss required of banks that occurs as a function of the macroeconomic state of the economy.

The two key challenges in micro prudential capital regulation are (1) finding ways to measure accurately the value and riskiness of different assets and (2) ensuring speedy intervention to prevent losses from growing once banks become severely undercapitalized. These are not just technical issues. Banks, supervisors, regulators, and politicians often have incentives to understate losses and risks and to avoid timely intervention. Timely intervention is crucial, however. If subprime risk had been correctly identified in 2005, the run-up in subprime lending in 2006 and 2007 could have been avoided; banks would have had to budget much more capital against those positions, which would have discouraged continuing growth in subprime lending. Furthermore, banks that have experienced large losses often have incentives to increase their risk further, since they have little of their own capital left to lose; that go-for-broke “resurrection” risk taking can only be prevented by regulators if they identify and intervene in severely undercapitalized banks in a timely manner.

How can regulation ensure accurate and timely information about the value and riskiness of assets? The key problem with the current system of measuring asset values and risks is that it depends on bank reporting,
supervisors’ observations, and rating agencies’ opinions. None of those three parties has a strong interest in correct and timely measurement of asset value and risk. Furthermore, even if supervisors were extremely diligent in their effort to measure value and risk accurately, how could they successfully defend low valuations or high estimates of risk that were entirely the result of the application of their models and judgment?

The essence of the solution to this problem is to bring objective information from the market into the regulatory process and to bring outside (market) sources of discipline in debt markets to bear in penalizing bank risk taking. These approaches have been tried with success outside the United States, and they have often worked. With respect to bringing market information to bear in measuring risk, one approach to measuring the risk of a loan is to use the interest rate paid on a loan as an index of its risk. Higher-risk loans tend to pay higher interest. Argentine bank capital standards introduced this approach successfully in the 1990s by setting capital requirements on loans using loan interest rates (Calomiris and Powell 2002). If that had been done with high-interest subprime loans, the capital requirements on those loans would have been much higher.

Another complementary measure would be to require banks to issue some form of credibly uninsured debt. Forcing banks to access uninsured debt markets forces them to meet an external source of market discipline, which means that they have a strong incentive to satisfy market concerns about the value and riskiness of their assets. Furthermore, the interest rates paid on at-risk debts provide valuable information about market perceptions of bank risk (a proverbial canary in the coal mine), which would be immune to manipulation by bankers, supervisors, regulators, or politicians.

Segoviano (2008) shows that the spreads on bank credit default swaps (CDSs) contained very informative market opinions about differences in risk across banks in 2008 and about the mutual dependence among large banks with respect to risk. That experience is not unusual; a large body of evidence supports the efficacy of using market information and discipline to measure and control bank risk. The evidence of the effectiveness of this approach spans many countries and comes from historical as well as current examples.

The Gramm-Leach-Bliley Act of 1999 required the Fed and Treasury to consider that approach in the form of a subordinated debt requirement. A Fed report (Board of Governors 1999) showed that substantial research favored this approach, but lobbying from the big banks to avoid discipline encouraged Treasury Secretary Lawrence Summers and Fed Chairman Alan Greenspan to kill this promising idea. Now is the time to bring this idea back by requiring banks to offer credibly uninsured debt instruments as part of their capital structure. A variety of possible instruments could be required to provide market information about risk and market discipline. The Shadow Financial Regulatory Committee (2000) offered a blueprint of how to structure the rules surrounding a minimum subordinated debt requirement. That proposal, which was written prior to development of the CDS market,
could provide a useful alternative to subordinated debt in the form of the market pricing of credit risk insurance. Flannery (2009) discusses the potential advantages of contingent capital certificates (CCCs)—debts that convert to equity when banks suffer sufficient portfolio losses—rather than straight subordinated debt for this purpose; Flannery argues that CCCs might work better than subordinated debt as a source of information about risk and a form of market discipline, given the greater potential for rapid loss on CCCs when losses become large.

Finally, with respect to the use of credit-rating agencies’ opinions to measure the riskiness of assets held in bank portfolios, given the low likelihood that regulators will be willing to eliminate entirely the use of ratings in favor of reliance on market opinions, there is a second-best alternative reform. Ratings used for regulatory purposes should be provided in numerical form, not as letter grades. Letter grades as forward-looking opinions have no objective meaning that can be evaluated and penalized for inaccuracy after the fact. But numerical estimates of the probability of default (PD) and loss given default (LGD) do have objective, measurable meanings. Rating agencies that provide ratings used by regulators (the so-called nationally recognized statistical rating organizations, NRSROs) should have to provide specific estimates of the PD and LGD for any rated instrument, not just a letter grade.

Rating agencies already calculate and report such statistics retrospectively on instruments that they rate, and presumably their letter grades are meant to translate into forward-looking predictions of these numbers. But requiring NRSROs to express ratings using numbers would alter their incentives to rate risk either too high or too low. If NRSROs were penalized for underestimating risk (say, with a six-month “sit out” from having their ratings used for regulatory purposes), they would have a strong self-interest in estimating risk correctly, since the reduced demand for their services during the sit out would reduce their fee income. It would be easy to devise an algorithm for such a sit out: if an NRSRO’s estimates of either the PD or the LGD are sufficiently low relative to actual experience for a sufficiently long time, they would be punished with a six-month sit out.

Another proposal for making micro prudential regulation smarter would be to raise regulatory requirements for organizations that are large and highly complex. This policy could take the form of a higher capital requirement, a higher provisioning requirement, or a higher liquidity requirement. The argument in favor of such a policy is that, in the presence of the too-big-to-fail problem, large, complex banks are (1) less likely to manage risk properly and (2) more likely to create problems for the financial system if they become undercapitalized. Forcing them to maintain higher capital, greater liquidity, or both would offset some of the social costs associated with their decision to become too big to fail.

These proposed reforms to micro prudential regulation could be extremely helpful, but by themselves they are insufficient. Recent experience has shown that even honest market opinions and bona fide credit
ratings vary in quality over time, and regulatory surcharges for large banks probably would not have deterred the credit boom of 2002–07. During the subprime boom, especially given the agency problems in asset management that accompanied the policy-induced bubble, risk was underestimated in the market across-the-board. Micro prudential rules that rely on signals from the market will not work adequately when distortionary policies promote the systemic underestimation of risk in debt markets. Recognizing that limitation to micro prudential regulation is the primary motivation for adopting additional reforms, including a relatively new idea in financial regulation known as macro prudential policy.

Macro Prudential Regulation Triggers

*Macro prudential regulation* means varying the key parameters of prudential regulation (capital requirements, liquidity requirements, and provisioning policies) according to macroeconomic circumstances. That variation takes two forms: (1) normal cyclical variation in minimum capital requirements as part of countercyclical economic policy and (2) special triggers for increased prudential requirements when asset bubbles seem to be occurring.

The first of these ideas reflects the long-standing recognition that minimum capital requirements that are constant throughout the business cycle are procyclical in their effects: recessions produce bank loan losses, which reduce capital, which forces banks to shrink their lending, which deepens recessions. Repullo and Suárez (2008) simulate bank capital and asset decisions in a model of dynamically optimizing banks under the Basel standards and show that the standards induce substantial procyclicality of credit supply. Adding a simple leverage limit (like the one that already exists as an additional capital requirement in the United States) reduces the procyclicality of credit somewhat, but the best approach is to vary prudential regulation over the business cycle so that capital, reserve, and provisioning standards are loosened a bit at the onset of recessionary shocks. To maintain the adequacy of those requirements during recessions, therefore, one would have to raise minimum capital requirements during boom times, probably substantially above the current minimum capital requirements that apply under either the Basel standards or the U.S. leverage standard.

The second macro prudential idea—increasing capital requirements by more than normal during boom times when the boom also coincides with a high degree of financial vulnerability, as during an asset bubble—has been a topic of debate for the past decade. It reflects the commonly held view that both the pre-2001 Internet bubble and the pre-2007 subprime bubble (and the related phenomena that occurred in parallel outside the United States) could have been avoided if policy makers had leaned against the wind to prevent the bubbles from inflating.

Before embracing that idea, however, advocates of macro prudential regulation must be able to answer three questions: (1) Why should prudential regulation, rather than monetary policy, be the tool used to lean against the wind during bubbles? (2) Is it feasible to identify bubbles in real time...
and to vary prudential requirements to respond to them? (3) What are the potential costs of implementing such an approach?

In answer to the first question, the Fed and other central banks already have their hands full using one tool (the short-term interest rate controlled by the central bank) to hit two targets (low inflation and full employment). Adding a third target to monetary policy (namely, identifying and deflating asset bubbles) would be undesirable because it would complicate and undermine the ability to use interest rates to meet the key goals of monetary policy. This distraction would also make it harder to hold central banks to account for achieving low inflation and high employment: if we try to incorporate secondary objectives into interest rate policy, we may give central banks an excuse for failing to meet their primary objectives.

Furthermore, prudential regulation is ideally suited to addressing asset market bubbles, since loose credit supply has been so closely identified historically with the growth of asset bubbles. Prudential regulations would clearly succeed in reducing the supply of credit by tightening capital, liquidity, and provisioning requirements, and this is the most direct and promising approach to attacking the problem of a building asset price bubble, assuming that one can be identified.

How good are we at identifying bubbles in real time? Is it realistic to think that policy makers can identify a bubble quickly enough and adjust prudential regulations in a timely manner to mitigate the bubble and increase the resilience of the banking system in dealing with the consequences of its bursting? Recent research and experience are encouraging in this respect. Borio and Drehmann (2008) develop a practical approach to identifying ex ante signals of bubbles that policy makers could use to vary prudential regulations in a timely way in reaction to the beginning of a bubble. They find that moments of high credit growth that coincide with either unusually rapid stock market appreciation or unusually rapid house price appreciation are followed by unusually severe recessions. A signaling model that identifies bubbles in this way (that is, as moments in which both credit growth is rapid and one or both key asset price indicators is rising rapidly) would have allowed policy makers to prevent some of the worst boom-and-bust cycles in the recent experience of developed countries. They find that the signal-to-noise ratio of their model is high; adjusting prudential rules in response to a signal indicating the presence of a bubble would miss few bubbles and only rarely signal a bubble in the absence of one.

Recent experience by policy makers has also been encouraging. Spain (the thought leader in the advocacy of macro prudential regulation) displayed success in leaning against the wind recently by establishing provisioning rules that are linked to aggregate credit growth. Colombia was successful in applying a similar approach in 2007 and 2008 (Uribe 2008). Financial system loans in Colombia grew from a 10 percent annual rate as of December 2005 to a 27 percent rate as of December 26. Core growth of the consumer price index rose from 3.5 percent in April 2006 to 4.8 percent in April 2007, real GDP grew 8 percent in 2007, and the current account deficit doubled as
a percentage of GDP from the second half of 2006 to the first half of 2007, rising from 1.8 to 3.6 percent of GDP. That credit boom occurred in spite of attempts by the central bank to use interest rate policy to lean against the wind; interest rates were raised beginning in April 2006 and by mid-2008 had been raised a total of 4 percentage points. In 2008 the central bank and the bank superintendency took a different tack, raising reserve requirements and provisioning requirements on loans and imposing other rules to limit borrowing from abroad. The banking system’s risk-weighted capital ratio rose to 13.9 percent, and credit growth fell to 13 percent in 2008. Colombian authorities are now basking in praise for having reduced credit growth and strengthened their banks’ capital positions in a manner that will substantially mitigate the backlash suffered by Colombian banks from the global financial collapse.

Macro prudential regulation could use a variety of warning signs as triggers for higher regulatory standards. Rather than simply focusing on credit growth, Borio and Drehmann (2008) suggest that a combination of credit growth and asset price appreciation may be optimal. Brunnermeier and his co-authors (2009) argue for the desirability of including measures of systemic leverage and maturity structure.

What economic costs would be associated with adopting macro prudential triggers to combat asset bubbles? Presumably, the main costs would result from false positives (that is, the social costs associated with credit slowdowns and capital raising by banks during periods identified as bubbles that are in fact not bubbles). These costs, however, are likely to be small. If a bank believes that extraordinary growth is based in fundamentals rather than a bubble, then that bank can raise capital in support of continuing loan expansion (in fact, banks have done so during booms in the past). The cost to banks of raising a bit more capital during expansions is relatively small; those costs consist primarily of adverse-selection costs (reflected in fees to investment banks and underpricing of shares), which tend to be small during asset price booms. Indeed, some researchers argue that “hot” markets tend to produce overpriced equity, meaning that banks might enjoy negative costs (positive benefits) of raising capital during such periods.

Most important, macro prudential triggers would promote procyclical equity ratios for banks, which would mitigate the agency and moral hazard problems that encourage banks to increase leverage during booms. Adrian and Shin (2008) show that, during the subprime boom, commercial banks and (even more so) investment banks substantially raised their leverage (which was permitted because regulatory capital standards underestimated their asset risk).

Prior to the establishment of government safety nets and other policies noted earlier, banks behaved differently. Calomiris and Wilson (2004) show that during the boom era of the 1920s, New York City banks expanded their lending dramatically, and their loan-to-asset ratios also rose as the banks actively promoted the growth in economic activity and stock prices.
during the 1920s. But the banks also recognized the rising risk of their assets and made adjustments accordingly. Rising asset risk led the banks to substantially raise their equity capital. New York banks went to the equity market frequently in the 1920s and on average increased their market ratio of equity to assets from 14 percent in 1920 to 28 percent in 1928. Virtually no New York City banks failed during the Great Depression. In a sense, the primary goal of macro prudential regulation is to restore the natural procyclical tendency of bank equity ratios, which has been discouraged by government policies that removed market constraints and incentives and thus deterred banks from budgeting higher capital during booms.

**Prepackaged “Bridge Bank” Plans for Large, Complex Banks**

The too-big-to-fail problem can only be addressed adequately if regulators and bankers alike believe that regulators will be willing and able to intervene and resolve undercapitalized large, complex banks in a timely fashion. The United States established prompt corrective action guidelines in the 1991 FDICIA legislation, which was meant to constrain regulatory discretion about intervention and resolution, avoid regulatory forbearance, and ensure rapid action by regulators. And the United States has established a bridge bank structure that can be applied to speed the resolution of banks that are taken over by regulatory authorities (Herring 2009). Despite these actions, however, none of the large U.S. banks that became undercapitalized during the recent crisis has been resolved through such a structure.

The only way that prompt corrective action can be credibly applied to large, complex banks is if the social costs of intervening in those banks are considered sufficiently low at the time intervention is called for; otherwise, political and economic considerations will prevent intervention. To that end, commercial banks should be required to maintain updated and detailed plans for their own resolution, with specific predefined loss-sharing formulas that can be applied across subsidiaries within an institution operating across national borders. Those loss-sharing formulas must be preapproved by the regulators in the countries where those subsidiaries operate. The existence of such a prepackaged plan would make intervention and resolution credible.

Requiring detailed and credible prepackaged, preapproved resolution plans would have ex ante and ex post benefits for the financial system. Ex ante, it would make large, complex banks more careful in managing their affairs and internalize the costs of the complexity within those organizations. In other words, because complexity and its risks are hard to manage, planning the resolution of large, complex institutions is harder and more costly. If the institutions are forced to plan their resolutions credibly in advance, and if it is very costly for them to do so, then they may appropriately decide to be less complex and smaller. Ex post, changes in the control over distressed banks would occur with minimal disruption to other financial firms, and because financial problems could be resolved more quickly,
managerial incompetence would be corrected more speedily, and “resurrection risk taking” would be avoided.

**Reforming Housing Finance**

The United States has made access to affordable housing a centerpiece of government policy for generations. The philosophy behind this idea is that homeowners have a stake in their community and in their society and thus make better citizens. The argument may have merit, and the costs of promoting access to housing (especially the cost from crowding out of non-housing investments) may be warranted. But highly leveraged homeowners (for example, those borrowing 97 percent of the value of their home using an FHA guarantee) have little stake in their home; indeed, it might be more accurate to refer to them as homeowners in name, but renters in reality.

The key error in U.S. housing policy has been the use of leverage subsidies as the means used by which the government encourages homeownership. Prospective homeowners are helped by the government only if they (or their lending institution) are looking for cheap credit, and the size of the subsidy they receive is proportional to their willingness to borrow. FHA guarantees, Federal Home Loan advances, and government guarantees of GSE debts all operate via leverage.

These subsidies are delivered in an inefficient and distorting manner. Subsidizing the GSEs has been inefficient, since much of the government subsidy has accrued to GSE stockholders; only a portion has been passed on to homeowners in the form of lower interest rates on mortgages. Leverage subsidies also distort bank and borrower decisions by encouraging them to expose themselves and the financial system to too much risk related to movements in interest rates and changes in housing prices. It is remarkable to think that the U.S. financial system was brought to its knees by small declines in average U.S. housing prices, which would have had little effect if housing leverage had been maintained at reasonable levels.3

The GSEs, which are now in conservatorship, should be wound down as soon as possible, and the FHA and Federal Home Loan banks should be phased out. In their place, the United States could establish an affordable housing program that assists first-time homeowners with their down payment (for example, offering people with low income a lump-sum subsidy to apply toward their down payment).

**Improving Bank Stockholder Discipline**

Sweeping changes should be made to the regulation of bank stockholders. As described above, current regulations almost guarantee that large banks will be owned by a fragmented group of shareholders who cannot rein in managers, thus encouraging managers to use the banks to feather their own

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3 The most popular measure of house prices, the Case-Shiller index, substantially overstates the decline in house prices due to regional bias and selectivity bias in the measurement of price change, as discussed in Calomiris (2008b). Average house prices in the United States, properly measured, declined from their peak by less than 10 percent as of the end of 2008.
nests. That agency problem not only produces significant ongoing waste within banks, but also makes the allocation of capital in the economy inefficient. Banks are supposed to act as the brain of the economy, but they will not do so if their incentives are distorted by managers in pursuit of ends other than maximum value for their shareholders. And, in the presence of circumstances conducive to bubbles, as we have seen recently, incentive problems can translate into systemic crises with deep costs, including interruptions in the normal flow of credit, widespread job losses, and destruction of wealth throughout the economy.

A first-best solution would be outright repeal, or at least a significant relaxation, of the Bank Holding Company Act restrictions on ownership of banks, along with removal of other restrictions that make it hard for stockholders to discipline managers (ceilings on institutional investors’ holdings and the Williams Act). These reforms seem unlikely to be enacted at the present time. In the presence of continuing distortions related to corporate governance, bank stockholders, who should be the first line of defense against unwise risk taking by bank management, are unable to exert much of a role. That implies even more of a burden on regulators to implement reforms in micro and macro prudential regulation as well as resolution policies that limit the social costs associated with banking crises.

Transparency in Derivatives Transactions

The growth of over-the-counter (OTC) transactions in recent years has raised new challenges for prudential regulation. OTC transactions are not always cleared through a clearinghouse. Counterparty risk in transactions that do not involve a clearinghouse is borne bilaterally by contracting parties, and the true counterparty risk can be hard to measure, because the aggregate amount of transactions and the net amount of transaction exposure of any one counterparty are not known to the other counterparties. This problem is magnified by the “daisy chain” effect. If A is a counterparty of B, and C is a counterparty of B, then the counterparty risk that A bears in its dealings with B is partly the result of the counterparty risk that B bears in its dealings with C, which is unobservable to A.

The lack of transparency about counterparty risk not only creates risk management problems for banks but also complicates the regulatory process. Regulators are not able to monitor or control individual institution risk (via micro prudential rules) or aggregate risk (via macro prudential rules) if they cannot observe risk accurately. Furthermore, since the counterparty risks in OTC transactions are especially great for large, complex banks, the opacity of those risks aggravates the too-big-to-fail problem. Large, complex banks may even have incentives to undertake more hard-to-observe risk precisely because its complexity and opacity help to insulate them from intervention.

How should prudential regulatory policy respond to this problem? Regulators need to address two separate issues: encouraging clearing and
encouraging disclosure. Policy reforms related to clearing mainly address the
problem of counterparty risk opacity. Policy reforms related to disclosure
mainly address the problem of monitoring and controlling the net risk posi-
tions of individual banks and the systemic consequences of those positions.

With respect to clearing, one option for dealing with systemic conse-
quences of opacity in counterparty risk would be to require all derivatives
contracts to be cleared through a clearinghouse. This is not the same as
requiring all transactions to be traded on an exchange. Some OTC deriva-
tives are cleared in clearinghouses even though they are not traded on the
exchanges affiliated with those clearinghouses. When clearing through the
clearinghouse, counterparty risk is no longer bilateral; rather it is transferred
to the clearinghouse, which effectively stands in the middle of all transac-
tions as a counterparty and thereby eliminates the problem of measuring
counterparty risk or having to worry about “daisy chain” effects relating
to it. Of course, relying on clearinghouses to centralize counterparty risk
requires faith in the efficacy of the self-regulatory rules that ensure the sta-
bility of the clearinghouse (for example, margin requirements), but the self-
regulatory record has been exceptionally good to date.

The problem with requiring all OTC transactions to clear through a
clearinghouse is that this may not be practical for the most customized
OTC contracts. A better approach would be to attach a regulatory cost to
OTC contracts that do not clear through the clearinghouse (in the form of
a higher capital or liquidity requirement). This would serve to encourage,
but not require, clearing through a clearinghouse. For contracts where the
social benefits of customization are high, fees will compensate banks for the
higher regulatory costs of bilateral clearing.

With respect to disclosure, one option would be to require all deriva-
tives positions to be publicly disclosed in a timely manner. Such a policy,
however, has undesirable consequences. Bankers who trade in derivatives
believe that disclosing their derivatives positions could place them at a stra-
tegic disadvantage with respect to others in the market and might even
reduce aggregate market liquidity. For example, if Bank A had to announce
that it had just undertaken a large long position in the dollar-yen contract,
other participants might expect that it would be laying off that risk in the
future, which could lead to a decline in the supply of long positions in
the market and a marked change in the price that would clear the market.
A better approach to enhancing disclosure, therefore, would be to require
timely disclosure of positions only to the regulator and to require public
disclosures of net positions with a lag.

Conclusions

This essay has reviewed the major government policy distortions that gave
rise to the subprime turmoil and suggested robust policy reforms to deal
with them (that is, reforms that take into account the existence of those
The proposed reforms would reduce the costs of distortions related to agency problems, too-big-to-fail problems, and government manipulation of housing credit markets.

Proposed reforms fall into six areas: (1) micro prudential regulation, (2) macro prudential regulation, (3) the creation of credible plans for resolving large, complex banks, (4) the reform of housing policy to eliminate leverage subsidies as the means of promoting homeownership, (5) the removal of barriers to stockholder discipline of bank management, and (6) policies that promote improvements in counterparty risk management and transparency in OTC positions.

The following summarizes the 12 policy reforms proposed in this essay:

1. The use of loan interest rates in measuring the risk weights applied to loans for purposes of setting minimum capital requirements on those loans
2. The establishment of a minimum uninsured debt requirement in addition to other capital requirements for large banks; the specific form of this requirement requires further discussion (candidates include a specially designed class of subordinated debt, CDS issues, or contingent capital certificates)
3. The reform of the use of credit-rating agencies’ opinions either to eliminate their use or to require that NRSROs offer numerical predictions of PD and LGD, rather than letter grade ratings, and be held accountable for the accuracy of those ratings
4. A regulatory surcharge (which takes the form of higher required capital, higher required liquidity, or more aggressive provisioning) on large, complex banks
5. Macro prudential regulation that raises capital requirements during normal times in order to lower them during recessions
6. Additional macro prudential regulatory triggers that increase regulatory requirements for capital, liquidity, or provisioning as a function of credit growth, asset price growth, and possibly other macroeconomic risk measures
7. Detailed and regularly updated plans for the intervention and resolution of all large, complex banks, prepared by these banks, that specify how control of the bank’s operations would be transferred to a prepackaged bridge bank if the bank became severely undercapitalized; these plans would also specify formulas for sharing losses among international subsidiaries of the institution, and the algorithm specifying those loss-sharing arrangements would be preapproved by the relevant regulators in countries where the subsidiaries are located
8. The winding down of Fannie Mae and Freddie Mac, the phasing out of the FHA and Federal Home Loan banks, and the replacement of those leverage subsidies with down payment assistance to low-income, first-time home buyers
9. The elimination of bank holding company restrictions on the accumulation of controlling interests in banks
10. The relaxation of Williams Act requirements that buyers of more than a 5 percent interest in a company must announce that they are acquiring a significant interest in a company and the elimination of regulatory limits on the percentage interest that institutional investors can own in public companies.

11. The enactment of regulatory surcharges (via capital, liquidity, or provisioning requirements) that encourage the clearing of OTC transactions through clearinghouses.

12. Requirements for timely disclosure of OTC positions to regulators and lagged public disclosure of net positions.

References


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