

The 2007 Meltdown in Structured Securitization: Searching for Lessons not Scapegoats*

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Abstract: The intensity of recent turbulence in financial markets has surprised nearly everyone. This paper searches out the root causes of the crisis, distinguishing them from scapegoating explanations that have been used in policy circles to divert attention from the underlying breakdown of incentives. Incentive conflicts explain how securitization went wrong, why credit ratings proved so inaccurate, and why it is superficial to blame the crisis on mark-to-market accounting, an unexpected loss of liquidity or trends in globalization and deregulation in financial markets. Our analysis finds disturbing implications of the crisis for Basel II and its implementation. We argue that the principal source of financial instability lies in contradictory political and bureaucratic incentives that undermine the effectiveness of financial regulation and supervision in every country in the world. We conclude the paper by identifying reforms that would improve incentives by increasing transparency and accountability in government and industry alike.

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I. Introduction

Since August 2007, after a long period of relative quiet in world markets,¹ a spreading financial crisis has nearly monopolized the flow of economic news. Occurring during a period of strong world macroeconomic growth and low interest rates, the crisis appears to have surprised financiers and regulators alike. The turbulence was triggered by a sudden and widespread loss of confidence in securitization and financial engineering and by the manifest failure of respected statistical models for assessing and pricing credit risk.

Most astonishingly, these now-doubtful techniques had previously been hailed as the cornerstones of modern risk management. Moreover, the turbulence proved greatest in countries whose supervision of credit risk had been thought to be the best in the world. Indeed, the regulatory standards and protocols of these countries were in the process of being emulated worldwide.

As the crisis unfolded, the world witnessed: an unprecedented rate of default on AAA instruments, the first run on a U.K. bank in 150 years, and an explicit extension of the U.S. safety net to cover major investment banks and two giant government-sponsored housing-finance enterprises (Fannie Mae and Freddie Mac).

Reverberations quickly spread beyond the two financial-center countries to other industrial countries including Australia, Ireland and Germany. Institutions have already written off losses in excess of \$500 billion and close observers expect the ultimate total to range between \$1 trillion and \$2 trillion. Inquiring minds yearn to know how this crisis

¹ From 1998 to 2007, the only significant financial crisis occurred in Argentina, a country that has experienced numerous crises throughout its history, and whose crisis had major consequences for a single neighboring country (Uruguay).

could have occurred in the 21st Century, and especially how it could have originated in the United States, home to arguably the most sophisticated financial system in the world.

Promptly uncovering the true roots of this crisis is important because false explanations are quick to gain a toehold. As a crisis matures and then begins to recede, policymakers and pundits often latch onto simplistic theories of what happened, why it happened, and what should be done to see that similar events do not happen again. Sadly, the story that official theories are beginning to tell and the policy solutions that these flawed theories recommend tend to be dictated not by the economics of crisis generation, but by self-interested jockeying by groups and individuals that are anxious either to shift blame away from themselves or to see that national safety nets remain an important source of subsidies to large and complex institutions.

Our study seeks to make it clear that the principal source of financial instability is not to be found in the aberrant behavior of a few greedy individuals or in a sudden weakening of important institutions of a particular country at a particular time. Systemic financial fragility traces instead to a web of contradictory political and bureaucratic incentives that undermines the effectiveness of financial regulation and supervision in every country in the world. Weaknesses in supervisory incentives encourage modern safety-net managers not only to tempt financial institutions and their customers to overleverage themselves in creative ways, but also to close their own eyes to the unbudgeted costs of the loss exposures that excess leverage passes onto financial safety nets until it is too late for anyone to control the damage that results.

To provide a conceptual foundation for our analysis, the next section establishes that regulation and supervision must be viewed as an endless game of action and

response. This dynamic perspective helps us to ask and answer a series of central questions about the origins of the latest crisis:

- where did modern financial engineering, securitization and risk management go wrong?
- why did rating organizations not uncover the dangers, and who should bear responsibility for over-rating securitized debt?
- can mark-to-market accounting cause a crisis or is it merely a messenger?
- was the meltdown mainly a crisis of liquidity?
- what did financial globalization contribute to the crisis, and should links among national markets be restrained in some way?
- has Basel II failed already, or would its wider implementation have stopped the spread of the current turmoil?
- what light can financial history cast on crisis events?

The paper closes by focusing on alternative reform strategies. It discusses some prominent proposals for reworking regulatory and supervisory incentives and identifies the lessons that developing countries ought to draw from the crisis episode.

II. Regulation as an endless game of back and forth

Financial systems are prone to periodic breakdowns, with at least one significant financial crisis occurring almost every decade of the 20th Century. The current crisis proved shocking only because it followed a period of sustained economic growth and ran counter to a well-established belief that flexible and resilient markets were distributing risk to those who could bear it best and therefore could absorb almost any shock that adverse events may generate. In these circumstances, investors and regulators had

developed a false sense of security. With the financial system deeply distressed again, confidence and trust have evaporated and demands for increased regulation are being sounded far and wide. But before governments around the globe can formulate an adequate plan for regulatory and supervisory reform, they must make sure they understand how and why things went wrong. And to uncover the real causes of the crisis, they must do more than identify a set of convenient scapegoats.

Financial contracts are fragile because they are built on reciprocal trust. In a financial contract, cash is exchanged for the mere promise of payment in the future. Problems arise because of limited (and sometimes hidden) information about the character of each counterparty and about the difficulty of monitoring an obligor's subsequent behavior. Many financial institutions also engage in maturity transformation by funding their assets with demandable and other forms of short-term debt. This makes their ability to keep their promises susceptible to adverse movements in interest rates and customer confidence and to panicky herding by investors.

Despite their inherent fragility, financial institutions underpin economic prosperity. A well-functioning financial system channels funds to the most productive uses and allocates risks to parties who appear able to bear them. This boosts macroeconomic growth, improves individual opportunity, and reduces poverty.² These important functions explain why when financial crises develop they are apt to be costly. Historically, countries that suffer crises experience substantial interruptions in their growth rates. Sometimes growth is set back for a decade or more.

It is not surprising then that governments everywhere seek to regulate financial institutions, both to avoid crises and to make sure a country's financial system efficiently

² See Levine (2005) for a review of the literature.

promotes economic growth and opportunity. Striking a balance between freedom and restraint is difficult. Financial innovation inevitably exacerbates risks, while a tightly regulated financial system hampers growth. When regulation is either too aggressive or too lax, it damages the very institutions it is meant to protect.

As outsiders, in monitoring and enforcing financial discipline, regulators are at a disadvantage. Regulation is best seen as an endless and unfair game of action and response. In this game, the regulated side is able to move more often and more quickly than the regulatory side can. Regulators inevitably find themselves trying to catch up with their regulatees. Every move they make generates a series of new and creative moves by financial institutions who seek to minimize the burdens regulations ultimately place on them (Kane, 1977). Their profit-making orientation ensures that the moves that financial institutions make are not only swifter, but also more complex and harder to anticipate than those of regulators.

Stock-based compensation can align the incentives of employees of regulated institutions in ways that government agencies cannot match. Regulatory decisionmaking is also often influenced adversely by political pressure for regulatory and accounting forbearances. Finally, in responding to regulatee avoidance activity, regulators are reluctant to squelch regulation-induced innovations lest they be portrayed as preventing inventive firms from competing effectively in global markets.

The longer a given regulatory scheme stays in effect, the more efficient regulatory arbitrage becomes. As time passes, regulatees develop more and more complex techniques for extracting subsidies from the safety net, and the safety-net consequences become increasingly less transparent to government supervisors. During the last forty

years financial institutions in the US focused considerable energy on overcoming burdensome restrictions on deposit interest rates, bank locations, and charter powers. Over this same interval, they became increasingly aware of opportunities to shift the deep downside of their risk exposures onto the safety net. When Congress abandoned most of its restrictions on locations, rates, and activities, financial institutions increasingly concentrated on creating instruments and structures with which to exploit loopholes in the regulation and supervision of financial-institution leverage. Financial globalization assisted in this process by enabling corporations and financial institutions to escape burdensome regulations in their home countries by strategically booking their business offshore. Differences in efforts to enforce burdensome rules create arbitrage opportunities that large or complex institutions can use to shift different kinds of complex risk onto private counterparties and safety nets in home or host countries.

Even in the most-sophisticated financial environments, authorities proved slow to acknowledge that large and complex financial institutions were using off-balance sheet securitization vehicles to escape restrictions on their ability to expand leveraged risk-taking. Securitization increased these firms' access to safety-net subsidies not just by increasing their size, complexity or geographic footprint, but also and most importantly by concealing increases in effective leverage. Beginning in August 2007, central banks in the US and Europe kept credit flowing to wily institutions that – as originators of risky loans or as sponsors of securitization conduits – had sold investors structured securitizations whose highest-quality tranches were so lightly subordinated that insiders had to know that the instruments they had designed were significantly over-rated. In the US in particular, an unprecedented expansion of Federal Reserve liquidity facilities and

Federal Home Loan Bank advances helped some of the most blameworthy institutions to avoid asset sales that might otherwise have triggered net-worth writedowns punishing enough to force them out of business.

Exploitive risk-shifting took place at every stage of the financial engineering process. Lenders collected upfront fees for originating and selling poorly underwritten (and sometimes fraudulently documented) loans and passed the risks along to investors and securitizers without accepting responsibility for subsequent defaults. Securitizers sliced and diced the cash flows from questionable loans without demanding appropriate documentation or performing adequate due diligence. Insurers and credit-rating organizations (CROs) used poorly tested statistical models and issued (along with accountants) aggressive judgments about whether a nonrecourse “true sale” of the underlying loans had actually taken place. Finally, servicers accepted responsibility for working out troubled loans without assembling an appropriate information system or training a staff large enough to deal with the delinquencies and defaults they might (and did) eventually face.

On the grounds that these innovations helped US firms to compete more effectively in the global marketplace, the SEC and banking supervisors refused to take on the political and practical challenge of establishing and maintaining their ability to see and to discipline these complicated and outsized risk exposures. When distressingly large losses began to emerge, Federal Reserve and Federal Home Loan Banks started lending to distressed firms against questionable collateral, refusing to acknowledge that these programs were taxpayer “bailouts” and claiming (without supporting evidence) that

subsidy-generating loans and forbearances would prevent insolvency from spreading throughout the financial sector and plunging the economy into a deep recession.

Incentive conflict leads authorities repeatedly to underestimate the importance of crisis planning. The current crisis illustrates that, even in the most-developed countries, when a crisis threatens authorities find it difficult to control risk-taking by large financial institutions for fear of being blamed for aggravating their weakness and find it much easier to subsidize distressed firms by granting them subsidized loans or guarantees and imprudent relief from regulations. As illustrated by the Bear Stearns case, authorities generally prefer to attribute a deeply distressed firm's longstanding difficulty in rolling over its debt to a shortage of market liquidity and are content to make this claim without conscientiously doublechecking the firm's true condition by promptly dispatching a team of forensic examiners to take a close look at its accounts.

Loopholes in supervision clearly sowed the seeds of the current crisis. The importance of regulatory arbitrage in generating crises tells us that static approaches to bank regulation, such as those imbedded in the Basel accords, are bound to fail. Commercial and investment banks quickly adjusted to Basel's initial formulas for measuring capital adequacy and rendered them all but toothless. Banks moved assets with burdensome capital charges into securitization vehicles that took them only nominally off their balance sheets. Supervisory concerns about the potential recklessness of subprime, optional-payment and zero-equity mortgages that aggressive institutions were originating were calmed by asserting that securitization had transferred these risks to parties that could absorb them handily.

To control safety-net subsidies in the future a different kind of re-regulation is needed. The new system must create strong incentives for supervision and regulation to be conducted in a dynamically adaptive manner. Regulatory strategies that ignore the need for incentive reform and dynamic adaptation will merely renew the cycle of subsidy-induced innovation and crisis. Regulators need to be made accountable for delays in identifying contracting innovations that reduce transparency and facilitate risk-shifting. Supervisors must observe and study nontraditional loss exposures, and be prepared to discipline them appropriately as soon as they emerge. Adaptive oversight cannot be performed without tying it to market signals, such as those emanating from the market for credit default swaps.

Though by no means blameless, the failure of private parties to undertake sufficient due diligence is rooted in the failure of government supervisors to challenge rating decisions made by accountants and credit-rating organizations that had safety-net implications. Hence, while the recent crisis exemplifies the limits of market discipline, the market's failures are layered on a series of failures in supervision.

While the key reform is to remedy gaps in information, the solution is not just to insist that financial firms disclose more information about what they are doing. What we need is for firms and regulators to disclose enough information about the value and measurement of potential claims on the safety net to establish political accountability for controlling these subsidies. Important institutions and their supervisors must be required to model and estimate the value of this intangible source of income--both at individual institutions and in the aggregate. They must also to expose these models and estimates to outside review.

The breakdown of the securitization process underscores the importance both of basing capital regulation on accurate and timely information and of seeing that supervisors monitor and respond to market signals promptly. Managers of financial institutions knew that reducing the transparency of their claims on the safety net by embedding outsized risk exposures in complicated off-balance-sheet instruments would benefit their shareholders. But they could collect and dividend out profits earned from regulatory arbitrage only as long as they could hide their increased leverage and resulting reputational risks from supervisors and creditors. In tolerating an ongoing decline in transparency, supervisors encouraged the very mispricing of risk whose long-overdue correction triggered the crisis. The correction punished three groups: investors who accepted more risk than they wanted, borrowers who overleveraged themselves, and taxpayers who will ultimately be roped into cleaning up the mess.

It is important to understand that the goal of financial regulation and supervision is not to reduce financial institution risk-taking, but to manage the safety net so that private risk-taking is neither taxed nor subsidized. This goal implies that supervisors have a duty to see that risks can be fully understood and fairly priced by investors. No one should expect that, in a risky world, risk-neutral regulation and supervision can eliminate the risk of financial crises. What it can do is to reduce their frequency and cost. For this to happen, not only must safety-net subsidies be measured regularly, regulators must also acknowledge their need to work out and publicize an operational benchmark plan for resolving whatever crises might occur. To maximize the value of the safety net to society as a whole, the benchmark plan should spell out market-mimicking methods for recapitalizing large and complex firms anytime they threaten to become insolvent.

The plan should include provisions that promise to compensate taxpayers properly for the costs of any assistance a troubled institution might need.

III. How did securitization go wrong?

The first reaction to the breakdown of structured securitization was disbelief: How could something as universally applauded as financial engineering go so wrong? Securitization was supposed to identify risks accurately and parcel them out to parties who could easily bear the risks they assumed. But everyone now realizes that promoters of modern techniques of risk management promised a great deal more than they could ultimately deliver.

For centuries, loans were the most illiquid parts of a bank's balance sheet. Loan sales were limited by fears rooted in asymmetric information and adverse selection. Unless the sales contract specifically protected the buyer against the sellers' informational advantage, the original lender would be tempted to sell off its worst loans (its so-called lemons) and hold back its solid loans for itself. These same issues made it hard for a buyer to resell loans when funds were needed.

Securitization provided an indirect way to sell loans, one that could offer buyers a number of useful safeguards and also made it easy for a buyer to reverse its position later. By retaining a first-loss position in the asset pool and overcollateralizing the securities issued, lenders could ameliorate investor concerns about the quality of the loans chosen to back their claims.

In the United States, securitization began in the 1970s. Its rapid development was greatly assisted by guarantees provided to investors by the Federal National Mortgage

Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac). These government-sponsored enterprises (GSEs) regularized market practices by standing ready to buy and securitize mortgages that conformed to the particular standards that they set (Gorton and Pennachi, 1995). Subsequently, private securitizers developed protocols for trading claims to cash flows from other types of standardizable loans. The largest markets cover mortgages that were too big for the GSEs to purchase (“jumbos”), credit-card debt, student loans, and automobile loans.

By turning the cashflows from a pool of illiquid underlying assets (such as mortgages) into tradable bonds, securitization created liquidity and that liquidity promised to make the financial system better diversified and more resilient. Instead of bankers having to hold onto and support every loan they originate until it matures or defaults, securitization allowed risks to be stripped from the loans and disbursed beyond the traditional geographical areas in which a particular lender had been operating to investors in any country of the world. Plain-vanilla passthrough securities did this in a very straightforward fashion, bringing down the cost of mortgages and making home ownership more affordable for a range of marginally less-creditworthy individuals.

Securitization would not greatly degrade credit quality, as long as quality is transparent and well-priced to all parties along the securitization chain. Breakdowns in assessing and pricing mortgage risk played an important role in the seizing up of asset-backed markets in 2007. While passthrough securitization is simple enough, over time a concerted effort to squeeze tranches of highly rated claims out of pools of low-quality assets led securitizers to fashion very complicated structures of cash-flow disbursement. The relation of particular tranches to the underlying asset pool was often very opaque.

This made tranching claims difficult to value and susceptible to sudden changes in risk perception.³ Large banks could sell almost any pool of loans, securities, or revenues into the securitization process. Buyers would slice the claims they used into a series of at least three subordinated tranches: senior (AAA), mezzanine (BBB), and an unrated residual or “Z” tranche of equity support. In the event of defaults on individual loans, the Z tranche would absorb losses until the equity was used up. After that, the BBB tranche would absorb further losses until it too was exhausted. Subordinated tranching of risk does not mean that the loans in the securitized pool were divided into bands based on the credit risk of particular loans. Rather, senior tranches had the first claim on whatever cashflow the whole asset pool might generate. Buying a senior tranche offered protection against losses by assigning them probabilistically to the junior tranches. Investment-grade credit ratings CROs awarded to the senior tranches suggested they were safe even when the underlying collateral was all subprime.⁴

Often originators sold their loans to a “Structured Investment Vehicle” (SIV) that they may have sponsored themselves. A third party, such as an investment bank, could then purchase debt or securities issued by the SIV and slice (i.e., “tranche”) cashflows on them into a Collateralized Debt Obligation (CDO) that created waterfalls of further layered and structured claims against the SIV’s underlying pool of assets. As complex instruments multiplied from CDOs to CDOs of CDOs (i.e., CDO-squareds), it became harder and harder for anyone other than the issuer and its credit rating organization to understand what the composition and quality of underlying assets had to do with their value.

³ See Mason and Rosner (2007) for a description.

⁴ Recently one investment bank sold some of its super-senior holdings for only 22 cents on the dollar, and at least one critic claimed that their true value was closer to zero (Roubini, 2008).

The root problem with securitization -- as with loan sales -- is that outsourcing the funding side of an originator's balance sheet undermines its incentives to monitor the quality of the loans it originates. Troubled loans become the property and problems of someone further down the transaction chain. As the demand for highly rated tranches intensified and securitization became more complicated and less transparent, underwriting incentives weakened because securitizers and credit rating organizations did little actual due diligence. Low interest rates and increasing housing prices encouraged an overly friendly regulatory environment both for highly leveraged mortgages and for securitization structures based on them.

Because securitization caused more subprime mortgages to be written, it expanded access to home ownership substantially.⁵ However, higher volumes went hand-in-hand with lower standards and severe mispricing of risk. Dell'Ariccia, Igan and Laeven (2008) show that standards weakened the most for borrowers whose risks were highest. Increases in the volume of loan applications by subprime borrowers were associated with an increased rate of approval and lower loan quality.⁶ In contrast, for borrowers classified as prime, increased applications produced more rejections. Following a bundle of 3949 subprime loans originated by the now-bankrupt firm New Century Financial, Ashcraft and Schuermann (2008) demonstrate that the borrowers were exceptionally risky, leaving one to wonder why these loans were originated in the first place.

How can one explain the growth of securitization? On the demand side, much of the answer is that the SEC and bank regulators set rules that fed an outsized demand by

⁵ The value of subprime mortgages originated in the US shot up from \$190 billion in 2001 to \$600 billion in 2006. Much of this growth was fueled by securitization: as a percentage of subprime mortgage originations, the volume of subprime issuance rose from 50% to 80% over the same interval (Economist, May, 2008).

⁶ Also see Keys et al. (2008) for consistent results.

trusteed investors for investment grade and other highly rated debt. On the supply side, risk-shifting created arbitrage profits for institutions able to service this demand.

Securitization was simply the latest innovation through which financial institutions could simultaneously collect fees from investors and arbitrage loopholes in bank regulation and supervision. By placing important tranches of risky loans through and with foreign and nonbank firms, large commercial and investment banks layered the institutional character and broadened the geographic span of their funding arrangements. Moreover, they did this in ways that made these institutions ever more complicated, ever more interlinked and therefore ever more difficult to fail and unwind in the event of a crisis. All of this increased their conjectural claims to intangible safety-net subsidies. Investors in complex claims on securitized pools of loans tended not to rely on either the lender's or their own due diligence and until well into 2007 many investors deemed it reasonable to allow credit rating organizations to assess the risks for them.⁷ With supervisors closing their eyes to the fraying of contractual incentives for lenders and credit raters to fulfill their duties, few investors saw any reason to doubt that they were purchasing well-rated and well-priced securities. Investors' mistaken belief that their growing demand for highly-rated investments was being properly serviced allowed the demand side of the market to expand steadily.

Outsized commissions and fees earned on securitizations assured a steadily growing deal supply. Compensation systems in commercial and investment banking paid large bonuses tied to immediate profits, and required no payback if losses occurred in subsequent years. Even when compensation took the form of stock options, blackout

⁷ We look at mistakes in rating such instruments in the next section.

periods before such options could be exercised were too short to align employee incentives with the long-term interest of the firm.

The 1988 Basel Accord (Basel I) also helped to generate a supply of loans to be resecured. The accord tied two layers of bank capital requirements to an arbitrarily risk-weighted sum of their assets. The arbitrariness of the weights gave banks an incentive to move assets into off-balance-sheet securitization vehicles because capital charges on credit lines with which sponsors supported these vehicles were lower than the charges levied against on-balance-sheet positions.

IV. Why were credit ratings so inaccurate?

While risk-management mistakes, low interest rates and some kind of asset-price bubbles are features of most crises, this crisis may be remembered as one in which long-successful systems for using debt ratings to control institutional risk-taking failed massively.

Although blame must be apportioned across the entire chain of securitization activity, U.S. credit rating organizations (CROs) come in for special criticism because investors have seen an embarrassingly large number of downgrades and defaults for highly rated securities. In helping potential counterparties to assess the creditworthiness of individual bond issues, CROs earn profits by producing classificatory information that regulators find helpful and that investors and guarantors use to compare credit spreads on issues of risky debt. However, CRO revenues come not from the investor or regulatory side, but from fees that issuers pay CROs for analyzing the credit quality of different issues; although accurate ratings benefit investors and issuers alike, issuers are asked to pay the freight because, once it is announced, a security's credit rating becomes public

knowledge. This asymmetric arrangement poses an obvious conflict of interest for CRO managers. Borrowers have an incentive to play different CROs against one another and to hold out for higher-than-appropriate ratings. For issuers and securitizers, the counterincentive to seeking a corrupt rating is that they also need to employ a CRO that has a well-established reputation for honest and accurate work.

Until the 1970s, ratings were generally in low demand (Sylla, 2001). CROs' value added was uncertain and as recently as the 1960s these firms employed only a half-dozen analysts, with their then-meager revenues coming mostly from sales of research (Partnoy, 2001). Ratings were long criticized as lagging the business cycle – issuing upgrades late in cyclical upswings and downgrades during slowdowns in ways that did not help investors to anticipate or protect themselves against a rise in defaults. This is amply demonstrated by the avalanche of ratings downgrades in the 1930s.⁸ However, in 1975 the Securities and Exchange Commission created the designation of a “Nationally Recognized Statistical Ratings Organization (NRSRO),” and over time ratings-based government rules restricted the decisions of a variety of actors (pension funds, insurance companies, banks, municipalities, etc.). Government reliance on ratings encouraged private organizations to incorporate ratings into their own governance procedures or to advertise that only investments above a certain rating would be held. With financial intermediaries either strictly required to hold only highly rated instruments or allowed to hold less capital against highly rated securities, ratings understandably grew in demand,

⁸ Prior to World War I, corporate default rates were significant and ratings agencies did seem to supply some modest function, though even the most authoritative study (Hickman, cited in Sylla, 2001) fail to lay to rest the critique that ratings might at most have been modestly anticipating declines in performance and did not do demonstrably better than market indicators. In the post-WWII period through the early 1970s, the default rate on corporate bonds declined to only about 1%, so ratings were not critical to investors' decisions.

as did the pressure for “rating inflation.” By the late 1990s when the structured finance business expanded sharply, the CRO industry expanded apace. By 2006, Moody’s, which won a large share of this business, was generating over \$6 million per employee and employed over 20,000 persons worldwide.

Because many regulatory agencies, investors and bond insurers rely on CRO credit ratings to substitute for their own due diligence, the contract interest rate an issuer has to pay falls whenever its credit rating rises. In turn, for established CROs, the time and effort required to build a reputation for reliability and the bureaucratic difficulties to be surmounted in being named an NRSRO create a dual barrier for would-be new entrants into the CRO industry. Reinforced by established firms’ tendency to acquire lesser players, these barriers give them a leg up in foreign venues as well. The resulting oligopolistic market structure helps to explain why major ratings organizations do not compete either in the models they use to assess credit risks or in the criteria they use to map the forecasts their models produce into different rating classes. This similarity in methods means that errors are likely to be similar, too. The core problem in the securitization crisis is to understand how and why securitizers, CROs, and bond insurers drastically over-rated and over-sized the highest-quality tranches of structured-finance obligations.

Part of the explanation lies in the incentive conflict managers and line employees of such firms faced between preserving the long-run value of their firm’s reputation and chasing bonuses and raises that short-run revenue expansion can generate. Errors in classification are slow to reveal themselves. They can only be established after a long and variable lag. This lag means that, to keep a firm’s reputation strong over the long

run, compensation structures must include features that promise to reward employees for taking the long view and penalize them for succumbing to short-termism. Given the high proportion of revenues earned in recent years at the top three ratings firms (Moody's, Standard & Poors, and Fitch) from rating securitizations, individual managers and analysts must have been sorely tempted to risk the firm's reputation to secure or retain the repeat business of the biggest issuers and it is doubtful that salary structures fully neutralized this temptation. According to Portes (2008), 44 percent of Moody's 2006 revenue came from advising issuers first on how to collateralize and to assign (i.e., to slice or "tranche") cash flows from pools of securitizable assets to get a desirable package of ratings and then going on to rate the credit risk of the various packages that it and other CROs helped to construct.

What's different about rating structured instruments?

In principle, each rating should be interpreted as an interval estimate: i.e., as the sum of a point estimate and a two-sided margin for error. When a CRO does a good job of rating bonds or multipart securitization structures, observed value of default and loss rates in different rating classes correlate closely with the riskiness of the grade that securities in each category had previously received. Because securitized instruments are claims on a static portfolio, servicers who manage the cashflows can do little to mitigate the potential nonlinear impact of adverse events on investor returns. Even if point estimates of loss exposure were the same for a bond and a securitized claim, their margins for error would be very different. This means that it was misleading for CROs to employ the same set of letter grades to rank the through-the-cycle loss exposures of the tranches of structured deals and ordinary bonds.

Even on ordinary bonds, ratings are lagging indicators whose changes tend to come too late to help investors avoid losses when an issuer's credit standing weakens or to achieve gains when an issuer's prospects improve. This leads scholars to question whether on most deals CROs add enough informational value to justify their existence (Sylla, 2001). However, because of the growing complexity of structured instruments, there can be no doubt that ratings were central to the successful placement of synthetic securities. The SEC and other regulators effectively ceded to CROs their public-interest responsibility for monitoring and disclosing investor loss exposures in structured financial instruments. Trustee investors flocked to the highly rated tranches of structured securitizations precisely because they promised miraculously to combine AAA and AA ratings with extraordinarily high yields and regulators did not challenge this promise. As noted earlier, these high yields came mostly from blending in returns from the lower-rated components of CDOs.

Although actual and proposed reforms seek to rework the details of CRO and issuer interactions, the process of rating complex structures of securitized debt differs critically from that of rating a simple bond issue. The process of rating a structured product is a sequence of bilateral negotiations that starts with the issuer specifying the mix of credit ratings it is looking for. CROs compete by specifying the subordination structure and level of credit support needed to obtain the ratings desired. That a give and take between CROs and securitizers did occur is suggested by the high concentration of CRO forecasts for structured deals that lie at "notches" just above the thresholds that would move the different tranches into the next lower ratings class (Mason and Rosner,

2007). This implies that the associated interval estimates on most issues regularly dipped at least into the next-lowest rating class.

Regulatory concern about ratings shopping is reflected in the June, 2008 agreement to separate the pricing of CRO structuring and credit-rating services negotiated by the New York Attorney General and in the SEC's proposed ban on allowing individual CROs to rate any deal that they have tranced and collateralized. It is important to recognize that, whether or not separating the rating and structuring functions in the same firm might have a beneficial effect, assessing the risk of a portfolio of infrequently traded and innovative instruments and monitoring factors that change this riskiness over time pose difficult problems of data verification and analysis. CROs could and should have identified and addressed these problems more carefully. Using a prudent-man standard, a conscientious applied econometrician would have felt duty bound to discount the margins for error assigned to complex mortgage securitizations for the modeling, sampling, legal, and documentation risks that investors were asked to assume. If the industry had been less oligopolistic, competitive pressure likely would have led independent parties to be tasked with auditing the models and criteria on which individual CRO ratings were based and to fact-check the data used to estimate model parameters. Most importantly, conscientious outside reviewers would have insisted that CROs update their models and rating methods as soon as evidence began to develop that loan pools in the 2005 and 2006 vintages were declining sharply in credit quality. For

without the protection of ratings-based legal “safe harbors,” fund managers would have had their decisions exposed to adjudication in court.⁹

The models CROs used were known to incorporate unverifiable and overly convenient assumptions about correlations, tail risk, and marketability that were bound to break down (i.e., to lose applicability) in periods of stress. Many deal structures were so new and untested that real-world data on default frequency and loss given default had to be drawn entirely from an unrepresentative period of soaring house prices and needed to be supplemented by synthetic data that could incorporate reasonable estimates of effects that might unfold in times of price decline and market stress.

CROs need to take responsibility for their mistakes...

Formally, a CRO’s aggressive declaration that an adequately documented “true sale” of a particular loan pool had taken place was a key step in moving the assets off originator and securitizer accounting balance sheets. But CROs apparently felt no duty to describe how fully the ownership of the pool could be documented and CRO judgments on this matter could have had no legal standing in any case.

The quality of CRO analysis was and is further undermined by CRO efforts to avoid legal responsibility for any mistakes. Despite their intense and critical involvement in designing securitization structures, CROs claim only to be expressing an “opinion.” They insist that the constitutional right of free speech protects them from lawsuits for damages suffered by investors who chose to rely on what might turn out to be incompetent or negligent opinions. To create a foundation for this defense, CROs routinely incorporate language into their reports stating that it is “unreasonable” for

⁹ It is interesting to speculate on how many fund managers would have successfully defended their position with the claim that they did not know what they were investing in (but neither did their competitors) or that they knowingly invested in pools of high-risk mortgages confident that housing prices would rise endlessly.

anyone to rely on their “mere opinions,” which should not be construed by anyone as “investment advice.” Ironically, for investors and regulators, the reputational damage CROs have absorbed from massively over-rating structured securitizations has imparted to these weaselly disclaimers an element of unintended truth that has undermined the value of their brands and is forcing them to rebuild confidence in the value of their work. They will find that this can only be done by taking ex post responsibility for future mistakes.

Because CRO fees were so large and because synthetic securities could not legally have been sold in large quantities to trustee and municipal investors without the blessing of high ratings, the courts might impose this result on CROs in any case. Whenever someone (say, a lawyer) collects a large fee for communicating his or her opinion to another party, the distinction between opinion and advice seems to break down. The sheer size of the fees collected for forming and issuing opinions about the riskiness of complex securitizations renders hollow the claim that users should not -- and therefore would not -- rely on them. In fact, CROs had to foresee and value that reliance. They should share responsibility with any securitizer and insurer of these deals who distorted or failed to verify the value of the analysis on which CRO “opinions” ultimately were based.

...but the authorities also played a role

On the grounds that they were helping innovative US firms to compete effectively in global markets, federal supervisors refused to take on the political and practical challenge of establishing and maintaining their ability to see and discipline complicated risk exposures. By tolerating the decline in transparency that came with structured

finance; by not recognizing CRO incentives and that they are using poorly tested models and issuing aggressive legal judgments about whether nonrecourse “true sales” of the underlying loans had actually taken place; and by not requiring CROs to discount their ratings on these instruments for the modeling and documentation risks inherent in structured finance, supervisors made it difficult for themselves and other market participants to recognize and discipline these risks. As a result investors were fed overly optimistic estimates of the credit quality of the instruments they purchased.

Going forward, the problem is to find reliable ways to express and value differences in risk on structured instruments. One way is for CROs to bond the quality of their work by subjecting it to effective independent review (Goodhart, 2008a) and setting aside some of their fees in a fund from which third-party special masters or expedited civil judgments could indemnify investors for provable harm in instances where the independent reviewers find that negligence or misfeasance occurred. If and only if the analysis used to estimate credit quality can be adequately bonded, can bid-asked spreads on securitized instruments fall back toward those quoted on conventional debt.

V. Did mark-to-market accounting contribute to the crisis?

In the US, accounting rules consist largely of generally accepted accounting principles (GAAP) and generally accepted auditing standards (GAAS). GAAP sets rules that constrain (but do not fully determine) the information systems that financial-institution managers may use to document their firm’s economic condition and performance. GAAS sets procedures to be used in examining and verifying a firm’s reports and records for compliance with GAAP.

In a world of diverse and evolving circumstances, reporting systems inevitably convey options about where to book and how to measure risk exposures and changes in value.

The existence of these options and the ways that particular institutions use them to conceal losses is only imperfectly understood by outsiders. From a statistical point of view, accounting income and net worth are merely estimates of a firm's economic income and ownership capital. Because contemporary reporting systems only provide imprecise point estimates of the current and future earning power of a firm, careful users of accounting data must acknowledge the existence of a margin for error. In different firms and in the same firm at different times, measures of income or net worth may be biased up or down and may vary substantially in their exposure to estimation error. GAAP has never required a firm to report interval estimates or to disclose helpful supplementary information about the degree of imprecision or bias inherent in the methods its managers adopt.

Observers who fail to acknowledge the many reporting options that fair-value accounting still allows blame it for causing the crisis. They argue that thin markets can cause a downward spiral in asset prices by encouraging institutions to sell troubled assets quickly and "forcing" them to take writedowns that understate the "true" value of the underlying assets. However, in creating and deepening the securitization crisis, the most serious impact of accounting rules did not emanate from the values chosen to represent various on-balance-sheet positions. It came instead from using off-balance-sheet extensions of commercial and investment banks to warehouse risks that, for reputational

reasons, would have to be brought back onto the balance sheet if and when cumulative losses developed.

Especially at large and complex financial institutions, individual managers have strong incentives to discover and to exercise reporting options that overstate their capital and understate their exposure to loss. This expands their ability to extract implicit subsidies that risk-taking can generate from implicit safety-net support.

Concealment processes may be characterized as simple and complex forms of arbitraging the supervisory system. Whatever their other economic benefits, innovative instruments are designed in part to create or expand concealment options. Moreover, trade associations and managers of systemically important institutions routinely use their political and economic clout to lobby standard-setting bodies for accounting rules that make it harder for government supervisors to monitor and to discipline their important exposures to loss.

Under the historical-cost valuation principles in use during the 1980s, US authorities allowed and even encouraged economically insolvent “zombie” institutions to hide their insolvency and to roll over their debts solely on the strength of safety-net guarantees. The rules did not make them record deterioration in the market values even of assets and liabilities for which perfect substitutes were trading regularly in an organized market. These rules (which still govern positions in a US depository institution’s “banking book”) encouraged distressed or ruined financial institutions to endeavor to grow out of their insolvency by pursuing long-shot strategies that created stockholder value by shifting responsibility for large loss exposures onto government safety nets.

In the US, a major purpose of moving to fair-value accounting was to require some of the developing losses at troubled financial firms to be recognized and resolved more promptly than in the past. It is mischievous for loss-making or undercapitalized firms to blame fair-value accounting for causing the trouble they encounter in rolling over their debt. At best, fair-value accounting is a messenger that makes safety-net managers and private counterparties aware more quickly of their need to guard against the possibility that a particular firm (such as Bear Stearns) might be seeking to fund endgame “gambles for resurrection” at their expense. Realistically, careful exploitation of the many reporting options fair-value principles convey still allows a clever manager to greatly understate developing losses. By the time accounting evidence of insolvency can emerge, well-informed interval estimates of a firm’s economic net worth would be deeply in the red.

It is completely wrong to say that, because temporarily disorderly markets may overshoot equilibrium prices, fair-value accounting “forces” financial institutions to book paper losses that have no practical importance. First, under fair-value principles, many portfolio positions are “marked to model” rather than to an actual transactions price. Managers can and do ask their quantitative staff to adjust model outcomes until they produce prespecified results. Personnel responsible for modeling decisions can do this by expanding or contracting either their samples of data points or the parameter space of their models to eliminate uncomfortable valuation outcomes. Attempts to defraud investors and creditors with models or assumptions that violate ‘prudent man’ standards of negligence should be settled in the court system. Second, risk managers are free to move assets that are sensitive to changing credit spreads either into off-balance-sheet

entities or from their firm's "banking book" to its "available-for-sale" portfolio. As in the past, GAAP asks that impairments in borrower credit that affect banking-book assets to be translated into explicit additions to loss reserves. Increases in loss reserves reduce reported earnings and (if large enough) erode accounting net worth as well. While assets that are classified as available-for-sale have to be fair-valued, the writedowns do not pass through current earnings and charges taken directly against GAAP net worth are not incorporated into Basel measures of regulatory capital that supervisors were using to determine capital adequacy. Finally, in estimating GAAP capital in an environment of illiquid or panicked markets, banks are allowed to ignore impairments implied by observable credit spreads simply by declaring that in management's considered view the impairments are only temporary.

VI. Was the crisis no more than a widespread shortage of liquidity?

When an institution encounters unusual difficulties in rolling over its debt, safety-net managers are tasked with determining whether it is experiencing a transitory shortage of liquidity or has suffered losses so large that its creditors reasonably believe that the value of its assets has fallen well below the value of its liabilities. In the latter case, the firm is economically insolvent and until and unless its capital shortage is cured, it cannot survive without safety-net support.

In principle (although often not in practice), safety-net officials are supposed to supply liquidity only to institutions that are found to be solvent. In the US, by law the insolvency of zombie banks is supposed to be resolved promptly.

The claim that severely troubled firms whose business plans made them overly dependent on securitization (such as Bear Stearns) were merely undergoing a liquidity

crisis is highly doubtful at best. Proponents of this view characterize the Bear Stearns case as if it showed that the boundary between illiquidity and insolvency had somehow dissolved. It is clear that the bank was sold for a fraction of its book value when it could not roll over its debts. But the Fed's having to absorb \$29 billion of Bear's weakest assets to get Morgan to take over its franchise provides strong evidence that its assets were worth way less than it owed. The failure and nationalization of Northern Rock – Great Britain's fastest growing mortgage bank- was similarly characterized by some as a liquidity squeeze rather than to the evident decline in the value of its mortgage portfolio. Northern Rock also financed much of the break-neck growth in its loan portfolio from securitization rather than funding itself from retail deposits. Whether it had a viable loan book is difficult to judge since a third of the fast-growing bank's mortgages were still less than two years old and the bank's stock price had been sliding since early 2007. Even as monetary policy began to tighten, the bank was offering mortgages at rates lower than those it might have expected to pay to finance them.

Creditors could not neglect the dangers inherent in both institutions' business plans, which entailed financing longer-term assets disproportionately with short-term funding from wholesale sources. In the phase of the business cycle in which interest rates trend upward, this strategy is not sustainable. Bear Stearns was perhaps the single Wall Street investment bank that invested most deeply in what we now know to have been toxic mortgages. Its mix of businesses was less diverse and it relied more heavily on overnight funding from collateralized commercial paper and repurchase agreements. Regulators hoped against hope that, after the failure of two of its hedge funds, Bear would strengthen its funding.

Once doubts emerged about the quality of securitized mortgage instruments, reliance on short-term wholesale funding contributed to the speed with which an institution could be laid low. Other securitized liabilities rapidly lost credibility and therefore liquidity as well. But creditors were ultimately concerned about the quality of the portfolios and business plans at these firms (and later at the GSEs). It was a mistake to characterize the turmoil as a liquidity crisis caused by fire-sale pricing and to hope that it could be cured by auctioning off increasingly poorly collateralized central-bank loans to distressed firms. At any highly leveraged, short-funded institution, an increase in the credit spread on its assets creates losses that must be allocated between shareholders, creditors, and the safety net. To avoid getting stuck with losses, private counterparties will only roll over a short-funded institution's debt if it can convincingly demonstrate its continuing ability to repay. Before credit spreads increased, most investors relied on CRO ratings to support their valuations. CROs' loss of credibility meant that short-funded institutions had to develop a technology for communicating and bonding their capital and loss exposures on the fly. Those who could not or would not communicate reliable information had trouble rolling over their debts. Although they might describe this as a liquidity problem, this description is incomplete. Distressed firms have to find a way to bond their ability to repay. Insisting on this is merely good underwriting by their counterparties. Given that private counterparties earn their living by making good loans, a major firm's loss of liquidity raises strong suspicions of underlying insolvency.

VII. Did financial globalization exacerbate the crisis?

The globalization of financial markets and institutions tends to heighten competition between alternative regulatory systems (Kane, 1999; 2008). Although

economists often treat regulation merely as a tax on institutional income, financial institutions understand that regulation is a service that generates benefits as well as costs. Regulatory benefits include improving customer confidence and convenience. Supporting bank efforts to accumulate and exercise market power benefits banks, while resisting these efforts benefit society. Because regulation requires resources to produce, both efficiency of its production and its pricing can vary.

In a world in which financial markets are globalized, services that provide regulatory benefits are available both from foreign suppliers and from domestic regulators of differently chartered firms. Rules and enforcement systems are continually tested and reshaped by changes in the net regulatory burdens that other jurisdictions offer. This means that a worldwide market for regulatory services exists. Regulation is supplied competitively and accepted voluntarily to the extent entry and exit opportunities exist for banks willing to incur the transaction costs of switching all or part of their regulatory businesses to another supplier. Competition has the benefit of lowering net regulatory burdens for the regulated financial institutions. While heightened international competition has tended on balance to displace poor systems of regulation by better ones, the maximum improvement in any country is limited by switching costs and by the level of best-practice regulation that can be found elsewhere.

In the current crisis, securitization helped to bring firms that were supervised in different regulatory systems into sharper competition with one another. In this environment, competition not only encouraged deregulation, it also and more importantly reduced the effectiveness of supervision. Securitization put pressure on particular regulatory enterprises to relax their scrutiny of complex innovative instruments as a way

of defending or extending their bureaucratic turf. Banking supervisors did this by legitimizing cutting-edge ways to hide and transfer risk without fully exploring the threat that only formally uninsured “shadow” affiliates and complex new contracting structures imposed on individual-country safety nets.

Whenever a regulator authorized an innovative entry by a foreign or nontraditional firm, it also had to relax restraints that might make it hard for its traditional clients to compete with the new entrants. Institutions pressed politicians to make this happen promptly. In most countries, defects in accountability led supervisors of commercial and investment banks to assess the risks of innovative instruments of risk transfer with less watchfulness than these instruments deserved. With structured securitizations, the SEC, banking supervisors, mortgage insurance firms, and investors jointly outsourced their duty of vigilance to appraisers, accountants and credit-rating organizations. They did this despite knowledge of these firms’ obvious conflicts of interest and outsized delays in recognizing problems or downgrading distressed securities in past downturns (Portes, 2008). While supervisors relaxed entry restrictions, they resisted the exit of domestically important commercial and investment banks by standing ready to let unprofitable clients be supported by safety-net bans and guarantees.

The goal of financial reform should be to induce nondiscriminatory and efficient patterns of regulation and supervision. Regulators should be made accountable not just for producing a stable financial economy, but for providing this stability fairly and at minimum long-run cost to society. In practice, this would require embracing market-based standards of supervisory performance designed to identify undercapitalized institutions promptly and to require them to shrink, raise more equity capital, or pay

higher interest rates for their debt. The globalization and information revolution that is underway in finance today makes it short-sighted to require taxpayers to subsidize weak institutions and inefficient patterns of real investment.

Regulatory efforts to respond to the globalization of financial institutions and markets have been led by the Basel committee on Banking Supervision. This committee meets regularly to discuss ways of harmonizing national standards for banking supervision. The Committee's stated objective is to eliminate perceived cross-country competitive inequalities and to improve financial stability by promoting comprehensive risk management and consistency in regulatory standards across countries for multinational firms. Its major accomplishment is to negotiate the Basel I and II capital accords. The next section looks at the role that Basel accords may have played in the recent crisis.

VIII. Has Basel II failed already?

The crisis has spawned a growing argument about the role Basel I may have played in causing the crisis and about whether Basel II, had it been implemented earlier, could have lessened the turmoil. Basel I distinguished two types of capital: Tier One Capital (core capital - roughly the same as stockholder equity) and Tier Two Capital (which includes some hybrid forms of debt). It also defines a formula for risk-weighting categorized "buckets" of similar asset holdings and summing up the weighted values to form an aggregate measure of risk exposure called "risk-weighted assets" (RWA). Banks are required to hold at least 8 percent of RWA in capital, at least half of which must be in Tier One (equity plus retained earnings).

The weights employed in Basel I gave banks no credit for the extent to which they might have diversified or hedged the risks in their loan portfolio; risk was evaluated on a loan-by-loan basis, rather than at the portfolio level taking into account covariances. The formulas also did not make any effort to account for operational, interest-rate or exchange-rate risks, though market risks were incorporated later. Finally, Basel I failed to link the risk weights it applied to particular assets to the risk premiums that can be observed in loan markets.

These weaknesses provided opportunities for arbitrage that contributed to the current turmoil: if regulatory demands for capital generated a compliance burden at a particular bank, its managers could eliminate this burden by selling or securitizing a sufficient amount of assets. For example, under Basel I, mortgages held on a bank's balance sheet were subject to a 50 percent weight, while securities backed by mortgages received only a 20 percent weight. No risk weights were assigned loans that were sold to special-purpose bank-sponsored securitization conduits, which were regarded as "off balance sheet," or to short-term lines of credit with which sponsors supported these conduits.

Proponents of Basel II argue that the new accord will ameliorate weaknesses in Basel I, since Basel II is more granular and mitigates securitization incentives by reducing the capital charge for mortgages held on the balance sheet to 35 percent and by imposing a capital charge on short-term lines of credit. Nevertheless, longstanding concerns about the Basel approach have been reinforced by the recent turmoil.

Basel II –which was negotiated in 2004, but is still in the process being implemented– was born out of widespread dissatisfaction with obvious shortcomings in

Basel I.¹⁰ The new agreement is much more complex than Basel I and rests on three mutually reinforcing pillars: (1) minimum capital requirements; (2) supervisory review of banks' capital adequacy; and (3) strengthened market discipline of capital adequacy. Besides increasing the number of risk categories in pillar one, Basel II proposes to use a mix of statistical methods and expert opinion to track a bank's changing exposure to insolvency risk over time. It also envisions improved disclosure as a way to generate complementary market discipline on bank capital positions. However, Basel II does not improve on Basel I either in how it measures capital or in the arbitrary target ratios it sets: the definitions of Tier One and Tier Two Capital and the rules limiting their components¹¹ are unchanged; and the committee continues to insist on the 4 and 8 percent minimum ratios of capital to risk-weighted assets without any rationale for why either level is appropriate.

The new accord sets out to make capital more sensitive to credit risk in one of two ways: through reliance on external credit ratings issued by rating organizations (the Standardized Approach), or through reliance on internal ratings based on bank's own risk models (the Internal-Ratings-Based Approach, IRB). The Standardized Approach requires banks to allocate their exposures to risk buckets and resembles Basel I, except that it incorporates a wider range of weights and asks countries to choose a set of external rating organizations and use their assessments of risk to determine country-level capital requirements.

¹⁰ The Basel committee itself notes that Basel II arose in response to the growth of securitization, giving the impression that this growth was an exogenous development rather than at least in part a response to Basel I and its "loan-by-loan" approach to assessing a firm's overall risk exposure.

¹¹ The Committee continues to regard subordinated debt as inferior to shareholder equity, but only because such debt is limited in its maturity. This neglects the better incentives debt establishes in monitoring risk. Whereas equity value varies directly with the returns promised from increasing risk, debtholders returns can be harmed by increasing risk. This leads first-loss debtholders to exert a more conservative influence on corporate governance than equity holders.

The IRB Approach makes use of bank's own internal risk systems for specifying minimum capital requirements, subject to the requirement that banks' internal models satisfy regulatory eligibility conditions. It has two variants: Foundation and Advanced. Under the Foundation Approach, instead of relying on external assessments of creditworthiness, banks are able to use their own estimates of probabilities of default for each borrower. These borrower-specific factors, supplied by each bank, are then combined with supervisory-determined estimates of loss given default, exposure at default, and effective maturities to arrive at regulatory risk weights. If a bank satisfies the stricter eligibility conditions to qualify for using the Advanced approach, then it can place even greater reliance on internal credit systems by using not only their estimates of the probability of default but also their own estimates of loss given default, exposure at default, and effective maturities.

Since Basel II grants national regulators substantial discretion over the implementation of these options, countries could end up with widely divergent levels of required capital. This would generate increased opportunities for regulatory arbitrage and undermine effective capital control. Indeed, standards under Basel II could cease to be global standards at all, which would defeat the original purpose of the accord.

Most importantly, recent events challenge the appropriateness of both the Standardized and IRB Approaches of measuring capital charges against credit risk. First, until CROs rehabilitate themselves, reliance on ratings organizations will be regarded as an unsafe investment strategy. Avoidance behavior has demonstrated that increasing reliance on ratings for regulatory purposes steadily degrades the quality of the information that ratings convey. The use of ratings to set risk weights encourages ratings

inflation because ratings organizations face revenue-based incentives to relax ratings requirements. During the crisis, the credibility of ratings has been damaged by frequent and large downgrades, affecting even the highest-rated tranches of claims on some securitized instruments.¹²

In addition, credit ratings do not confront the issue that capital requirements are supposed to address. Loan-loss reserves are tasked with accounting for anticipated losses. Capital requirements are intended to provide a buffer against *unexpected* risks. It does not make sense to use credit ratings to set capital requirements, since they convey no information about the volatility of an asset's return around its mean exposure to loss. Ratings may be useful for establishing loss reserves for particular assets, but they say nothing about how a bank's net worth or its portfolio of assets might vary in value with unexpected events. The amount of capital that must be set aside to achieve a particular target level of safety for a particular institution has to be linked explicitly to measures of the volatility of its earnings.

Second, the internal models employed by even the largest and most-sophisticated market participants also failed to track risk accurately. The models proved inadequate in that they systematically underestimated the types of risks in complex securitizations that produced large losses and substantial downward revisions in earnings. The Basel Committee undermined accurate modeling by deciding to treat five years of data as an adequate sample span. This time period is too short to capture a full business cycle. Moreover, for rare events, such as the U.S. housing bubble, market participants needed to factor in evolving features of the market (e.g. new types of borrowers, lower

¹² The specific risk weights used in the Standardized Approach are curious in that they can actually discourage some firms from seeking debt ratings, since unrated firms carry a risk weight of 100 percent, while low-rated firms carry a risk weight of 150 percent.

downpayments, option ARMs, etc). It is a mistake to reply mechanically on models estimated with data from periods when important features did not exist to the same extent. In addition, complex financial models and datasets can be manipulated to provide desired outcomes.

Although Basel II employs a more detailed categorization of credit risks,¹³ it fails to address “liquidity” risk and reputation risk, both of which have proved important in the current turmoil. Once doubts emerged about the accuracy and reliability of ratings and accounting net worth, holders of maturing short-term liabilities refused to renew their funding. Feedback from this so-called liquidity risk intensified credit and market risk. Reputation risk encouraged lending institutions to rescue off-balance sheet shadow entities they had sponsored even though sponsors were not contractually obliged to assume these losses. An important reason the crisis spread rapidly from subprime loans to other securitization structures and that the turmoil has persisted is that the subprime meltdown revealed that serious contracting weaknesses existed at every stage of the process of securitized risk transfer. Inadequate documentation of underlying mortgages, the daunting complexity of securitized structures for allocating and reallocating cashflows from questionable loans and the opacity of off-balance-sheet vehicles that purchase securitized instruments led investors to seek comfort not from an understanding of underlying cashflows, but from credit enhancements and the behavior of dealer spreads. Neither regulators nor market participants knew to whom risks were formally

¹³ Under pillar one, Basel II combines the evaluation of capital adequacy for credit risk, operational risk (defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events), and market risk (defined as the risk of losses in on and off-balance-sheet positions arising from market movements in interest rates, foreign exchange, and securities or derivatives prices) with incentives for banks to invest in better risk management processes to qualify for the discretion allowed under each more-advanced approach. Interest-rate risk in the banking book is relegated to the supervisory review process of pillar two.

allocated, let alone on whom potential losses might finally fall. The disclosures envisaged in pillar three of Basel II have a long way to go before they can claim to unravel these issues.

Finally, while Basel II assigns national regulators responsibility for monitoring and controlling insolvency risk, it does not develop any protocols for preventing financial institutions from becoming insolvent nor does it impose requirements for prompt corrective action (PCA) on supervisory authorities. The accord will eventually have to benchmark a pattern of actions that home and host authorities should take as the capital position of a client institution slips deeper and deeper below acceptable standards and is not promptly replenished. Detection and resolution of impending insolvencies is crucial. The central problem in financial regulation is to make sure that even in politically and economically stressful circumstances, regulators have robust incentives to protect taxpayers by identifying troubled banks and forcing them to recapitalize before their capital can become exhausted.

Basel's arbitrary "risk"-weighting process has already failed. This failure underscores the importance of enforcing PCA obligations and monitoring leverage per se. Even in the midst of crisis, large financial institutions managed to keep from violating Basel I's risk-weighted targets by gaming authorities with sophisticated (but faulty) risk-transfer techniques. For this reason during the turmoil, markets ignored RWA ratios to focus on the more transparent ratio of assets to tangible net worth as the primary indicator of financial strength.

In the U.S., when a bank's tangible capital falls below 2 percent of its assets, the FDIC Improvement Act of 1991 (FDICIA) requires bank regulators to supplement risk-

weighted measures of capital adequacy with the leverage ratio. Using their discretion, the agencies developed a ladder of other leverage-ratio categories. Institutions with leverage ratios of at least 5 and 4 percent are classified as well-capitalized and adequately capitalized, respectively. Ratios that fall below 4 percent classify institutions as undercapitalized and institutions with ratios below 2 percent are subject to closure. The 2-percent trigger trumps the risk-weighted capital measures in determining when an institution is “critically undercapitalized.” At this threshold, an undercapitalized bank that does not promptly recapitalize itself may be required to surrender its charter. FDICIA presumes that a workable endgame insolvency-resolution trigger must be tough and transparent to hold enough top regulators accountable ex post for losses suffered by the deposit insurance fund. The complex and arbitrary thresholds generated by RWA ratios do not and cannot meet this test. Before the crisis, regulators faced strong pressure to abandon or phase out their use of leverage ratio triggers. However, since RWA triggers have proved themselves unable to impose much constraint on zombie institutions, the crucial role of the leverage ratio in PCA requirements has been confirmed.

Because the volatility of and correlation between returns on different assets tend to surge in crises, the risks modern institutions take cannot be captured in a static formula, no matter how complex it might be. When static rules are also complex, they reduce transparency and generate loopholes that foster regulatory arbitrage and support acts of supervisory forbearance. To be effective, prudential regulation must be adaptive and it must combine supervisory stress tests with market oversight. To track the

changing importance of particular risks in timely fashion, supervisors must use market signals.

Current market turmoil underscores the inadequacy not only of Basel's static formulas, but also the dangers of taking accounting statements at face value. Safety-net subsidies increase effective leverage, weaken market discipline and reduce the exposure of formally at-risk loss bearers in ways that render the usual accounting disclosures ineffective. Subsidy-induced innovations can only be countered by conscientious supervision. Supervisors must not only draw on –but help to develop-- informative market signals, such as those imbedded in the prices of credit default swaps and subordinated debt. Deal making in these markets incorporates timely estimates of changing default probabilities and loss exposures. However, prices in these markets can be a strong source of discipline only under two conditions: (1) market participants do not expect to be bailed out when trouble develops and (2) investors have access to regular flows of high-quality information [Barth et al. (2006)]. A crucial element in limiting expected bailouts is to assign political accountability for measuring and defending safety-net costs to regulators and elected officials. We return to this issue in our last section.

IX. What useful lessons can be drawn from past financial crises?

Since banking emerged in medieval Italy, the world has experienced hundreds of financial crises. When a crisis is in process, interest in drawing lessons from the past surges. Unfortunately, the lessons cited are routinely distorted by blame-shifting disinformation emanating from parties and institutions that benefited from shifting risk onto their own or some other country's financial safety net. This is why popular theories

of past crises zero in on the bad behavior of a few convenient scapegoats. However, crises rarely result from the corrupt acts of a few greedy individuals or from a handful of isolated regulatory mistakes. Crises have their roots in longstanding structural flaws in the way that financial institutions and government officials interact. With rare exceptions, crises are caused by perverse incentives that make it worthwhile for politicians, regulators and the private sector to ignore mounting danger signals until it is too late to avoid a widespread meltdown in asset values.

Modern crises are often revealed by identifiable shocks that end booms or bubbles in important macroeconomic sectors, but the underlying distortions were building up for a long time. The meltdown that began in 2007 is not the first time that financial institutions, in taking advantage of regulatory loopholes, engaged in reckless risk-taking that fueled a long-lasting bubble in asset prices that in one way or another had to burst eventually. Extraordinary risk-taking is easier to disguise and rationalize during bubble or boom periods. Increasing leverage based on unsustainable surges in the price of residential and/or commercial property and corporate stock featured prominently in an end-of-the-century spate of crises: in Japan (1990s), Malaysia (mid-1980s), Mexico (1994), Sweden (1991-94), and East Asia (1997-98).

Historically, wherever a banking industry has existed, economic booms and asset bubbles often have preceded financial crises. Demirgüç-Kunt and Detragiache (2005) survey a large literature that shows that the likelihood of crises increases with the strength and duration of economic booms and that banking crises are occasioned by shocks in asset prices, output, terms of trade and interest rates. However, Demirgüç-Kunt and Detragiache (2002) assemble convincing evidence that the character of a country's

financial safety net plays a critical role in encouraging institutions to make themselves vulnerable to the particular shock that brought each crisis on.

This is not to say either that crises would not occur in the absence of a safety net or that financial safety nets should be dismantled.¹⁴ It is accurate to say that financial crises have become more frequent and more expensive (in terms of losses per dollar of deposits) as safety nets have expanded.¹⁵ By permitting losses to spread to taxpayers rather than being borne solely by contracting parties, safety nets displace market discipline (Calomiris, 1995). By making it easier to attract deposits, safety nets encourage private parties to lever themselves more extensively and increasing leverage shifts more and more of the downside onto the national safety net.

Financial deregulation is often blamed for causing crises, but the fact and character of deregulation is itself shaped by the ways that governments and regulated institutions interact. As financial regulations were relaxed in 1970s and 1980s and increasing reliance was placed on prudential supervision (with little accountability), the frequency of crises did increase.¹⁶ However, deregulation does not necessarily provide greater opportunities to shift private risk exposures onto the safety net. This happens only when authorities fail to adapt their systems of insolvency detection and resolution appropriately. In principle, relaxing controls on interest rates, charter powers and portfolio structure promised to improve banks' ability to foster economic growth and

¹⁴ Early bubbles occurred before safety nets commonly were extended to the financial sector. During the South Sea bubble, John Martin famously said "When the rest of the world are mad, we must imitate them in some measure." The size of the equilibrium "measure" is what the safety net influences. Unlike modern securities firm and commercial banks, Martin could not have hoped that the government would rescue his bank, since the Bank of England had not at that time begun to operate as a central bank.

¹⁵ Costs of resolving crises has risen significantly over time: in the late 19th and early 20th century, they ran about 2 percent of GDP; in modern times, they have averaged five to six times this figure, with some cases reaching the range of 20 to 50 percent of GDP.

¹⁶ See Demirgüç-Kunt and Detragiache (1999) for a discussion.

economic justice. But coupling deregulation with inadequate supervision of leverage and asset quality is a recipe for disaster, because “desupervision” allows safety-net subsidies to be extracted by doubling and redoubling risks.¹⁷ Blaming the current turmoil on financial deregulation without mentioning the role of deficient oversight suggests that rules --not incentives-- are at fault (Stiglitz, 2008; Krugman, 2008). During the period of deregulation, most industrialized countries introduced many new rules. The imbalance between the attention paid to rules and incentives is nicely illustrated by the 2004 Basel II agreement which devotes 16 pages to issues of market discipline and 225 pages to spelling out formulas and strategies imbedded in pillar one and options for national discretion authorized in pillar two.

Over time, regulation-induced innovation leads to progressively more complex and less transparent forms of risk-shifting. Financial crises are often driven by breakdowns in innovative financial instruments or arrangements designed to exploit loopholes in a country’s risk controls. Recent examples of risk-shifting include: overexposure to foreign exchange risk (in Chile, 1981; Mexico, 1995; Nordic countries, early 1990s; Turkey, 1994, and the East Asia, 1997); aggressive lending to politically important foreign markets (in the LDC debt crisis of the 1980s); and complex deal-making (in the securitization crisis). In seeding the current crisis, institutions abused

¹⁷ For example, the gradual deregulation in Malaysia in the early 1970s led banks to buy less of what they already held – directed loans and highly liquid claims – and to invest more in property and buildings, which had previously been only a small percentage of the banking system’s portfolio. Every year, real estate and commercial property prices rose and every year banks decided that in this ‘new world’ it was sensible to invest still more in this sector, so much so that in some years this sector absorbed over 50% of new lending. The boom in prices collapsed in the mid-1980s, as the limits of this concentration became evident. Texas banks in the 1970s were hardly much more diversified, investing in oil, real estate, and commercial buildings, whose prices were highly correlated. It was characterized as an unprecedented shock that when oil prices finally went down, so too did land prices, commercial real estate and, of course, many of the banks. Similarly, last summer, hedge fund managers claimed that events that were truly impossible to anticipate were responsible for their losses.

derivative instruments –whose existence had been rationalized as vehicles that would diversify and hedge risk-- to magnify safety-net loss exposures. Abusive trading of derivatives instruments fueled the Orange Country fiasco (Jorion, 1995) and the growth of credit default swaps (CDS).

Because institutions can count on crisis resolution to be mismanaged, safety-net subsidies flow to institutions willing to risk insolvency. Walter Bagehot’s classic policy advice for managing liquidity during a systemic crisis is for the central bank to lend freely to solvent banks – but to minimize safety-net subsidies, the loans are to be made at a penalty interest rate and only on good collateral. Put differently, his advice is for governments to *avoid* lending to insolvent banks at all, even on good collateral and certainly not at below-market interest rates. Unfortunately, modern governments pay only lip service to this principle. Supervisory authorities find it hard to mobilize the political and budgetary support needed to follow the Bagehot strategy. In their study of twelve recent crises, Kane and Klingebiel (2004) found that all but one country adopted a crisis-management strategy that combined blanket guarantees with extensive and immediate liquidity support for insolvent institutions.¹⁸

Advocates of using liquidity injections to halt a systemic crisis argue only that sweeping guarantees and extensive liquidity support can stop the panicky flight of depositors and other institutional creditors to less risky venues. But this begs the question of whether social costs and adverse distribution effects could be reduced by following an alternative strategy (Kane, 2001).

¹⁸ The crises studied occurred in: Argentina, 2001; Ecuador, 1998; Finland, 1991; Indonesia, 1997; Japan, 1991; Korea, 1997; Malaysia, 1997; Mexico, 1994; Russia, 1998; Sweden, 1991; Thailand, 1997; and Turkey, 2000. Only Sweden refused to supply extensive liquidity support to insolvent institutions.

Incentive conflict not only explains how a particular crisis develops, but how the manner in which a crisis is resolved affects the frequency and depth of future crises.

Even in the midst of a financial crisis, it is inefficient to set aside long-term goals completely. Providing extensive liquidity support and guarantees to zombie institutions subsidizes gambles for resurrection and strengthens the risk-shifting incentive schemes that spawn crises and guarantee their recurrence. Without incentive reform, short-sighted methods of crisis resolution create the expectation that they will be used again when the next crisis inevitably arrives. This expectation undermines market discipline and financial stability in future periods.

Moreover, the short-term benefits of liquidity injections have been oversold. Such policies seldom actually speed the recovery of a nation's real economy from a banking crisis or lessen the decline in aggregate output. Honohan and Klingebiel (2003) measure the impact of different crisis management strategies on the ultimate cost of resolving distress in 40 different financial crises. They find that blanket guarantees, open-ended liquidity support and regulatory forbearance significantly increase the ultimate fiscal cost of resolving crises. They also find that spending more to support distressed institutions does not speed the recovery. Instead, providing liquidity support for insolvent institutions tends to prolong a crisis. It does this by distorting risk-taking incentives so extensively that sound investments and healthy exits are delayed and additional output loss is generated.

Past crises provide important lessons, but they fall on deaf ears. History provides clear lessons about how to minimize the frequency and cost of financial crisis. The refusal to embrace these lessons underscores the existence of persistent defects in the

incentives that govern the ways in which politicians, regulators and financial institutions interact. Authorities routinely underestimate the frequency and depth of crises. When crises do occur, they prefer to resolve the conflicting pressures under which they must function by treating troubled institutions generously, claiming that it is their duty to minimize potential short-term contagion at all cost.

Underinvesting in crisis preparedness implants a preference for improvisation. But improvisation leads to inefficient and myopic solutions. In the next section, we outline principles for regulatory reform aimed not at reallocating regulatory and supervisory authority, but at establishing incentives that would lead supervisory authority and market forces to operate more effectively.

X. Principles for regulatory reform and broader implications

Given the intensity, breadth, and persistence of the current crisis, proposals for policy reforms have emerged from many quarters. No doubt many more will have surfaced by the time this paper is read. Sponsors claim that their particular scheme will minimize the likelihood and cost of future crises.

Some sources interpret recent events as evidence that market discipline is not reliable. These parties focus on designing new rules. Their proposals range from re-establishing the extensive activity restrictions adopted in the 1930s to programs that would emphasize industry best practice, speedier implementation of Basel II, or enhanced opportunities for official intervention.¹⁹ Others continue to believe in the reliability of

¹⁹ These include proposals by Krugman (2008), the Institute for International Finance (IIF), Counterparty Risk Management Policy Group (CRMPG) and the Financial Stability Forum (FSF). Goodhart (2008b) and Goodhart and Persaud (2008) recommend authorities set countercyclical capital requirements, introducing a leverage ratio that would move inversely to the business cycle.

market signals and market discipline. On the hypothesis that investors would be quicker to recognize changes in risk and risk premiums, such sources propose that official supervision focus on generating and using better market signals.²⁰

This paper stresses that the current crisis exemplifies not just the limits of market discipline, but the power of government-induced incentive distortions – and the limits of official supervision as commonly practiced. The failure of private parties to exercise sufficient due diligence was rooted in the failure of government supervisors to challenge decisions made by private accountants and credit-rating organizations. They neglected their duty of examining and publicizing the implications that these decisions might have for safety-net loss exposure. By tolerating a decline in transparency, supervisors made it difficult to recognize and price the risk expansion not only for themselves, but also for the market participants.

Authentic reform must address the contradictory political and bureaucratic incentives that led regulators and supervisors first to outsource their due diligence, and then to resolve the crisis in inefficient ways. Incentive reform is politically difficult because existing defects in supervisory incentives did not come about by accident. They reflect the political preferences of regulated institutions and other politically powerful market participants. No matter how drastically a proposed reform may redistribute supervisory authority, unless it also establishes accountability and transparency for the costs of safety-net management, effects will prove more ostensible than real. For this reason, our program of reform focuses on improving the chain of incentives under which market discipline and official supervision operate.

²⁰ See proposals by the Shadow Financial Regulatory Committee, which can be found on the American Enterprise Institute (AEI) website.

1. Lender Reform: Compensation for loan officers must be linked to long-term performance rather than to short-term profits. Originators must bond more effectively the quality of the loans they securitize. As long as market participants' incentives to conduct due diligence are not undermined by contingent safety-net support, we can expect this kind of adjustment to be driven by private error-learning: Once burned, twice shy. Lender incentive realignment will be enforced by parties further down the securitization food chain. Examples of better bonding arrangements include: covered bonds; a forfeitable holdback of payments from loan sales; deferred compensation for loan officers that is forfeitable if defaults exceed a specified standard; and restrictions on the size and retention of each originator's equity tranche. Governments can reinforce (rather than undermine) market discipline by assisting in the dissemination of information about contract evolution and by encouraging development of better information systems. For example, it would be useful to require large institutions to sell credit default swaps and subordinated debt at regular intervals.²¹

2. Credit Rating Organization (CRO) Reform: Credit rating organization reform should incorporate two main elements: (i) withdrawing government blessings from their work and (ii) improving CRO accountability for ratings decisions. With respect to the first issue, because credit rating organizations are profit-making organizations, they should be made to stop calling themselves "agencies." This self-congratulatory name gives the impression that they resemble government agencies. Because the NRSRO designation provides an explicit government blessing and introduces barriers to entry into

²¹ We recognize that these instruments could be abused, for example if banks were allowed to issue subordinated debt to related parties, who would not offer much discipline; or to the extent companies underprice CDS and then default when payment is due. Thus some regulation would be required in order for these requirements to contribute to the safety of the banking system (Kashyap, Rajan and Stein, 2008).

the ratings business, it should be eliminated as well. Most importantly, references to ratings should be removed from all SEC and bank regulations, including Basel II. Government rules that rely on CRO ratings reduce investor incentives to conduct sufficient due diligence before making investments. At the same time, such rules reduce the accountability of government regulators and supervisors for neglecting their duty of oversight. By outsourcing due diligence to credit rating organizations, regulators shift the blame for the safety-net consequences of ratings mistakes away from themselves.

Clearly, credit rating organizations must be made more accountable for the quality of ratings they provide. Individual CROs can only recover the damage their brand has suffered by taking responsibility for their mistakes. For securitized claims, this could be done by requiring CROs to publish an ex ante margin for error with each credit rating and to publish the data used in establishing complex claims so that outsiders can fact-check their inputs and challenge and improve the modeling. This provides a nonbureaucratic way to subject ratings decisions to effective independent review (cf. Goodhart, 2008a).

3. Securitization Reform: Securitization outsourced responsibility for appraising and monitoring the quality of loan pools to securitizers and CROs, parties who hardly proved worthy of so much trust. To allow investors to do more of their own due diligence, securitizers must now develop meaningful ways to assemble and deliver relevant information to the investor community. The information needed must track the changing value and risk of individual pools and of claims written upon them. A good start would be to report monthly balance sheets and income statements for each underlying asset pool and to explain to holders of structured claims on these pools what

each turn in the data implies about the value of the subordination structure supporting various tranches.

An alternative approach has been recommended by the Counterparty Risk Management Policy Group (CRMPGIII) led by Gerald Corrigan of Goldman Sachs. The CRMPGIII plan seeks to establish tough suitability standards for investors allowed to dabble in complex instruments. The standards would outsource government supervisors' duty to monitor risk-taking in "high-risk complex" claims to "large integrated financial intermediaries" whose staffs would be required to develop the capacity to analyze counterparty loss exposures in timely fashion ("in a matter of hours") and to communicate information on high-risk counterparties promptly to senior management. For complex securitizations, this would take CROs out of the process and replace them by firms that, in a crisis, authorities are almost sure to find too difficult to fail and unwind (TDFU). This solution transforms the supervisory problem into establishing a dual capacity: (1) to be able to define "complex" and "large" in an evolutionary way, and (2) to be able to monitor the strength of TDFU institutions closely enough to keep them from using their privileged positions to extract even larger safety-net subsidies. Even if regulatory incentives were improved in some way, this solution does not resolve the problem of controlling safety-net subsidies. It presumes a degree of self-control and public-mindedness on the part of the managers of profit-oriented firms that managers of CROs and GSEs have shown themselves unable to achieve.

4. Accounting Reform: The SEC and bank regulators must take back from accountants the ability to approve the off-balance-sheet spin-off of securitization vehicles. Also, to preserve opportunities to intervene early at distressed firms, authorities

must *not* abandon fair-value accounting. Rather they should strive to make accounting statements more accurate by estimating margins for errors and requiring commercial and investment banks to help authorities to track and publicize the value of safety-net subsidies.

5. Improve Government Accountability: For individual countries, systemic crises are infrequent events. This means that incumbent policymakers seldom have direct experience in working through the crisis-driven stresses generated by lobbyists for insolvent institutions. While improvisation works for well-practiced jazz musicians, the current crisis amply illustrates that, in crisis management, it deteriorates into methods of wholesale financial-institution rescue. Crisis-management decisions are full of errors because they are made in stressful circumstances by unpracticed policymakers who feel that their career in government service is on the line (Kane and Klingebiel, 2004). Decisions about which institutions to rescue and how to save them tend to follow the path of least resistance. This invariably entails bailing out deeply insolvent institutions and extending the dimensions of the safety net in way that, by further subsidizing risk-taking, sow the seeds of future crisis.

To avoid short-termism, crisis-management decisions should be made in an open debate *outside* of an actual crisis. Accountability would be improved by requiring that regulators establish and regularly test a well-publicized benchmark plan for crisis resolution. The events of the current crisis confirm that not planning for crises prolongs and deepens the disruption by tempting regulators to subsidize loss-making institutions at taxpayer expense. The damage a crisis works on a country's financial sector and its real economy can be reduced by taking market-mimicking actions that promptly estimate and

allocate losses during the early stages of a crisis. The critical first step is to call a timeout to allow forensic accountants to separate the hopelessly insolvent institutions from potentially viable ones. Authorities need forensic information to resolve insolvencies in ways that protect taxpayers and avoid subsidizing further risk-taking.

In and out of crisis, regulators need to draw on market signals to help them to track risk. A promising way to do this is to require at least the largest banks to issue at regular intervals a series of credit default swaps (CDS) and/or to issue large amounts of credibly uninsured subordinated debt.²² Transactions prices for these instruments can be incorporated into information systems that the supervisors can use to improve their assessments of safety-net loss exposures. This is because holders of these instruments would apply the market discipline that pillar three of Basel II seeks to harness.

Most importantly, it is necessary to strengthen the safety net by making authorities more accountable for its costs. Interactions between large banks and supervisory agencies could be made more transparent if both were required to estimate and to disclose the amount of these subsidies on their books. This requires the development of a system of fair-value accounting for intangible safety-net subsidies. If the probability of bailouts can be reduced, regulators can use CDS prices to estimate individual-institution and aggregate values of safety-net subsidies (Kane, 2008). For example, the spread at which credit default swaps trade can be used to strip out the value of the safety net subsidies imbedded in that firm's market capitalization.

In government enterprises, decision-making horizons could be lengthened if employment contracts included a fund of deferred compensation that heads of

²² As Calomiris (1997) and Evanoff and Wall (2001) explain, expectations of implicit support would contaminate the signal.

supervisory agencies would have to forfeit if a crisis occurred within three or four years of leaving their office (Kane, 2002). Calomiris and Kahn (1996) show that such a system worked well in the 19th century Suffolk banking system, where claims to deferred bonuses were paid only after losses had been deducted. The public embarrassment of having to forfeit compensation would incentivize top supervisors to use market signals more efficiently and help them to resist political pressure to bail out zombie firms.

None of these accountability enhancements --better crisis preparedness, greater use of market information to track risks and subsidies, publicizing estimates of safety-net subsidies or offering deferred compensation—would be costly to implement.

6. *Basel II*: Because credit ratings and sophisticated risk-management models have been discredited, it is clear that Basel II must be re-worked significantly. Some have suggested that the Basel Committee acknowledge that risk-management standards have changed so much that it is necessary to move directly to a new agreement: Basel III. Ideally, pillar two of the new system would include a simple leverage requirement and PCA rules for structured early intervention into the operations of loss-making firms. This would further enhance supervisory and regulatory accountability. Framers of the new accord should find ways to use market signals from CDS and subordinated-debt markets to estimate and disclose how regulatory decisions in different countries affect safety-net costs in other countries.

What policy lessons can developing countries take from the recent crisis? In most crises, the pain that financial-center countries suffer is felt far more intensely at the periphery. However, few developing countries were directly affected by the securitization meltdown. This is because securitization is less common in developing

countries and few institutions in these countries can depend on wholesale funding to fuel permanent growth. Still, the lessons of the crisis for regulation and supervision are as relevant for regulators in developing countries as for anyone else. The main objectives of financial regulation are the same everywhere and good regulatory design requires attention to public-service incentives. In any country, transparency and accountability are needed to keep the incentives of government officials aligned with the long-run interests of the society as a whole. The breakdown of official supervision in several of the most highly developed countries in the world shows that incentive alignment is never an easy task. Institutional weaknesses undermine accountability in government and transparency in policy making can help to remedy this anywhere.

Early statements by US officials have tended to label the securitization meltdown as purely a “market failure.” It is important to understand that the market’s failures were embedded in a parallel failure in government supervision. Giving more power to regulators without first improving their incentives will not fix anything important. One cannot improve the quality and effectiveness of government regulation and supervision merely by rewriting a few rules and mission statements. Even in countries whose markets are unsophisticated, good incentives and reliable information can produce effective regulation. That bad incentives generate misinformation and painful losses is the cumulative lesson that this and other crises impart.

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