THE FAILURE OF PRIVATE ORDERING AND THE FINANCIAL CRISIS OF 2008

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I. INTRODUCTION

In October 2008, Alan Greenspan, the former Chairman of the Federal Reserve Board, appeared before a committee of the House of Representatives and pronounced himself "in a state of shocked disbelief" that sophisticated market participants had permitted themselves to engage in an orgy of reckless lending and ill-advised risk-taking and, in the process, had failed to protect themselves from their own fecklessness.[1] The consequence of this failure was the near-collapse of credit markets and a more general deterioration of economic conditions during the second half of 2008, continuing into 2009 (the "Financial Crisis of 2008"). Although a number of specific forces operating in concert produced the dramatic market disruptions that motivated Mr. Greenspan's shock, perhaps the single most important was the failure of sophisticated investors in financial markets to conform to an ideological vision of efficient markets. Such a vision understands markets to be sustainable and self-correcting institutions, which require little if any regulatory oversight. This vision understands that incentives will induce parties to engage in private ordering of transactions, thereby promoting efficient outcomes and dissuading opportunism. This vision of market behavior motivated much of the deregulatory swing that dominated much of the past three decades. Recent events indicate that the impetus for deregulation may have run its course and that a new regulatory way forward will be required.

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1. *The Financial Crisis and the Role of Federal Regulators Before the H. Comm. of Government Oversight and Reform*, 111th Cong. 2 (2008) (statement of Alan Greenspan, former Chairman of the Federal Reserve Board), *available at* http://oversight.house.gov/documents/20081023100438.pdf.

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This Article is one of the first to delve into the systematic causes of the Financial Crisis of 2008 and to propose policy changes to address the underlying regulatory weaknesses revealed by the crisis. More importantly, this Article begins a more general inquiry into the failure of private ordering mechanisms to protect markets during the Financial Crisis of 2008 and suggests that our collective mistake has been in designing a regulatory structure that adopted the assumptions of an overly ideological vision of the market model that ignores market failures (transaction and agency costs, as well as behavioral phenomena).[2] This Article argues that an over-reliance on private ordering has systematically failed to generate robust responses to market failures. The fragility of private ordering suggests that, going forward, we must reorient our regulatory structures. Rather than rely primarily on private ordering, a more active regulatory structure is required to support robust institutions with private ordering playing a supporting role. Additionally, any new regulatory effort must recognize that market participants often systematically misprice assets in the marketplace and design a pragmatic structure that limits the ability of such mistakes to act as financial accelerators in times of distress.[3]

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2. In a world where information is costless and market participants are rational actors without agency costs, they will protect themselves through private ordering. Indeed, in such a world, there may be little place for regulation and the law. Of course, recent experience suggests that placing total confidence in markets and market participants may go too far. R.H. COASE, THE FIRM, THE MARKET, AND THE LAW 15 (1988) (noting that a world with zero transaction costs does not exist); *see also* Robert C. Merton & Zvi Bodie, *Design of Financial Systems: Towards and Synthesis of Function and Structure*, 3 J. INV. MGMT. 1 (2005), *available at* http://www.people.hbs.edu/rmerton/Designpaperfinal.pdf.

3. Two asset price bubbles during the past decade are ample evidence of our collective susceptibility to bubbles. Kindleberger notes euphoria as critical to the development of a bubble in asset prices. CHARLES P. KINDLEBERGER & ROBERT ALIBER, MANIAS, PANICS, AND CRASHES: A HISTORY OF FINANCIAL CRISES (2005). Schiller similarly notes that market participants are often guided by "animal spirits." ROBERT J. SCHILLER, IRRATIONAL EXUBERANCE (2006). Lack of perfect foresight combined with self-delusion of the type described by Kindleberger and Schiller makes it difficult, if not impossible, to effectively legislate against the development of asset bubbles. However, it is not impossible to create regulatory circuit breakers to cabin risks in times of distress and thereby limit the danger posed by such speculative activity.

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The problems of asymmetric information and lemons markets are ever-present in financial transactions.[4] Unless there are sufficient contractual safeguards in the form of private ordering or formal regulatory structures, financial markets will be vulnerable to opportunistic behavior by counterparties exemplified by the occasional panic and market crash.[5] Until the Financial Crisis of 2008, the dominant approach towards regulation held that sophisticated market participants would seek to protect themselves by relying on private ordering mechanisms, and thus, intrusive government regulation would be both unnecessary and inefficient.[6] Not-

4. Both adverse selection and moral hazard are problems of asymmetric information and are symptomatic of lemons markets. Where adverse selection is present, the seller has more information about the underlying value of an asset than the buyer and the seller is able to conceal that information. Consequently, the average value of assets in the market will be less than an "independent marker" that sets the average price for the market (a "lemons market"). Where moral hazard is present, a buyer of, for example, an insurance policy, has more information about his *ex post* behavior than the insurer. Knowing that he will not bear the full burden of the costs of his actions encourages the buyer to take on more risk than is optimal from the point of view of the insurer. George Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 84 Q. J. ECON. 488 (1970), *available at* http://www.econ.ox.ac.uk/members/christopher.bowdler/akerlof.pdf; *see also* Hayne E. Leland & David H. Pyle, *Informational Asymmetries, Financial Structure, and Financial Intermediation*, 32 J. FIN. 371, 371 (1977); Dwight M. Jaffee & Thomas Russell, *Imperfect Information, Uncertainty, and Credit Rationing*, 90 Q. J. ECON. 651, 651-52 (1976) (lemons markets in lending).

5. Walter Bagehot, LOMBARD STREET: A DESCRIPTION OF THE MONEY MARKET 21 (Echo Library 2005) (1873) (describing how a lack of confidence in counterparties leads to a panic in the financial market); *see also* Ben Bernanke, *Clearing and Settlement during the Crash*, 3 REV. FIN. STUD. 133, 142 (1990) *available at* http://rfs.oxfordjournals.org/cgi/reprint/3/1/133 (noting that financial markets may be susceptible to information asymmetry problems); Leland & Pyle, *supra* note 4 (also noting that financial markets may be susceptible to information asymmetry problems).

6. One of the principal academic contributions that marked the intellectual high point of the revolution in finance was the publication of Maurice Kendall's hypothesis of the efficient capital markets in 1953. M.G. Kendall, *The Analysis of Economic Time-Series, Part I: Prices*, 116 J. ROYAL STAT. SOC'Y 11 (1953), *available at* http://www.jstor.org/stable/2980947. This and subsequent developments in finance were enthusiastically imported into the law regulating corporations and financial markets. For example, the Supreme Court adopted a "fend for themselves" standard for sophisticated investors with respect to securities issuances in *Ralston Purina* as a basis for market regulation. SEC v. Ralston Purina Co., 346 U.S. 119 (1953).

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withstanding this view, in the absence of regulatory supervision, credit and derivative markets increasingly began to resemble financial lemons markets in the years leading up to the Financial Crisis of 2008.[7] Securitization and credit derivatives, which were intended to be private ordering innovations adding to market resilience, became sources of information asymmetries and general market instability.

The ability of a mortgage originator to package and sell mortgage assets through securitization created an incentive for mortgage originators to engage in adverse selection. This was particularly true at the tail end of the recent real estate bubble when securitized assets continued to receive AAA ratings despite the lower quality of the loans making up the pool. Second, the opaque nature of the credit derivative (i.e., credit default swap) market made it difficult, if not impossible, for counterparties to assess the risks other market participants were accepting, thereby leaving them vulnerable to moral hazard risks as counterparties took on more risk than was optimal. In both cases, these market failures were facilitated by regulatory structures that relied on private parties, including rating agencies, to manage risks rather than more intrusive government regulation. In both cases, these private parties failed to effectively manage the risks leading to a financial lemons market. This financial lemons market turned out to be a dangerous financial accelerator transmitting negative shocks throughout the financial system.[8]

Finally, the growing complexity of the securitized asset and derivative markets led even sophisticated investors to search for rules of thumb, or heuristics, to help guide investment decisions. In the run up to the Financial Crisis of 2008,

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7. The presence of asymmetric information in the financial markets can lead to a loss of trust and collapse as suggested by Akerlof in his lemons market model. Akerlof, *supra* note 4 (for a discussion of the lemons market).

8. Ben Bernanke et al., *The Financial Accelerator and the Flight to Quality*, 78 REV. ECON. & STAT. 1 (1996), *available at* http://people.bu.edu/sgilchri/research/restat_96.pdf (defining financial accelerators). In 2002, Warren Buffet accurately predicted how a daisy-chain of counterparty failures could lead to a broader collapse. Berkshire Hathaway Inc., 2002 Annual Report Letter to Shareholders, at 15 (Feb. 21, 2003), *available at* http://www.berkshirehathaway.com/letters/2002pdf.pdf. Warren Buffett's understanding of this daisy-chain problem stems partly from his involvement with Long Term Capital Management in 1998, which he nearly rescued from collapse. ROGER LOWENSTEIN, WHEN GENIUS FAILED 181-84 (2000).

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the private rating agencies provided letter-grade ratings to assist investors. Although the ratings were intended to play an important private ordering role, they were susceptible to a conflict of interest with issuers of securities. At the same time, investors placed undue reliance on this heuristic. Ultimately, the letter-grade ratings facilitated the development of lemons markets for securitized products and moral hazard in the credit derivatives market.

The proper role of regulation of the financial system should be to reduce the likely negative externalities associated with the occasional, yet predictable, speculative bubble, while preserving incentives for risk taking. For instance, creating circuit breakers between different segments of the financial system provides regulators with opportunities to break the daisy-chain connections that create systemic risk in times of stress. It also ensures that while some sectors are able to pursue high-risk activities, other sectors, like banking, are segregated from such risk taking. This pragmatic approach thus balances maximization norms with a requirement for stability in the financial system resulting in less systemic risk and a more sustainable growth trajectory going forward. A more workable regulatory structure also requires that parties reduce their reliance on faulty heuristics, like letter-grade credit ratings. However, such an approach requires a wholesale reinvention of our basic course of financial regulation as it has developed over the past three decades.

This Article proceeds as follows: Section II identifies the roots of the Financial Crisis of 2008. Three inter-related issues (deregulation and financial innovation; easy credit; and the subsequent housing bubble), while not the exclusive causes of the Financial Crisis of 2008, were central to it. In particular, this section highlights the regulatory system's reliance on private ordering to manage risk and constrain opportunistic behavior by counterparties. Section III examines the incentives in the securitization process that created a systematic adverse selection bias. Private parties in these markets relied on ratings as a rule of thumb to guide their decision making and to constrain opportunistic behavior. Rather than alleviate information asymmetries, reliance on these heuristics may have generated incentives for the development of a lemons market for securitizations. Section IV examines the development of moral hazard arising from the opaque over-the-counter market for

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credit default swaps. Again, reliance on heuristics to assess the risk profiles of sellers of default swaps resulted in sellers taking on more risk than was optimal when these heuristics proved incapable of capturing the true underlying risk being shouldered by sellers of default swaps. This moral hazard resulted in fragile central counterparties, like AIG, that collapsed when stressed. Section V examines the linkages in the financial system that tied the lemons market in the securitization process to the moral hazard problems of the credit default swap market. The strength of these linkages accelerated financial stresses in one sector of the market and helped transmit them throughout the system, leading to a more generalized crisis in the credit markets. Section VI begins a reconsideration of our basic approach to regulation of financial markets in the aftermath of the collapse of credit markets.

This Article proposes a wholesale rethinking of our approach towards regulating financial markets. The new approach must supplement our current understanding of markets and how they work and not be based on an ideological vision of markets. Such an approach does not presume that efficient markets will result from a lack of regulation. Rather, it recognizes that markets are complex institutions and that behavioral phenomena, as well as transaction and agency costs, can cause systemic market failures. This new, more pragmatic approach recognizes that regulation must promote increased efficiency while at the same time improving the ability of the financial system to withstand shocks that are the product of inevitable systematic market failures.

This Article recommends a number of interim steps that should be taken to address weaknesses identified in the securitization process and in the default swap market. First, the securitization markets must be restructured to increase the reliance on covered bonds, thereby reducing incentives for market participants to create a lemons market for such securities. Second, a clearinghouse structure for credit derivatives must be implemented in order to improve market resilience. Additionally, the use of "synthetic" credit derivatives should be eliminated. Finally, this Article recognizes the central role played by credit rating agencies in the development of financial lemons markets leading up to the recent crisis and endorses steps presently being undertaken by the SEC to de-emphasize the private ordering role of those agencies.

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These changes, however, are secondary to the larger project of redefining the current approach to regulation of our financial markets. In particular, the events of 2008 suggest that private ordering as a central component of the regulatory effort has largely failed to create resilient financial markets. In fact, the financial markets resulting from a private ordering approach pursued over the past three decades have proved themselves dangerously fragile. A new approach to regulating financial markets needs to be focused on restoring a balance to risk taking and increasing market resilience. Redefining the regulatory approach must, however, begin with a recognition of the limits of private ordering strategies.

II.
ROOTS OF THE FINANCIAL CRISIS OF 2008

Although there are many causes of the Financial Crisis of 2008, ultimately three issues lie at its root. First, financial innovation and the corresponding long-term move towards liberalization and self-regulation of financial markets created the space for the crisis to develop. Second, following the collapse of the tech stock bubble and the events of 9/11, ultra-low interest rates, intended to generate a "soft landing," created incentives for financial institutions and households to increase their borrowing. Finally, market players convinced themselves, in spite of recent evidence to the contrary, that asset prices would not decline.[9]

A. *Deregulation of Financial Markets*

Innovations in finance theory set off a round of deregulation and liberalization of financial markets during the 1980s and 1990s. The intellectual godfathers of this revolution in fi-

9. The economist Bagehot once noted that "all people are most credulous when they are most happy." No doubt the prospect of making money deadened the instincts of those who knew better. Bagehot, *supra* note 5, at 63; *see also* RICHARD THALER, THE WINNER'S CURSE (1992); DANIEL KAHNEMAN, PAUL SLOVIC & AMOS TVERSKY, JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES (1982); and BEHAVIORAL LAW & ECONOMICS (Cass R. Sunstein ed., 2000) (the work of behavioral economists also highlights the optimism bias).

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nance were Ronald Coase and Maurice Kendall.[10] Coase suggested that in a market with perfect information and zero transaction costs, market actors will engage in private ordering in order to assure efficient allocation of resources.[11] Kendall, noting that stock prices appeared random, hypothesized that changes in prices were the result of self-interested, rational actors responding to new, unanticipated information.[12] Together, these insights began a revolution in finance and laid a foundation for deregulation of financial markets. Indeed, Kendall's *efficient capital market hypothesis* quickly became a truism so that by 1970 Eugene Fama could declare that "the evidence in support of the efficient capital market hypothesis is extensive, and . . . contradictory evidence is sparse."[13]

The power and simple elegance of market-based regulation and private ordering took hold during the 1970s when governments and policymakers appeared unable to supply answers to the challenges of the day.[14] Governments facing the duel problems of inflation and economic stagnation appeared incapable of providing leadership. Price controls and other ham-handed approaches to government intervention proved ineffective.[15] A strong efficiency argument was made that governments and government regulation, in capital markets as in other areas, created distortions resulting in allocative inefficiencies.[16] By permitting markets to govern themselves, the result would be more efficient allocations of resources and eco-

10. R.H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960); Maurice Kendall, *The Analysis of Economic Time Series, Part I: Prices*, 96 J. ROYAL STATISTICAL SOC'Y 11 (1953).

11. Coase, *supra* note 10.

12. Kendall, *supra* note 10.

13. Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 J. FIN. 383, 416 (1970), *available at* http://www.jstor.org/stable/2325486 (although to his credit, Fama recognized that his results were strongest with respect to the weak form of the efficient capital markets hypothesis).

14. DANIEL YERGIN & JOSEPH STANISLAW, THE COMMANDING HEIGHTS: THE BATTLE FOR THE WORLD ECONOMY 109-11 (1998).

15. *Id.* at 110.

16. Barth et al. call this the "private interest view" of banking regulation. JAMES R. BARTH, GERARD CAPRIO, JR. & ROSS LEVINE, RETHINKING BANK REGULATION 47-48 (2006).

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nomic growth.[17] The public interest view of bank regulation that had dominated much of the banking industry since the Depression began to wane.[18] The deregulatory approach that came to dominate much of the last quarter of the twentieth century was central to the development of capital markets.

The process of deregulation of the 1980s and 1990s was characterized by a combination of regulatory action emanating from the Federal Reserve and legislation. Formal deregulation of the banking sector came in 2000 via the Gramm-Leach-Bliley Act of 2000, which repealed the Glass-Steagall Act and ushered in the era of "broad banking."[19] The repeal of Glass-Steagall ended prohibitions against bank holding companies ("BHC"s) offering banking, securities, and insurance services.[20] In fact, the act was a ratification of a process of deregulation of the banking system that had already been underway for some time.[21]

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17. YERGIN & STANISLAW, *supra* note 14 (documenting the deregulatory shift in attitudes during the last quarter of the twentieth century); *see also* ALFRED E. KAHN, THE ECONOMICS OF REGULATION (1988).

18. BARTH ET AL., *supra* note 16.

19. The Interstate Banking Efficiency Act of 1994 permitted bank holding companies to operate branches across state lines. *See* Allen N. Berger, Rebecca S. Demsetz & Philip E. Strahan, *The Consolidation of the Financial Services Industry: Causes, Consequences, and Implications for the Future*, 23 J. BANKING & FIN. 135 (1999), *available at* http://www.newyorkfed.org/research/staff_reports/sr55.pdf; *see also* CHARLES W. CALOMIRIS, U.S. BANK DEREGULATION IN HISTORICAL PERSPECTIVE (2000), at xiv-xvii.

20. James R. Barth, R. Dan Brumbaugh Jr. & James A. Wilcox, *The Repeal of Glass-Steagall and the Advent of Broad Banking*, 14 J. ECON. PERSP. 191 (2000), *available at* http://www.jstor.org/stable/2647102. During the 1920s, banks lent to stock speculators on margin. When the market crashed, a combination of plummeting asset values, margin calls, and bank runs then forced nearly 4,000 banks to shut their doors. One important aspect of the Glass-Steagall act was to separate the business of banking from speculation in the equity markets. *See* MILTON FRIEDMAN & ANNA J. SCHWARTZ, A MONETARY HISTORY OF THE UNITED STATES 1867-1960 351-59 (1971).

21. Barth et al., *supra* note 20; *see also* Keith Bradsher, *U.S. Proposes Letting Banks Enter New Fields*, N.Y. TIMES, Nov. 29, 1994, at D1, *available at* http://www.nytimes.com/1994/11/29/business/us-proposes-letting-banks-enter-new-fields.html (experimentation with broad banking); *see also* Stephen Labaton, *3 More Banks Given Authority to Trade Stocks*, N.Y. TIMES, Jan. 16, 1991, at D2 *available at* http://www.nytimes.com/1991/01/16/business/3-more-banks-given-authority-to-trade-stocks.html (experimentation with broad banking). The 1998 merger of Travelers and Citibank was hoped to usher in the efficiencies of broad banking by permitting customers to get access to a financial supermarket. Ultimately, this model has proven itself

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For example, Section 20 of the Glass-Steagall Act prohibited banking institutions from underwriting or otherwise dealing in securities ("bank ineligible" assets).[22] This prohibition can be traced back to a belief by regulators that banks' use of affiliates to engage in securities underwriting and dealing had been one of a series of causes of the stock bubble leading to the crash of 1929.[23] In 1987, the Federal Reserve permitted bank holding Companies to apply to create securities affiliates that would have limited rights to underwrite and deal in securities, including "bank ineligible" securities, provided revenues from ineligible securities (including asset-backed securities and derivative transactions) did not exceed 5 percent of the affiliate's revenue.[24] In 1997, the Federal Reserve raised this limit to 25 percent.[25] Finally, with the repeal of Glass-Steagall in 1999, this limit was lifted altogether, thus permitting bank holding companies, through their subsidiaries, to engage in trading and underwriting of securities previously off limits.[26]

The consensus opinion at the time, consistent with finance theory, was that permitting banks and bank holding companies to engage in "broad banking" would permit these institutions to diversify their activities and thus "reduce BHC

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more susceptible to systemic risk than "narrow" banks. *See* Citigroup Inc., Current Report (Form 8-K) (Jan. 16, 2009) (announcing break up of Citigroup into a "good bank" (Citibank) and a "bad bank" (Citi Holdings). This recent effort at creating a financial supermarket was not Citibank's first. In the 1920s, under the leadership of Charley Mitchell and then known as National City Bank, it attempted the same strategy with its securities and underwriting affiliate, National City Company. *See* FREDERICK LEWIS ALLEN, THE LORDS OF CREATION 312-15 (1935).

22. BANKING ACT OF 1933, Pub. L. No. 73-66, § 20, 48 Stat. 162 (1933).

23. Glass-Steagall prohibited banks from, among other things, engaging in the underwriting and dealing of securities, and also prohibited banks from holding on their books "bank ineligible" assets (securities, including ultimately CDOs and other asset-backed securities and derivative swaps). This prohibition may have stemmed from the abusive practices of National City Bank's National City Company, a securities affiliate, during the 1920s. *See* ALLEN, *supra* note 21, at 440.

24. CALOMIRIS, *supra* note 19, at xiv.

25. *Id.* at xv; Barth et al., *supra* note 20, at 194; *see also* Gramm-Leach-Bliley Act, Pub. L. No. 106-102 § 103 (1999).

26. Pub. L. 106-102. Prior to the Depression, banks were permitted to engage in the trading and underwriting of securities through their affiliates.

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risk and, in particular, the probability of bankruptcy."[27] Permitting banks to manage their own risk through diversification into broad banking would, in the abstract, result in self-interested, rational banks making more efficient allocations of capital across markets and market segments than would be possible in a more hands-on regulatory environment.[28] Indeed, others pronounced an expectation that "broad banking" would create internal incentives for banks to engage in private ordering in order to mitigate risks and thus increase the value for shareholders.[29]

In 2000, Congress also considered the question of regulation of financial derivatives. These products were regulated neither by the SEC nor the Commodity Futures Trading Commission ("CFTC") because they were traded "over-the-counter" in private, negotiated transactions.[30] The lack of regulatory oversight led to questions about the enforceability of these contracts.[31] If derivative contracts were securities, they should properly be subject to the regulatory jurisdiction of the SEC. If they were futures, then the CFTC would have proper jurisdic-

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27. Simon Kwan & Elizabeth Laderman, *quoted in* Barth et al., *supra* note 20, at 199. Calomiris notes that there was little opposition from academics to deregulation of banking activities, suggesting a consensus that Glass-Steagall prohibitions were inefficient. CALOMIRIS, *supra* note 19, at xvii.

28. In fact, one result of this reform appears to have been a cultural shift within these organizations to accept, or pursue, more risk. *The Long Demise of Glass-Steagall*, Frontline: The Wall Street Fix (May 8, 2003), http://www.pbs.org/wgbh/pages/frontline/shows/wallstreet/weill/demise.html (on the culture of risk in the securities industry versus the culture of protection in the banking industry); *see also* Gretchen Morgenson, *The End of Banking as We Know It*, N.Y. TIMES, Jan. 18, 2009, at BU1, *available at* http://www.nytimes.com/2009/01/18/business/18gret.html (noting the importance of the cultural shift towards more risk on the part of banks following the Gramm-Leach-Bliley Act).

29. Randall S. Kroszner & Raghuram G. Rajan, *Organization Structure and Credibility: Evidence from Commercial Bank Securities Activities before the Glass-Steagall Act*, 39 J. MONETARY ECON. 447 (1997), *available at* http://dx.doi.org/10.1016/S0304-3932(97)00022-6 (arguing that internal incentives of 1920s banks resulted in high quality self-regulation).

30. *See* Anthony Faiola, Ellen Nakashima & Jill Drew, *What Went Wrong*, WASH. POST, Oct. 15, 2008 at A1, *available at* http://www.washingtonpost.com/wp-dyn/content/article/2008/10/14/AR2008101403343.html; *see also* Lynn A. Stout, *Why the Law Hates Speculators: Regulation and Private Ordering in the Market for OTC Derivatives*, 48 DUKE L.J. 701 (1999), *available at* http://www.law.duke.edu/shell/cite.pl?48‡uke+L.+J.+701¶df.

31. Faiola et al., *supra* note 30 and Stout, *supra* note 30.

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tion to regulate their sale. Without regulatory clarity, parties entering into these contracts ran the risk of running afoul of regulators or becoming subject to a regulatory skirmish. This uncertainty, some believed, might stymie development of such financial products.[32]

Thus, there was an impetus to provide some legal certainty for the status of such contracts. In testimony before Congress, officials from the Federal Reserve, the SEC, and the CFTC were all of the same opinion: sophisticated investors doing transactions with sophisticated counterparties have sufficient ability to generate private ordering solutions in order to "protect themselves against fraud and unfair practices" in the trading of derivatives.[33] Regulators concluded that financial derivatives—credit default swaps in particular—should not be subjected to regulation.[34] The Commodity Futures Modernization Act of 2000 excluded financial derivative products meeting certain conditions from regulatory oversight, and thus, provided parties entering into transactions involving such products with the certainty that they would be enforceable.[35]

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32. *Id.*

33. H.R. 4541, *The "Commodity Futures Modernization Act of 2000" Before the H. Comm. on Banking and Fin. Servs.*, 106th Cong. (July 17, 2000) (statement of Patrick M. Parkinson, Assoc. Dir., Div. of Market Research & Statistics, Bd. of Governors of the Fed. Reserve Sys.), *available at* http://www.house.gov/financialservices/banking/71900par.htm; H.R. 4541, *The "Commodity Futures Modernization Act of 2000" Before the H. Comm. on Banking and Fin. Servs.*, 106th Cong. (July 17, 2000) (statement of Annette L. Nazareth, Dir., Div. of Market Regulation, SEC), *available at* http://www.house.gov/financialservices/banking/71900naz.htm; H.R. 4541, *The "Commodity Futures Modernization Act of 2000" Before the H. Comm. on Banking and Fin. Servs.*, 106th Cong. (July 19, 2000) (statement of C. Robert Paul, Gen. Counsel, Commodity Futures Trading Commission), *available at* http://www.house.gov/financialservices/banking/71900pau.htm; *see also* President's Working Group on Financial Markets, OVER-THE-COUNTER DERIVATIVES MARKETS AND THE COMMODITY EXCHANGE ACT, (U.S. Dep't of the Treas., Nov. 1999), *available at* http://www.ustreas.gov/ press/releases/reports/otcact.pdf (the Report suggests that permitting removing regulatory impediments to the development of over-the-counter derivatives would lead to reduced systemic risk).

34. *Id.* Not all observers at the time were so sanguine about the ability of sophisticated market participants to fend for themselves without regulatory changes. *See* Stout, *supra* note 30. For a discussion of credit default swaps, see *infra.* Section III.

35. COMMODITY FUTURES MODERNIZATION ACT OF 2000, HR 5660, 106th Cong. (2000). "Sec 105(b) SWAP TRANSACTIONS . . . (g) Excluded Swap Transactions.—No provision of this act . . . shall apply to or govern any agreement,

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With respect to the regulatory stance in both banking and financial derivatives, the movement over the last quarter of the twentieth century has been clear. Regulators understood that private parties were best placed to determine the nature and the limits of the risk they were capable of undertaking. By permitting financial institutions to determine their optimal size and scope, regulators would allow such institutions to innovate, thus enjoying the benefits of risk reduction associated with diversification without the interference of regulators. This was supposed to have the benefit of reducing systemic risk without the interference of regulators while at the same time providing borrowers with better access to capital at cheaper rates. Sophisticated investors were thought to be in the best position to protect themselves when engaging in over-the-counter derivative transactions. By engaging in over-the-counter derivative transactions, parties could improve resilience and lower systemic risk in the financial system.

Notwithstanding these sanguine claims, there were counter arguments available at the time. For example, critics of bank deregulation argued that deregulated banks would be subject to conflicts of interest that might have them put the interests of underwriting clients ahead of the investing public, leading to a collapse of confidence in the bank holding company in the event such conflicts resulted in low quality securities being issued to the investing public. Critics also argued that banks might attempt to extend deposit protection to their securities affiliates, and thus create a moral hazard leading to excessive risk taking by securities subsidiaries of banks.[36] With respect to claims that sophisticated market participants could fend for themselves in derivative markets, the near collapse of LTCM, a hedge fund founded by two Nobel prize winning economists, brought such a claim into question. In the 1999 President's Working Group on Financial Markets' report on the collapse of LTCM, regulators concluded that excessive leverage combined with the use of derivative instruments by a central trading partner, like LTCM, had created systemic risk

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contract, or transaction in a commodity other than an agricultural commodity if the agreement, contract or transaction is—entered into only between persons that are eligible contract participants . . . subject to individual negotiation by the parties; and not executed or traded on a trading facility."

36. *See* Kroszner & Raghuram, *supra* note 29.

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(i.e., risk to the entire financial system).[37] Even the sophisticated investors at the center of LTCM were not able to effectively manage that risk. Notwithstanding the conclusions of the report, six months later, those same regulators recommended that Congress not subject such transactions to any oversight.[38]

B. *Credit*

In the context of the deregulatory environment described above, cheap credit lit the fuse.[39] After the collapse of the stock market bubble in 2000, the Federal Reserve attempted to engineer a "soft landing" by aggressively lowering short term interest rates from 6.5 percent to 3.5 percent.[40] Following the attacks on the World Trade Center in 2001, the Federal Reserve provided yet more stimulus by lowering rates further to 1.75 percent. Finally, in 2003, the Federal Reserve lowered short-term rates to only 1.0 percent and then held them there for a year. In real terms, interest rates during this period were negative.[41] With inflation exceeding interest rates, the Federal Reserve was in effect paying banks to borrow money through 2004.

Ultra low interest rates during this period had the effect of encouraging financial institutions to seek out a new range of potential investment products that might provide a higher return for the same risk profile. Borrowers, who might not otherwise have been in the market to borrow, sought credit from recently unshackled financial institutions. These institutions made relatively cheap credit available, in part, through new

37. *See* President's Working Group on Financial Markets, HEDGE FUNDS, LEVERAGE, AND THE LESSONS OF LONG-TERM CAPITAL MANAGEMENT, (U.S. Dep't of Treasury, Apr. 1999).

38. *Id.*

39. Others have already noted the importance of cheap credit in generating conditions for the recent real estate bubble. *See, e.g.*, CHARLES MORRIS, THE TRILLION DOLLAR MELTDOWN 59-60 (2008).

40. *Id.*; *see also* Jonathan Fuerbringer, *The Markets: Stocks & Bonds; Investors Weed Out Thorns From Greenspan's Message*, N.Y. TIMES, July 21, 2000, at C1, *available at* http://www.nytimes.com/2000/07/21/business/the-markets-stocks-bonds-investors-weed-out-thorns-from-greenspan-s-message.html.

41. According the Bureau of Labor Statistics, the CPI in 2002 and 2003 was 2.3 percent and 2.7 percent respectively. During those years, had a bank borrowed money from the Fed at between 1.00 percent and 1.25 percent, it would have made money in real terms simply by doing nothing.

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and innovative lending schemes.[42] As a consequence, the ratio of household debt to personal disposable income grew rapidly from approximately 90 percent in 1999 to almost 120 percent in 2005.[43]

C. *Housing Bubble*

Accompanying, or perhaps as a result of, both the suppression of interest rates and the development of new financial products, a real estate bubble developed. Despite significant evidence to the contrary, market participants developed the view that real estate prices would not, or could not, decline.[44] The variety of subprime mortgages marketed during the run up to the Financial Crisis of 2008 (including adjustable rate mortgages ("ARM"s), option ARMs, Alt-A stated income loans, negative amortization loans, etc.) were "collateral dependent" loans that depended on the continued appreciation of housing prices for their viability.[45] By 2006, 20 percent of all mortgage originations were subprime loans that followed this model, and 80 percent of those were securitized.[46] Securi-

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42. *See* discussion of collateralized debt obligations and the securitization of lending *infra* Section III.

43. Federal Reserve Bank of San Francisco, *Spendthrift Nation*, FSRB ECONOMIC LETTER (Nov. 10, 2005), *available at* http://www.frbsf.org/ publications/economics/letter/2005/el2005-30.pdf. For a discussion of adverse selection in the mortgage market, see *infra* Section III.

44. Rating agencies exhibited an availability bias by modeling the growth in housing prices and not including the possibility of a nationwide decline in asset prices, noting that such a scenario had not occurred since the Great Depression. Aaron Lucchetti, *As Housing Boomed, Moody's Opened Up*, WALL ST. J., Apr. 11, 2008, at 1, *available at* http://online.wsj.com/article/SB120787287341306591.html. Notwithstanding such optimistic assumptions, there was significant available evidence that real estate markets, even national markets, go down as well as up. Takeo Hoshi & Anil K. Kashyap, *Japan's Financial Crisis and Economic Stagnation*, 18 J. ECON. PERSP. 3 (2004) (describing economic impact of Japan's housing bubble and subsequent collapse of its housing prices); *see also* ROBERT J. SCHILLER, THE SUBPRIME SOLUTION 29-38 (2008) (reviewing past U.S. housing bubbles).

45. Gary B. Gorton, *The Subprime Panic*, NBER WORKING PAPER 14398 (Oct. 2008), at 6, *available at* http://www.nber.org/papers/w14398.pdf (discussing the optionality of subprime lending); *see also infra* note 50.

46. Gorton, *supra* note 45, at 6; *see also* Scott Frame, Andreas Lehnert & Ned Prescott, *A Snapshot of Mortgage Conditions with an Emphasis on Subprime Mortgage Performance* (Federal Reserve Bank of New York, Aug. 27, 2008), *available at* http://federalreserveonline.org/pdf/MF_Knowledge_Snapshot-

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tization structures both fueled the growth of the real estate bubble and were a source of the Financial Crisis once asset price growth slowed.

ARM's for subprime borrowers were a principal means by which many borrowers entered the housing market during the bubble.[47] The key design aspects of these ARM loans are the short-term nature of the initial low rate, the step-up in rates when the mortgage is "reset" at the end of the initial teaser period, and finally, the prepayment penalty.[48] The step-up in rates combined with prepayment penalties effectively creates a valuable option for lenders seeking to provide credit to risky borrowers.[49] The anticipated increase in borrower's equity permits borrowers to roll over the initial loan into a new loan with the loan servicer.[50] Provided housing prices continue to increase, this cycle created an option for the loan servicer. Of course, the downside of this option is that if real estate values do not increase, the servicer can refuse to refinance—effectively forcing the borrower into foreclosure.

082708.pdf (discussing subprime mortgages and growth). For discussion of securitization process, see *infra* at Section III.

47. Frame et al., *supra* note 46 (discussing subprime mortgages and growth).

48. Gorton, *supra* note 45, at 5; Anand K. Bhattacharya, *Prepayment Penalty Mortgage-Backed Securities*, in THE HANDBOOK OF MORTGAGE-BACKED SECURITIES 77-81 (2001) (discussing the structure and incentives of the prepayment penalty).

49. Gorton, *supra* note 45, at 5. If the value of the collateral increases during the initial period, lenders have an incentive to waive prepayment penalties and refinance the borrower's loan. On the other hand, if the value of the collateral goes down or the borrower turns out to be a poor risk, the combination of the step-up of rates and the prepayment penalties can force the borrower into foreclosure and thus limit downside losses for lenders. Bhattacharya discounts this as a motivation for engaging in these kinds of loans. See Bhattacharya *supra* note 48, at 80.

50. Reliance on "collateral dependent" mortgages during the recent housing bubble is in contravention to good banking practices. *See* Fed. Reserve Bd., Div. of Banking Supervision & Regulation, BANK HOLDING COMPANY SUPERVISION MANUAL (Jan. 2007) at § 3070.3.1.2, *available at* http://www.federalreserve.gov/ boarddocs/supmanual/bhc/200901/3000p1.pdf.

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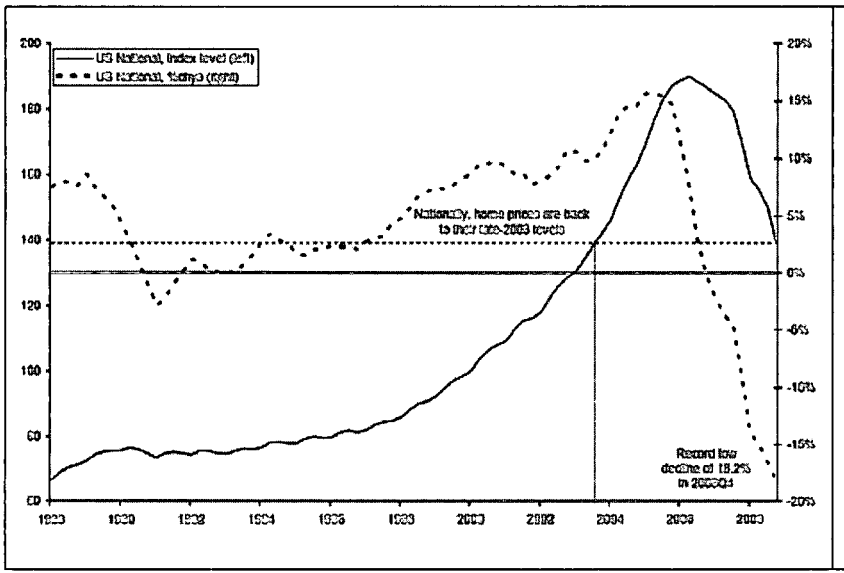

FIGURE 1:[51]
CASE-SCHILLER COMPOSITE INDEX

The Case-Schiller historical index of national home prices highlights the trends in real-estate values since 1988. The rapid growth in real estate values begins in 1998, coincident with the tech stock bubble, and then accelerates in 2001 as the Federal Reserve aggressively lowered interest rates. Prices end their climb in 2006, approximately two years after the Federal Reserve began raising interest rates.

51. Standard & Poor's, *Nationally, Home Price Declines Closed Out 2008 with Record Lows According to the S&P/Case-Schiller Home Prices Index*, Press Release (Feb. 24, 2009), *available at* http://www2.standardandpoors.com/spf/pdf/index/CSHomePrice_Release_022445.pdf.

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During the period following the collapse of the tech bubble, real estate values grew quickly, well above historical averages.[52] Bubble economies often work in unexpected ways. Expectations of future price increases can feed on themselves during a bubble such that it becomes rational—even for an investor who recognizes that asset price values are unsustainable—to participate at least temporarily.[53] However, while the mechanics of building up a bubble are generally understood, what is less easily explained is how market participants convinced themselves that they had entered a "new era" of housing finance.[54] In 2004—even as he was beginning to raise interest rates—Federal Reserve Chairman Alan Greenspan endorsed the subprime housing bubble when, in a speech before the National Credit Union Association, he noted that fixed rate mortgages appeared "unduly expensive" and that consumers "might benefit if lenders provided greater mortgage product alternatives to the traditional fixed rate mortgage."[55]

The subprime securitization structure required stable or a downward trend in interest rates to sustain itself.[56] When the Fed began to raise interest rates in 2004-2005, demand for subprime borrowing cooled, leading to a decline in real estate

52. Schiller, *supra* note 44.

53. PETER GARBER, FAMOUS FIRST BUBBLES 5 (2000) (describing herding and the "rationality" of bubbles).

54. "New Era" claims, even by sophisticated observers, are common during bubble periods. During the period prior to the stock market crash of 1929, the "new era" of stock investing had, according to well-known Yale economist Irving Fisher, led prices to a higher, sustainable plateau. FREDERICK LEWIS ALLEN, ONLY YESTERDAY 245 (John Wiley & Sons, Inc. 1997) (1931).

55. Alan Greenspan, Chairman, Fed. Reserve Bd., *Understanding Household Debt Obligations*, Remarks before the Credit Union Nat. Ass'n 2004 Governmental Affairs Conf., (Feb. 23, 2004), *available at* http://www.federalreserve.gov/boarddocs/speeches/2004/20040223/ (arguing that the insurance borrowers were paying for certainty was too expensive and that individual borrowers could likely more cheaply manage their interest rate risk in other ways while holding an adjustable rate mortgage). Of course, in hindsight, Mr. Greenspan's admission that he did not fully understand the subprime market until sometime in 2005 provides some explanation of his position. *See* Cyrus Sanati, *Greenspan Says He Was Mystified by Subprime Market*, Dealbook, N.Y. TIMES, Feb. 12, 2009, http://dealbook.blogs.nytimes.com/2009/02/12/greenspan-says-he-was-mystified-by-subprime-market/.

56. For a discussion of dynamics of securitization of subprime lending, see *infra* Section III; Gorton, *supra* note 45.

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prices. Declines in real estate prices had the double effect of reducing incentives for servicers to refinance subprime borrowers as the fixed terms of those mortgages reset to variable rates. As marginal borrowers who were now forced to pay higher rates began to default on their mortgages, the air quickly came out of the real estate bubble as subprime borrowers were forced into foreclosure.[57]

III.
SECURITIZATION PROCESS CREATES ADVERSE SELECTION BIAS

Adverse selection can occur when a seller has more information *ex ante* about the underlying quality of its assets than the buyer and where the buyer relies on a heuristic or other "independent marker" in order to make an assessment about the average quality of the assets being offered by the seller.[58] Where that is true, sellers who know that the true value of their assets is greater than that indicated by the independent marker will withhold their assets from the market. On the other hand, sellers who know that the true value of the asset they are offering for sale is less than that indicated by the marker will stay in the market. Consequently, where there is an asymmetry of information with respect to the true value of an asset, the market will be made up of lower than average quality assets.[59] In the extreme, the potential for adverse selection can lead to still-born markets or market crashes. Following the Financial Crisis of 2008, it has become clear that some of financial innovations central to development of capital markets over the past three decades led to the development of a financial lemons market.

Prior to the development of securitization and structured finance techniques, debt financing and risk was highly idiosyncratic. The only way a local banker could manage risk associated with her credit investments was to develop relationships with potential borrowers that elicited private information about the potential of these potential borrowers to repay. Only

57. The introduction of synthetic collateralized debt obligations ("CDO"s) had the effect of multiplying potential losses well beyond the size of the stock of real estate. For a discussion of CDOs and synthetic CDOs, *see infra* Sections III and IV.

58. Akerlof, *supra* note 4.

59. *Id.*

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by generating private information about potential borrowers could a banker adequately manage risk.[60] The commoditization of debt through securitization and structured finance has permitted investors to diversify away idiosyncratic risk. On the other hand, securitization and structured finance have attenuated the once-strong link between borrowers and the ultimate investors, thus creating incentives for originators of financing products to engage in opportunistic behavior, leading to a lemons market.[61]

Securitization, or the commoditization of debt financing, turned the sensibility of old bankers on its head by attenuating the link between borrower and lender.[62] In the securitization mode, private information takes a back seat to heuristics, such as credit scores, which tend to guide underwriting decisions.[63] With the "originate-to-distribute" business model, loan originators have very little interest in developing long-term relationships with potential borrowers.[64] Rather, loan originators make their money in just two ways, both of which can be characterized as one-off transactions. First, they make a commis-

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60. J.P. Morgan summed up this approach to finance when, in response to a question by Samuel Untermeyer during the 1912 Pujo Committee (or Money Trust) Hearings whether commercial credit was allocated based primarily upon profit potential, he answered, "No sir; the first thing is character." JEAN STROUSE, MORGAN: AMERICAN FINANCIER 13 (2000).

61. Economists have recognized this problem for many years. Gary Gorton & G. Pennacchi, *Banks and Loan Sales: Marketing Nonmarketable Assets*, 35 J. MONETARY ECON. 389, 391 (1995), *available at* http://dx.doi.org/10.1016/0304-3932(95)01199-X (noting that loan sales should result in less *ex ante* monitoring); *see also* Bernanke, *supra* note 5 at 142 (noting that financial markets are susceptible to the lemons market problem). Engel and McCoy also note that securitization creates incentives for the development of a lemons market in the subprime mortgage market. *See* Kathleen C. Engel & Patricia A. McCoy, *Turning a Blind Eye: Wall Street Finance of Predatory Lending*, 75 FORDHAM L. REV. 2039, 2072 (2007), *available at* http://law2.fordham.edu/publications/articles/ 500flspub7646.pdf.

62. On the other hand, Hill notes that securitization permits borrowers who might otherwise be "lemons" to overcome the lemons problem. Claire Hill, *Securitization: A Low Cost Sweetener for Lemons*, 74 WASH. U.L.Q. 1061 (1996), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=333022.

63. Credit scores were the "independent marker" required for the development of a financial lemons market. Akerlof, *supra* note 4.

64. *See* Anand K. Bhattaharya, Frank J. Fabozzi, & S. Esther Chang, *Overview of the Mortgage Market*, THE HANDBOOK OF MORTGAGE-BACKED SECURITIES 4-5 (2001) (describing the "originate-to-distribute" model).

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sion on every loan they underwrite.[65] Second, they make a profit on every loan they sell on to sponsors of investment pools for mortgage-backed securities.[66] Originators sell whole loans to these investment pools and typically maintain no ongoing obligation with respect to the performance of such loans.[67] Consequently, originating banks have little incentive to focus on the long-term viability of loans they sell on to investment pools. After selling off a loan, the originating bank is able to use the cash generated by that sale to originate more loans.[68] Thus, in the abstract, the securitization process makes it possible for banks to lend more than under the more traditional lend-and-hold model and can lead to more economic growth.

The residential mortgage backed security ("RMBS") is the traditional securitization vehicle. In an RMBS structure, an investment pool, legally separate from the mortgage originator or sponsor, holds anywhere from 1,000 to 10,000 mortgages. The RMBS structure is designed as a "pass-through" conduit.[69] As a pass-through, the structure simply distributes pro rata all the proceeds it receives periodically from mortgage servicers. The pro rata distribution structure results in a lumpy payment schedule because all mortgage borrowers are holding an im-

65. *Id.*

66. *Id.*

67. For example, originators maintain no ongoing obligation or credit risk beyond a 60-day window with respect to representations and warranties for any loan contributed to one of Goldman Sachs' pools. Should a loan sold to one of these pools default after 61 days, the originator has no obligation to take such a loan back. *See* GSAA Home Equity Trust 2004-6, FORM 424B5 (filed with the SEC on July 29, 2004); GSAA Home Equity Trust 2005-3, FORM 424B5 (filed with the SEC on Feb. 23, 2005); GSAA Home Equity Trust 2006-6, FORM 424B5 (filed with the SEC on May 1, 2006); and GSR Mortgage Loan Trust 2007-5F, FORM 424B5 (filed with the SEC on Dec. 28, 2007).

68. If a bank retains a portion of the credit risk of a loan that is otherwise sold to a securitization pool, bank regulators may not give the selling bank any relief in its regulatory capital requirements. On the other hand, if an originating bank sells its entire interest in the loan and bears none of the credit risk, then it can receive relief from regulatory capital requirements. *See* D. Staehle and C. Cummings *The Supervision of Credit Derivative Activities of Banking Organizations,* in HANDBOOK OF CREDIT DERIVATIVES 293 (J. Francis, J. Frost & J. Whitaker eds., 1999).

69. LAURIE S. GOODMAN & FRANK J. FABOZZI, COLLATERALIZED DEBT OBLIGATIONS 77 (2002) (describing pass-through entities).

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plicit put option on their loans.[70] When interest rates decline, the borrower has an incentive to pre-pay the loan and refinance at a lower interest rate (a "put option"). Pass-through conduits are also subject to seasonality. In summer months, when people tend to move, an RMBS might expect to see a large number of prepayments as borrowers sell their homes and move. For these reasons, the RMBS was never a popular investment vehicle with investors in search of predictable returns.[71]

The collateralized debt obligation ("CDO") was created, in part, to attempt to address the problems of optionality and seasonality in mortgage-backed securities. In its first iteration, the CDO took an RMBS security and simply prioritized, or *tranched*, the payments.[72] In a CDO structure, the proceeds of the CDO pool are not simply passed though pro rata to bond holders. Rather, the CDO sponsor assembles an asset pool that may include individual mortgages or as many as 45 RMBS.[73] The payments from this pool are then prioritized in senior and junior tranches in a process called subordination.[74] By ensuring that senior tranches are paid before any junior tranches are paid, the CDO sponsor assured investors in senior tranches of a steady cash stream from the pool. The most senior tranche is always rated AAA, the highest investment grade rat-

70. This applies only to loans that do not include prepayment penalties.

71. The seasonality and optionality of mortgages is well known. *See* Dale Westhoff & V.S. Srinvasan, *The Next Generation of Prepayment Models to Value Non-Agency MBS* in THE HANDBOOK OF MORTGAGE-BACKED SECURITIES (Frank Fabozzi ed., 2001), at 429-435.

72. Joel W. Brown & William M. Wadden, *Mortgage Credit Analysis* in THE HANDBOOK OF MORTGAGE-BACKED SECURITIES, *supra* note 71, at 315.

73. Goldman Sachs Mortgage Securities Company provides a representative sample of the kinds of CDOs that were generated during the period up through 2007. *See* GSAA Home Equity Trust 2004-6, FORM 424B5 (filed with the SEC on July 29, 2004); GSAA Home Equity Trust 2005-3, FORM 424B5 (filed with the SEC on Feb. 23, 2005); GSAA Home Equity Trust 2006-6, FORM 424B5 (filed with the SEC on May 1, 2006); and GSR Mortgage Loan Trust 2007-5F, FORM 424B5 (filed with the SEC on Dec. 28, 2007); *see also* FRANK FABOZZI, CHUCK RAMSEY & MICHAEL MARZ, THE HANDBOOK OF NONAGENCY MORTGAGE-BACKED SECURITIES 23 (2000).

74. Frank Fabozzi et al., *Nonagency CMOs*, in THE HANDBOOK OF MORTGAGE-BACKED SECURITIES, *supra* note 71, at 269-70 (for a discussion of subordination).

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ing available.[75] Investors in the most junior tranche, the equity tranche, accept the first losses from the pool.[76] The most important aspect of the CDO structure is that through subordination of cash flows, the sponsor is able to produce a security and has a higher credit rating than the average credit rating of the underlying assets in the CDO pool. The waterfall payment structure ensures that less senior bonds suffer the first losses, thus getting around the problems of seasonality, optionality, and credit risk that are typical in a pass-through structure.[77]

75. The most senior tranche in a CDO is always rated AAA. This assumes that the probability of repayment of the assets making up the collateral of the pool is not correlated, such that the likelihood of all, or a significant number of, borrowers defaulting at the same time, is low. Given the structure of payments flowing from the CDO pool, the discussion that occurs among rating agencies and the CDO sponsors is not about whether a senior tranche has an AAA rating, but rather how large or small such a tranche will be. GSAA Home Equity Trust 2006-6, FORM 424B5 (filed with the SEC on May 1, 2006) (example of subordinated payment structure). Senior tranches from the period 2005-2006 could be large. For example, in the GSAA Home Equity Trust 2006-6 CDO 93 percent of the $464.5 million in bonds issued as part of that offering were rated AAA. This offering included more than 2,500 fixed-rate Alt-A mortgage loans with borrower average FICO scores of only 620. GSAA Mortgage Securities Corp, FORM 424B5 (as filed with the SEC on May 1, 2006) at S-34. Although rating agencies and sponsors assumed low default correlations for the assets backing these kinds of CDOs, in hindsight, they appear to have been wrong as the default correlations turned out to be quite high.

76. GSAA Mortgage Securities Corp, FORM 424B5 (filed with the SEC on May 1, 2006).

77. *See* GSAA Home Equity Trust 2004-6, FORM 424B5 (filed with the SEC on July 29, 2004); GSAA Home Equity Trust 2005-3, FORM 424B5 (filed with the SEC on Feb. 23, 2005); GSAA Home Equity Trust 2006-6, FORM 424B5 (filed with the SEC on May 1, 2006); and GSR Mortgage Loan Trust 2007-5F, FORM 424B5 (filed with the SEC on Dec. 28, 2007).

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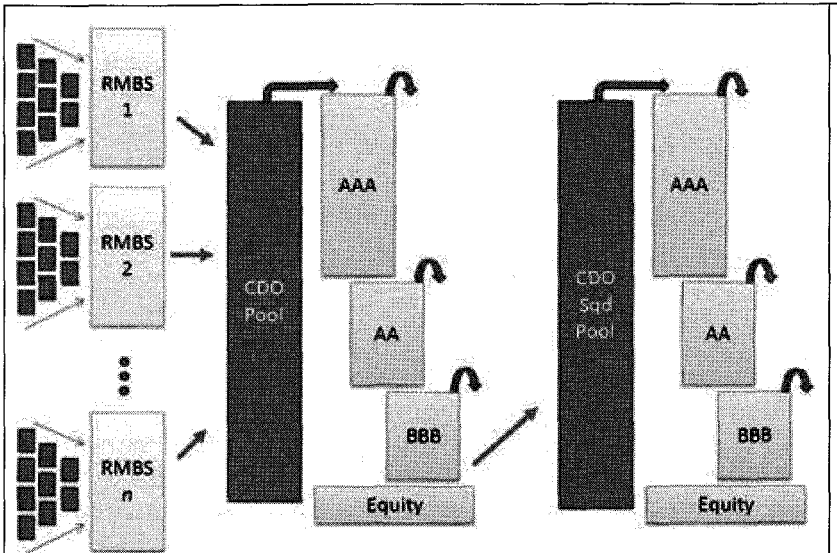

FIGURE 2:[78]
COLLATERALIZED DEBT OBLIGATION
PAYMENT WATERFALL

The collateralized debt obligation relies on financial engineering to generate stable and predictable revenues from less than high quality collateral. By prioritizing payments into the CDO pool, the sponsor of a CDO can ensure that some claims, those rated AAA, have very high likelihoods of repayment. By assembling multiple low-quality pools of obligations from CDOs, sponsors can create a similar waterfall payment structure and thus generate an AAA obligation from a pool of low wuality mortgages—the CDO-Squared. With this waterfall payment structure, so long as the risks of default for the loans comprising the pool are uncorrelated, the risk of repayment for highest rated tranche is extremely low.

78. Goodman & Fabozzi, *supra* note 69, at 95-96 (describing the waterfall payment structure of CDOs).

By prioritizing the payments, the sponsor can transform a pool of the lowest quality loans into a high quality security. For example, the "CDO-Squared" structure can create an AAA security out of an asset pool backed by only BBB bonds through prioritizing payments.[79] In the typical CDO, the high-risk BBB and Equity tranches are the most troublesome. Due to the risk involved in holding such securities, there may be few buyers. In the vernacular of the industry, these tranches are known as the "B-piece" or toxic assets.[80] By assembling blocs of B-piece assets into a new CDO, one can structure cash flows to create an AAA security.[81] This is possible because as long as the default risk of the assets in a pool is not correlated, there will always be cash flow through the entity. Although not all subprime borrowers will be able to repay their loans, some will. The cash flow from those good risks pays the AAA claims. Lower-rated securities in the CDO-Squared structure, of course, must accept more risk.

In the early stages of the real estate bubble, the number of high quality borrowers in the marketplace was relatively high. So long as interest rates remained low or on a downward trajectory and asset values remain inflated, there would be a supply of quality borrowers looking for financing and refinancing. Rising real estate prices and a functional refinancing market for subprime borrowers meant that historically fewer marginal borrowers defaulted on their loans.[82] Consequently, during the run-up in real estate prices, the CDO-Squared structure was an ideal investment: it provided high yields at low levels of risk.

However, when interest rates began to climb in 2005/2006 at the tail-end of the bubble, fewer high quality borrow-

79. Nomura Fixed Income Research, *CDOs-Squared Demystified* (Feb. 4, 2005) (on file with author).

80. Tax rules initially required sponsors of CDOs to retain these toxic assets. However, the creation of real estate mortgage investment conduits ("REMIC") as special purpose vehicles permitted sponsors to dispose of these assets. Initially, there was not a market for these assets. However, the CDO-squared structure changed that. I.R.C. § 860 (2002), *Taxation of REMIC's.* Eric Bruskin, Anthony B. Sanders & David Sykes, *The Nonagency Mortgage Market: Background and Overview,* in THE HANDBOOK OF NONAGENCY MORTGAGE-BACKED SECURITIES, *supra* note 73, at 10.

81. Nomura, *supra* note 79.

82. Bruskin et al., *supra* note 80, at 15 (describing these trends).

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ers entered the marketplace and standards for approving loans to low quality borrowers dropped.[83] Ordinarily, one might expect a lender to recognize a downturn and then withhold underwriting approvals from poor risks when asset prices are likely to decline. However, the front-loaded structure of incentives in the originate-to-distribute model induced originators of mortgages to lower lending standards and continue to underwrite mortgages precisely when they should have been cutting back.

Empirical studies on subprime mortgages suggest that where the originating institutions securitized mortgages those mortgages tended to be more likely to default.[84] Where securi-

83. There is evidence that underwriting standards declined during this period. Notwithstanding the fact that the Federal Reserve Board's Bank Holding Company Supervision guidelines indicate without reservation that certain types of loans (subprime, Alt-A, high loan-to-value loans, piggyback loans, etc.) are demonstrably more risky than 30-year prime loans, rating agencies nevertheless provided CDOs connected to these loans with AAA ratings. In particular, the Federal Reserve warned against banks making "collateral dependent" loans (i.e., loans that depend on an increase in home prices or subsequent refinancing in order to make them viable), but there was an explosion in the underwriting of collateral backed loans (subprime, Alt-A, Interest Only, Option ARM). *See* Christopher Mayer, Karen Pence & Shane M. Sutherland, *The Rise in Mortgage Defaults*, 23 J. ECON. PERSP. 27 (2009). Division of Banking Supervision and Regulation, Federal Reserve Board, BANK HOLDING COMPANY SUPERVISION MANUAL (June 1997) at § 3070.3.1.2 (setting forth mortgage standards); *see also* Aaron Lucchetti & Serena Ng, *How Ratings Firms' Calls Fueled Subprime Mess*, WALL ST. J., Aug. 15, 2007 (noting that S&P concluded that piggyback and other high risk loans did *not* have a high risk of default for purposes of rating CDO products); Consolidated Class Action Complaint, In Re Washington Mutual, Inc. Securities Litigation, (W.D. Wash., Oct. 21, 2008) (No. C08-0387-MJP), at 115, 129 (recounting statement of one former employee of Washington Mutual noting that underwriting standards fell so low that "if you had a pulse, WaMu would give you a loan. . . . When WaMu originated a loan with a low teaser rate, it approved the loan based upon the borrower's ability to repay the loan at the teaser rate rather than the fully indexed rate."). For additional examples of lax underwriting standards, *see* Kristopher Gerardi, Andreas Lehnert, Sahe Sherlund & Paul Willien, *Making Sense of the Subprime Crisis*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY 7-10 (Sept. 2008), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1341853.

84. Benjamin J. Keys, Tanmoy Mukherjee, Amit Seru & Vikram Vig, *Did Securitization Lead to Lax screening? Evidence From Subprime Loans*, at 22 (Apr. 2008) (observing that a doubling of securitization volume is associated with about a 20 percent increase in defaults), *available at* http://papers.ssrn.com/sol3/ papers.cfm?abstract_id=1093137 (forthcoming in Q.J. Econ.).

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tization was common, mortgage originators, for their part, appear to have relied heavily on "hard" information, like FICO scores, rather than expend resources in collecting soft information about a potential borrower's likelihood of default. Others note that "hard" information does not capture important "soft" information about a potential borrower's likelihood to default, such as the possibility of losing a job or upcoming expenses not adequately revealed by expense reports. This is the type of information routinely developed in the pre-securitization era of relationship banking. The process of securitization forces originators to standardize information, thus making it difficult if not impossible to convey soft information to investors.[85] The true quality of these loans is unobservable to investors at the end of the asset stream.[86] The costs of direct investigation of the quality of the assets backing the pool in such cases are prohibitive.

Other empirical studies of bank holding companies following the repeal of the Glass-Steagall Act conclude that banks engaging in "broad banking" were highly diversified in their lending and holding of mortgage-backed assets, but that with such holdings, these banks behaved more like uninformed investors than banks with less diversified lending portfolios.[87] Less diversified banks tended not to securitize mortgages that they originated but generated more private information about their borrowers.[88] The securitization process thus generates

85. Rajan et al. posit that "hard" information, like a FICO score, does not capture important "soft" information about a potential borrower's likelihood to default, like the possibility of losing a job or upcoming expenses not adequately revealed by expense reports. The process of securitization forces originators to standardize information, thus making it difficult to convey soft information to investors. This reduces the incentive for originators to collect such information. Yday Rajan, Amit Seru, & Vikrant Vig, *The Failure of Models That Predict Failure: Distance, Incentives and Defaults*, at 12-13 (Oct. 2008), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1296982.

86. Indeed, prospectuses used to market CDOs to sophisticated investors do not contain more than summary information about the loans in the loan pool. GSAA Home Equity Trust 2004-6, FORM 424B5 (filed with the SEC on July 29, 2004). However, although certain "hard" data is made available to rating agencies prior to the offering. SEC Staff Report, SUMMARY OF EXAMINATION OF SELECTING RATING AGENCIES (July 2008).

87. Elena Loutskina & and Philip E. Strahan, *Informed and Uninformed Investment in Housing: The Downside of Diversification* (Aug. 2008), *available at* ssrn.com.

88. *Id.*

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structural informational asymmetries that result in uninformed lending. These asymmetries may be impossible to eliminate or reduce, and in the face of this complexity, large bank holding companies retreated to heuristics to assist in their decision-making.[89]

The most common heuristic is the credit rating issued by one of a number of Nationally Recognized Statistical Rating Organizations ("NRSRO"). NRSROs, through their use of letter-grade ratings, provide an accessible tool for investors attempting to weigh investment options in different securities. Letter-grade ratings generated by the NRSROs provide potential buyers of bond issues with the "independent marker" necessary for the development of a financial lemons market. These ratings provide potential investors with guidance relating to the relative quality of a bond.[90] Investors relied on these letter-grade ratings to replace their own due diligence with respect to complex financial products.[91] If one understands rat-

89. Kahneman et al., *supra* note 9, at 11; *see also* Engel & McCoy, *supra* note 61, at 2087-90 (also noting a retreat to heuristics by investors). In addition, because many institutional investors pursue diversification strategies, their goal is to ensure that the portfolio they hold is diversified and replicates the performance of some benchmark index over time. Rather than the performance of any individual component, the investor is more concerned with the performance of her portfolio of investments, of which the proposed CDO is only one small component. The implication being that the need to diversify can swamp the incentives to investigate the true value of the underlying assets in any given CDO pool. In pooling unrelated loans investors are able to reduce the idiosyncratic risks associated with the pool. The actual character of any individual borrower in a pool of uncorrelated loans becomes irrelevant. Provided the pool of loans to be securitized is sufficiently diversified, the idiosyncratic risk attached to each borrower becomes less important provided the risks are all uncorrelated. Richard A. Brealey & Stewart C. Myers, PRINCIPLES OF CORPORATE FINANCE 187 (2000).

90. Rating agencies argue that it does much less than this—that it simply provides a statistical probability of default and is not meant to indicate the actual performance of the rated security. For a discussion of the function of rating agencies, *see*, among others, John C. Coffee, GATEKEEPERS ch. 8 (2006) and Frank Partnoy, *Barbarians at the Gatekeepers?: A Proposal for a Modified Strict Liability Regime*, 79 WASH. U. L.Q. 491 (2001).

91. "A lot of institutional investors bought these securities substantially based on their rating, in part, because this market has become so complex." *See* Lucchetti & Ng, *supra* note 83; *see also* John Plender, *Error-Laden Machine*, FIN. TIMES, Mar. 3, 2009, at 8. For additional evidence that investors rely on ratings rather than conduct their own due diligence, one need only examine the offering memorandum of GSAA Home Equity Trust 2006-6. One of the

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ing agencies as playing the role of "reputational intermediary," then one expects that rating agencies will have an incentive to carefully investigate the quality of the underlying assets because incorrect assessments will be costly to rating agencies.[92] A faithful reputational intermediary will be aggressive in seeking out information and will be hesitant to put its valuable reputation and future business prospects at risk for little by way of benefit.[93] Consequently, rating agencies should be expected to provide potential buyers of bond issues with valuable and accurate information regarding the relative likelihood of default.

On the other hand, if one understands rating agencies to be distributors of the "regulatory licenses" required to issue debt, as argued by Professor Frank Partnoy, then it becomes easier to envision how the presence of rating agencies would not reduce information asymmetries for investors with respect to the underlying pool of assets.[94] Many purchasers of bonds and other debt instruments are limited in the type and quality of instruments they may purchase by regulation.[95] To the extent that regulatory bodies generate demand for ratings, while

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prominent risk factors notes that increased use of non-traditional mortgages might have the effect of permitting borrowers who might otherwise not be able to afford their homes to purchase them. In effect, this factor warned that borrowers might be overleveraged and unable to make repayments. GSAA Mortgage Securities Corp, FORM 424B5 (as filed with the SEC on May 1, 2006) at S-34.

92. *See* Claire Hill, *Regulating the Rating Agencies*, 82 WASH. U. L.Q. 43 (2004) (arguing that agencies will have an incentive to investigate the quality of the underlying assets).

93. *Id.*

94. Professor Partnoy is a critic of the reputational view of rating agencies and argues powerfully that the primary function of rating agencies is to provide "regulatory licenses." *See* Frank Partnoy, *The Siskel and Ebert of Financial Markets?: Two Thumbs Down for the Credit Rating Agencies*, 77 WASH. U. L.Q. 620, 681 (1999) and Partnoy *supra* note 90; *see also* Frank Partnoy, *The Paradox of Rating Agencies*, U. of San Diego Law & Econ. Research Paper, No. 20, Oct. 5, 2001, at 1 (arguing that there is evidence that rating agency reports supply little, if any, new information of value).

95. For example, the Commonwealth of Virginia's General Account investment guidelines permit investments of the state's funds in asset-backed securities that are "rated AAA by at least two nationally recognized rating agencies (one of which must be either Moody's Investors Service or Standard & Poor's." *General Account Investment Guidelines*, Department of the Treasury, Commonwealth of Virginia, July 1, 2005 at 4 (on file with author). The Wisconsin State Investment Fund limits its exposure to mortgage-backed securities by reference to size of holdings for each available rating from a national

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limiting the ability of private actors to enter the ratings business, regulatory action creates valuable licenses that empower rating agencies.[96] Where this dynamic dominates, the value of maintaining a reputation is less than the value of the regulatory license, leading to a decline in reputational intermediation function and a decline in the value of information generated by a rating. Such a dynamic is exacerbated when financial sponsors of transactions that the NRSROs are paid to rate are few and are thus able to generate competitive pressures among NRSROs.[97]

With the benefit of hindsight, one can reasonably conclude that the reputational intermediary/regulatory licensing debate has been conclusively decided in favor of regulatory licensing. Notwithstanding the empirically-oriented approach NRSROs took to justify each of their rating decisions, they systematically underestimated the likelihood of default of mortgage-backed securities.[98] Consequently, issuers, safe in the

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rating agency. *State of Wisconsin Investment Board Investment Guidelines* (on file with author) at 2; *see also* Partnoy, *supra* note 94, at 698.

96. Partnoy, *supra* note 94, at 698-701.

97. With respect to corporate bonds and bonds issued in connection with structured finance (*e.g.*, asset backed securities), the dynamic differs in ways that have important incentive effects. There are at least 60,000 different issuers of corporate bonds. The influence that any one corporate issuer has on rating agencies is insignificant. Consequently, with respect to corporate issuers of bonds, there is no reason to believe that rating agencies are unduly influenced by corporate pressure. *See* Coffee, *supra* note 90, at Chapter 8. Structured finance bonds, on the other hand, present a different calculation. With respect to structured finance bonds, there are a relatively small number of underwriters, concentrated among the investment banks, for thousands of issues. The Lehman Brothers investment bank, for example, securitized $146 billion and $133 billion worth of residential mortgage loans in 2006 and 2005, respectively. Lehman Brothers Holdings Inc., Annual Report (Form 10-K), at 65 (Feb. 13, 2007). Combined with competition among raters, the prospect of retaining repeat business from investment banks can cause incentives to skew away from independence and in favor of a regulatory licensing approach; Aaron Lucchetti, *As Housing Boomed, Moody's Opened Up*, WALL ST. J., Apr. 11, 2008, at 1 (describing the changes in incentives as they relate to structured finance products). Staff Report, SEC, SUMMARY REPORT OF ISSUES IDENTIFIED IN THE COMMISSION STAFF'S EXAMINATION OF SELECT CREDIT RATING AGENCIES 25-26 (July 2008) (noting that rating agencies placed business consideration above rating independence in the structured finance segment).

98. There is some discussion that the models relied upon by the rating agencies were limited in that they did not include previous periods of signifi-

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knowledge that they would receive an AAA rating for their structured finance products, permitted pools to become infected with low quality assets that were not entirely reflected in the rating observed by buyers, thus generating a financial lemons market. The failure of the NRSROs to act as faithful reputational intermediaries permitted their ratings to act as independent markers in the development of a financial lemons market.

While ratings are ubiquitous in debt markets, they also played a central role in the development of the default swaps for CDOs. Securitization vehicles with pools of government agency guaranteed loans receive the highest rating possible on the understanding that U.S. government backing ensures these bonds will not be permitted to default.[99] In order for securitization pools made up of nonconforming and subprime loans to be marketable to a large number of potential buyers, they also require an investment grade rating (consistent with the regulatory license view of rating agency function). Vehicles with non-agency pools can secure an investment grade rating only by providing credit enhancement. Credit enhancement can be accomplished internally, through subordination and overcollateralization.[100] Alternatively, sponsors can rely on external credit enhancement through reliance on credit default swaps sold by insurance companies, like American International Group, Ambac Financial Group, Inc., and MBIA Inc. among others.[101] In a transaction relying on external credit enhancement, the party writing the default swap in effect is

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cant declines in housing prices. Rajan et al., *supra* note 85, at 12-13. Rating agencies were complicit in this breakdown. For example, by granting AAA ratings to CDOs backed by "collateral dependent" mortgages, the rating agencies were making bets that the value of real estate would not decline during the period of the CDOs life. *See* Lucchetti & Ng, *supra* note 83. It appears that that NRSROs fell victim to an availability bias when they neglected to model potential declines in real estate asset values.

99. Goodman & Fabozzi, *supra* note 69, at 75.

100. Overcollateralization requires the sponsor of the CDO to commit more assets to the securitization pool than there are liabilities. Provided the underlying assets are sufficiently diversified and their default risk is not correlated, overcollateralization can be an effective strategy. On the other hand, if defaults across the asset class are correlated, which they turned out to be in recent years, then overcollateralization is less likely to be sufficient to protect against default. *Id.* at 87.

101. For a discussion of credit default swaps, see *infra* Section IV.

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lending out its investment grade rating to the issuer of the bonds or the purchaser of the security.[102] Consequently, the key determinant of the creditworthiness of the bond issue becomes the quantity and quality of the credit enhancement and not the collateral backing the bonds. In the extreme case, the presence of external credit enhancement (like a government agency guarantee or a default swap written by an AAA rated insurance company) can become a proxy for a rating agency's due diligence. With the availability of diligence proxies, the impetus on NRSRO to be rigorous in their assessment of risks related to the CDO issues declines consistent with the regulatory licensing interpretation.

The combination of factors described above led to the development of a financial lemons market. The originate-to-distribute model attenuated incentives for mortgage originators to look beyond a 90-day performance window for borrowers. The inability, due to complexity and opaqueness of the CDO vehicle made it difficult for potential investors to know the true value of the underlying assets backing the CDO. Independent markers (ratings) provided by the NRSRO failed to reflect the true value of the underlying assets. Together, these factors induced adverse selection and the creation of a lemons market for mortgage-backed securities.[103]

The rapid rise in defaults and the relatively poor performance of securitized loans during this period is evidence of the development of the lemons market.[104] The number of sub-

102. Although a sponsor may not always rely on a credit default swap, a bond purchaser may nevertheless purchase a default swap contract and in that way engage in a form of regulatory private ordering. European banks purchased default swaps from AIG in order to gain access to the higher yields associated with riskier investments while still meeting their regulatory obligations to invest in only relatively safe vehicles. *See* discussion of AIG's sales of default swaps *infra* Section IV.

103. This result was predictable. *See* Leland & Pyle *supra* note 4, at 371.

104. Ambac Financial conducted a survey of 1,486 loans in a CDO sponsored by Bear Stearns and found that 89 percent of them breached one more of the representations related to adequacy of borrower income, employment, assets, and intention to occupy the purchased home. *See* Complaint, Ambac Assurance Corporation v. EMC Mortgage Corporation, 2009 WL 734073 (S.D.N.Y. 2009) (No. 08 Civ. 9464). It is worth noting that Ambac did this investigation *ex post* and not *ex ante,* raising the question why Ambac agreed to sell default swaps against collateral that it had not fully investigated. *Id.*

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prime and stated income (Alt-A) loans grew rapidly during the first half of this decade. In 2003, 1.1 million subprime and 304,000 Alt-A loans were originated in 2003. By 2005, those numbers rose to 1.9 million and 1.1 million, respectively.[105] Many of these loans were securitized. According to the Federal Reserve Board, as of September 2008, the percentage of subprime mortgages in trouble or already in foreclosure was well above 30 percent in most states.[106] Others observe that by the third quarter of 2008, the percentage of seriously delinquent loans surged to 5.2 percent.[107] TransUnion estimates that in 2009, more than 7 percent of all mortgages will be in trouble (> 60 days past due).[108] This is the highest rate that TransUnion has ever recorded suggesting that the quality of the overall mortgage pool is low.[109] Although the CDO structure was intended to be resistant to risk of default, the poor quality of the underlying collateral is, in fact, so low that according to one estimate, 47 percent of all CDO's originated since 2002 have experienced a default event.[110] Another study of CDOs from 2005 to 2007 notes that of the $450 billion originated during that period 68 percent are in default.[111] The average recovery rate for AAA CDOs that have been liquidated from this period is reportedly only 5 percent.[112] Atnje Nerndt and Anurag Gupta note that securitized loans are 8-14 percent

105. Christopher Mayer, Karen Pence & Shane M. Sutherland, *The Rise in Mortgage Defaults*, 23 J. ECON. PERSP. 27, 28 (2009).

106. In Florida and California the percentage of subprime mortgages in trouble (more than 30 days behind) or in foreclosure was 47.2 percent and 36.9 percent, respectively, by September 2008. Fed. Res. Bank of N.Y., State-Level Subprime Loan Characteristics (Sept. 2008), *available at* http://newyorkfed.org/regional/subprime.html (follow "Subprime" hyperlink). With respect to Alt-A mortgages in Florida and California the percentage of mortgages in trouble or already in foreclosure was only 28.6 percent and 20.2 percent respectively. Fed. Res. Bank of N.Y., State-Level Alt-A Loan Characteristics (Sept. 2008) (follow "Alt-A" hyperlink). The lower problem rates for Alt-A loans is likely a fact that fewer of them had yet to reset at higher rates as of Sept. 2008. *Id.*

107. Mayer et al., *supra* note 105, at 27.

108. Jane J. Kim, *Delinquent Mortgages Set to Nearly Double in 2009*, WALL ST. J., Dec. 2, 2008, at B11.

109. *Id.*

110. Paul J. Davies, *Half of All CDOs of ABS Failed*, FIN. TIMES, Feb. 10, 2009.

111. Jillian Tett, *Insight: Time to Expose Those CDOs*, FIN. TIMES, Feb. 27, 2009 at 22.

112. *Id.*

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more likely to underperform than loans held by banks, suggesting that originating banks sell off low quality loans and keep high quality loans.[113]

Although the underlying quality of loans in the securitized pools declined during the first half of this decade, the independent marker relied on by investors (the letter-grade rating of structure finance bonds issued against this collateral) failed to convey useful forward-looking information about the true quality of the loans in the CDO pool.[114] Over reliance on this marker made it possible for a lemons market to develop in the market for securitizations.

IV.
OPAQUE DEFAULT SWAP MARKET CREATES MORAL HAZARD

Moral hazard is present when a seller's post-contracting actions are difficult or expensive for a buyer to monitor and where payoffs to the seller and the buyer are not symmetrical. In such situations, a seller may acquire additional benefits by undertaking ex post risky behaviors. In the event the risky behavior pays off, the seller retains all of the benefits. In the event the risky behavior results in a loss, the buyer is forced to bear the losses.[115] Like adverse selection, the potential for moral hazard suggests that self-interested, rational actors will withhold participation from markets where there is a real possibility for counterparties to engage in opportunism. Notwithstanding that possible outcome, we find many examples of markets where moral hazard is present. The market for credit default swaps, exempted from regulation by the 2000 CFMA, is one such market.

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113. Atnje Nerndt & Anurag Gupta, *Moral Hazard and Adverse Selection in the Originate-to-Distribute Model of Bank Credit*, (Oct. 24, 2008), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1290312.

114. Because the ratings provided by rating agencies are probabilistic projections of default probabilities, they tend to lag and not provide much actionable, forward-looking information. For example, of the reported 16,587 credit rating downgrades in 2008, 92.9 percent of them were downgrades of structured finance vehicles. Davies, *supra* note 110. Many of these vehicles had already suffered default events prior to being downgraded.

115. Oliver E. Williamson, *The Vertical Integration of Production: Market Failure Considerations*, 61 AM. ECON. REV. 112, 117-18 (1971).

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The credit default swap is the basic building block of for most credit derivatives.[116] In essence, the default swap is an insurance contract.[117] The default swap transfers the risk of default of a reference entity (for example, a BBB CDO bond) from one party to another. The buyer of the default swap makes periodic payments to the seller of the contract. In the event of a default by the reference entity bond, the seller of the swap is obliged to stand in the shoes of the reference entity and make payment of the notional principal to the buyer of the swap.[118] Buyers of bonds can buy insurance policies that effectively provide the same level of protection. However, the difference between a default swap and an insurance policy is that a default swap does not require that the buyer have an insurable interest. The lack of an insurable interest requirement is what permits the financial industry to use the default swap as a building block on top of which they can build other derivative products.[119]

116. For descriptions of credit default swaps, among others, *see* LEHMAN BROTHERS, GUIDE TO EXOTIC CREDIT DERIVATIVES, 4 (2003), *available at* http://www.investinginbonds.com/assets/files/LehmanExoticCredDerivs.pdf; JOHN C. HULL, OPTIONS, FUTURES, AND OTHER DERIVATIVES, 507-08 (6th ed. 2006); Goodman & Fabozzi, *supra* note 69, at 198-99; Gregory Duffee & Chunsheng Zhou, *Credit Derivatives in Banking: Useful Tools for Managing Risk?*, 48 J. MONETARY ECON. 25, 29-30 (2001).

117. A default swap is not an insurance contract, however. Most importantly, it differs from an insurance contract in that it does not require the protection buyer to have an "insurable interest" in the reference entity. Robert F. Schwartz, *Risk Distribution in the Capital Markets: Credit Default Swaps, Insurance and a Theory of Demarcation*, 12 FORDHAM J. CORP & FIN. L. 167, 173 (2007) (arguing that default swaps are not insurance contracts).

118. J.P. MORGAN, THE J.P. MORGAN GUIDE TO CREDIT DERIVATIVES; *see also* Lehman Brothers, GUIDE TO EXOTIC CREDIT DERIVATIVES, *available at* http://www.investinginbonds.com/assets/files/Intro_to_Credit_Derivatives.pdf.

119. *See* discussion of synthetic derivatives, *infra* pp. 587-88.

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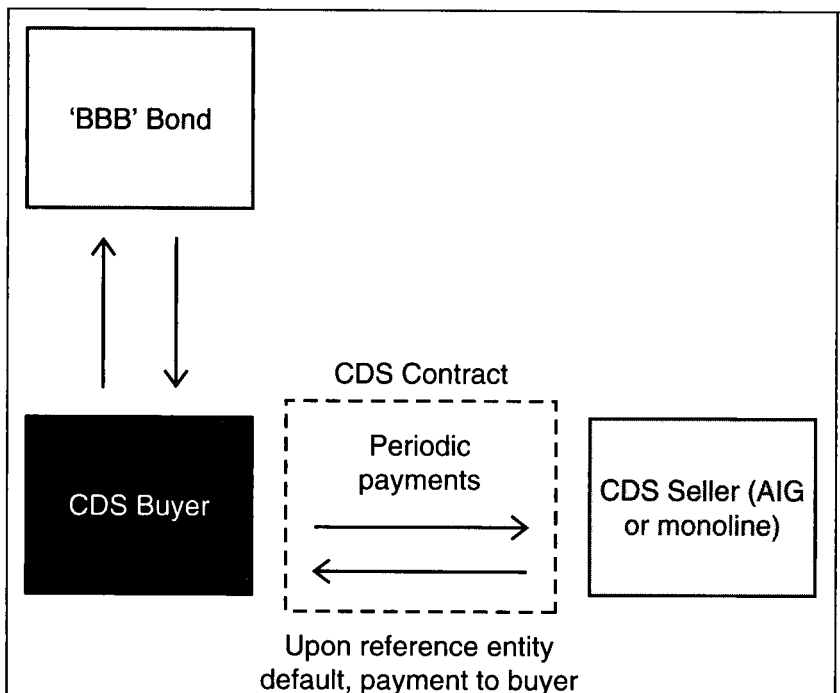

FIGURE 3:[120]
CREDIT DEFAULT SWAP

A default swap is a contract that permits the buyer of the contract to shift the potential losses by the default of a "reference entity," in this case a BBB-rated bond, to the seller of the default swap. In that way, the buyer is able to effectively assign the credit rating of the seller of the default swap to the reference entity.

120. *See also* LEHMAN BROTHERS, *supra* note 116, at 4-5.

The cost of a default swap is driven by two different sets of risks. First, is the probability of the reference entity actually defaulting on its obligations. The cost of purchasing a default swap for a reference entity can rise or fall depending on the entity's perceived risk of default by market participants. As the likelihood of default increases, the price to purchase a default swap increases. Unlike a rating from an NRSRO, the CDS provides buyers with a market-based, forward looking measure of default risk.[121] However, to the extent these swaps are traded over-the-counter and not part of an organized exchange, the information value of such swaps is diminished.

The second component of default swap pricing is counterparty risk, or the risk that the party selling the default protection will itself be unable to make payment in the event of a default by the reference entity. The risk of counterparty default can be mitigated, however, by requiring sellers of default swaps to post collateral, thus permitting even sellers with less than AAA ratings to sell swaps.[122] Because it signals the low probability of a counterparty default, the credit rating of the seller of the default swap has market value. Default swap sellers with AAA ratings are, in effect, able to engage in regulatory arbitrage by selling default swaps for relatively low-rated bonds.[123] Due to the high degree of confidence that market participants placed on the value of an AAA rating, firms, like AIG, that sold default swaps and maintained AAA ratings were not required to post collateral. Consequently, the letter-grade rating became the only security against counterparty risk.

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121. Rating agencies have been criticized for being be backward looking, often subjecting bonds they rate to downgrades only *after* bad news has become obvious to the marketplace. This limits the forward-looking, predictive role that many investors might rely on agencies to provide. Lucchetti & Ng, *supra* note 83; *see also* Partnoy, *supra* note 94, at 659.

122. Sellers with AAA ratings, like AIG and the monoline insurers, were not be required to put up much, if any, collateral to back their trades. *See* discussion of moral hazard with respect to CDS market below.

123. Joe Nocera, *Propping Up a House of Cards*, N.Y. TIMES, Feb. 28, 2009, at B1 (noting the importance of regulatory arbitrage in AIG's default swap business).

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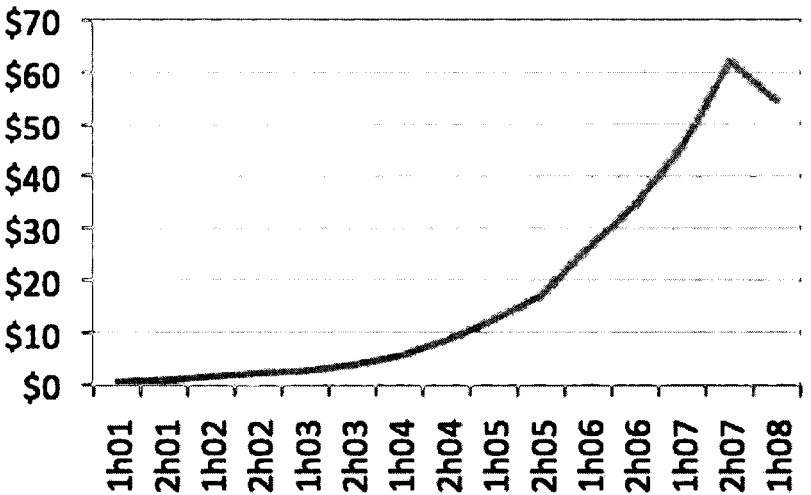

FIGURE 4:[124]
DEVELOPMENT OF CREDIT DEFAULT SWAP MARKET

Following the exemption of credit default swaps from regulatory oversight, the legal certainty provided by this action helped propel the rapid development of the market for such swaps. By end of 2007, the notional value of the total market for default swaps reached $60 trillion. According to some, an estimated two-thirds of the total notional value of outstanding default swaps are swaps in which neither the buyer nor the seller has an interest in the reference entity.

124. ISDA Market Survey, http://www.isda.org/statistics/historical.html.

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The default swap makes it possible to provide an additional layer of credit enhancement to a CDO. Although subordination and overcollateralization were the primary means of credit enhancement in CDO structures, a sponsor of a CDO can improve the credit worthiness of a CDO by buying a default swap to insure against the possibility that the CDO might default. In doing so, it becomes possible for a security that might not otherwise be able to attain an AAA credit rating to, in effect, hire the balance sheet of an AAA rated CDS seller and thus piggy-back on the seller's rating. For example, of the $527 billion in default swaps sold by AIG, approximately $379 billion were not sold as economic hedges, but as vehicles to permit European banks to seek relief from regulatory capital requirements.[125] The presence of a default swap sold by AAA-rated AIG to a European bank meant that the bank could carry the speculative investment in a CDO on its books as a "safe" AAA-rated security and thus remain in compliance with the capital requirements of European banking regulators while enjoying a speculative return on investments in a rising U.S. real estate market.[126]

The default swap can also be a vehicle for market participants to create new financial products known as synthetic derivatives. This is possible because, unlike a traditional insurance contract, neither the buyer nor the seller of a default swap is required to have an "insurable interest" in the reference entity.[127] A synthetic CDO, for example, can be created by assembling a series of default swaps designed to replicate the performance of a CDO reference entity.[128] Since a potentially unlimited number of synthetic CDOs can be created by

125. By selling default swaps AIG provided a regulatory license to European banks to engage in speculative investments in U.S. credit markets. Am. Int'l Group, Annual Report (Form 10-K), at 164 (Feb. 28, 2008). AIG was by no means alone in engaging in this kind of regulatory arbitrage. CalPERS also generated income by lending out its AAA rating to municipal bond issuers in exchange for fees. *See* CalPERS Credit Enhancement Facility, *available at* http://www.calpers.ca.gov/index.jsp?bc=/about/press/pr-2005/jan/gets-aaa.xml (last visited Nov. 1, 2008).

126. Am. Int'l Group, *supra* note 125, at 164.

127. Schwartz, *supra* note 117, at 174 (discussing the lack of insurable interest requirement for default swaps).

128. Nomura Fixed Income Research, *supra* note 79; *see also* Goodman & Fabozzi, *supra* note 69, at 201-203; *see also* Lehman Brothers, *supra* note 116, at 12.

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replicating the performance of a single reference entity, the synthetic CDO permits market participants to create a potentially infinite amount of leverage off a single reference CDO.[129]

Moral hazard played out in the default swap market in the following manner. First, some sellers of default swaps relied on their own high credit ratings to avoid making deposits of collateral on default swaps that they sold.[130] Second, insurance companies that entered the default swap market were almost exclusively sellers of default swaps. Essentially, they made a series of one-way bets that real estate prices backing CDOs would not decline over the course of the swap contracts.[131] In hindsight, these turned out to be imprudent bets. Third, the opacity of the over-the-counter markets for default swaps made it impossible for a buyer of a default swap to adequately determine the overall level of counterparty risk undertaken by a seller. Consequently, sellers of default swaps, like AIG, were able to undertake much more risk than optimal. Finally, buyers of default swaps were able to use the swaps in order to accept more risk than otherwise permitted.

Some large sellers of default swaps relying on their own high credit ratings were able to avoid making deposits of col-

129. To create a synthetic CDO, a financial institution sponsors another entity that sells a series of default swaps against a reference entity. These swaps receive periodic premiums that mimic periodic payments of the reference entity to its investors. These payments are distributed to investors using the same waterfall payment structure of a CDO ensuring that AAA rated tranches are repaid first and that the equity, or B-piece, takes the first loss in the event of a bond default. One reason why the Financial Crisis of 2008 morphed from an isolated real estate decline to a more general decline was the presence of synthetic CDOs acting as a multiplier transmitting poor performance in the real estate sector across through a large number of holders of synthetic positions.

130. Ambac Fin. Group, Annual Report (Form 10-K), at 56 (Mar. 1, 2007) (noting that was not required to supply any collateral for its credit derivatives or total return swaps); *see also* Jonathan R. Laing, *Defusing the CDS Bomb*, BARRON'S, Nov. 17, 2008, at 44 (noting that because of its AAA rating, AIG was not required to post collateral on any of its CDS sales).

131. AIG, *supra* note 125, at 162 (noting that in most cases AIG's Financial Products Group did not hedge any of its positions with respect to default swaps it sold.) According to data from the FDIC, while banks were also very activity in the CDS market, they are both buyers and sellers of these instruments. The monoline insurance companies, on the other hand, were almost exclusively sellers of protection.

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lateral on any swaps they wrote. Collateral plays an important private ordering role in these transactions. Collateral acts as a hostage in the sense that when a seller of a default swap puts up collateral, she credibly signals to the buyer of the swap that she will make good on the contract in the event a default triggers payment.[132] In absence of collateral, counterparties must rely on other credible signals that indicate likelihood of compliance with contractual promises. The letter-grade rating issued by rating agencies, which provides indications of the likelihood of default on debt issues, was such a proxy. Insurance companies with AAA ratings, the highest investment grade rating, indicating a low likelihood of default, were able to sell default swaps and third parties, relying on the high quality of the credit rating did not require collateral.

While ratings are an important heuristic for potential investors, they are both a lagging indicator and subject to inherent conflicts of interest. Consequently, they lack the ability to constrain moral hazard by sellers of default swaps in the same way that, for example, collateral deposits might. Had sellers been required to maintain sufficient collateral to back their commitments, then their balance sheet would have limited the amount of risk they would have been capable of taking on. For example, if a seller or a default swap were required to put up as collateral equal to 10 percent of the notional value of a swap (in cash or Treasuries), the seller's balance sheet would limit the total value of swaps that might be sold and thus limit moral hazard on the part of sellers of default swaps.[133] On the other hand, since ratings are "sticky" and do not change to catch up quickly with issuer behavior, a firm can use its rating opportunistically, selling more swaps than is prudent for a given rating.

In addition, the opaque nature of the over-the-counter swap market makes it impossible for even AAA-rated sellers to credibly signal the true extent of their commitments and their risk exposure to counterparties. Part of this opacity is by design. For example, the lack of information with respect to any

132. Oliver E. Williamson, *Credible Commitments: Using Hostages to Support Exchange*, 73 AM. ECON. REV. 519 (1983).

133. Without a capital constraint in the form of a collateral call, the number and amount of default swaps that might be sold by any one market participant is almost limitless.

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counterparty's swap commitments made the default swap instrument a useful way of hedging counterparty risk without damaging long-term relationships, and thus, it was useful for counterparties to enter these "dark markets."[134] On the other hand, the lack of information with respect to the nature and quality of a seller's risk exposure makes it difficult to constrain opportunistic behavior by sellers of default swaps who are willing to take on an excessive risk.

During the period of the real estate bubble, AIG and other insurance companies began to write default swaps against CDO's in large numbers. Unlike banks that both bought and sold default swaps, leaving their net position generally not far out of balance, insurance companies participated in the over-the-counter credit default swap market exclusively as sellers.[135] In hindsight, these insurers were able to arbitrage the value of their ratings and accept much more risk with respect to these assets than was optimal. For example, during the mid-1990s, Ambac Financial Group, an insurance company, began to rapidly develop its business of providing credit enhancement to asset backed securities like CDOs. In 1996, Ambac had guarantees in place for only $8 million of asset-backed securities.[136] By 2007, the amount of the guarantees in place rose to over $170 million. Because buyers of the swaps relied on Ambac's AAA rating to guarantee payment, Ambac was not required to post collateral against any of these swaps.[137] AIG was an extreme example of moral hazard playing out. By 2007, AIG had sold more than $500 billion of default swaps against CDO's.[138] In essence, AIG made a $500 bil-

134. The default swap was marketed by the investment banks as a confidential way of hedging exposure in the marketplace. J.P. MORGAN GUIDE TO CREDIT DERIVATIVES (published by Riskmetrics, 1999).

135. Bank data from *FDIC Information Center*, www.fdic.gov.

136. Prior to its entry into the CDS market, Ambac was a monoline insurer, providing insurance policies against defaults of municipal bonds. Ambac Fin Group, Annual Report (Form 10-K), at 12 (Mar. 31, 1997).

137. Ambac Fin. Group, Annual Report (Form 10-K), at 77 (Feb. 29, 2008). MBIA, another monoline insurer, engaged in the sale of default swaps for structured finance products on similar terms as Ambac. MBIA wrote some $300 million of default swaps during that same period. MBIA, Inc., Annual Report (Form 10-K), at 57 (Feb. 29, 2008).

138. AIG, *supra* note 125, at 164.

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lion dollar bet that the U.S. real estate bubble would not collapse.[139] That turned out to be a mistake.

Insurance companies with AAA ratings were, for all intents and purposes, unconstrained in their ability to write default swaps and take on risk. The prospect of generating a steady stream of income without the requirement of putting collateral at risk translates into a strong incentive for sellers of default swaps to over-leverage.[140] These insurance companies engaged in a series of one-way bets on the performance of the real estate assets that backed the CDOs they were insuring.[141] Without the benefit of a hedge of these transactions through netting (exposure of a sale being offset through exposure in a purchase) or collateral deposits, the insurance companies participating in the default swap markets were able to, and did, take on much more risk than was prudent.[142]

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139. At the same time, AIG had only $129 billion in total invested assets across the entire firm that it might be able to liquidate to the potential liability in the event its $500 billion bet on real estate went bad. AIG, *supra* note 125, at 101.

140. Carrick Mollenkamp, Serena Ng, Liam Leven & Randall Smith, *Behind AIG's Fall, Risk Models Failed to Pass Real-World Test*, WALL ST. J., Oct. 31, 2008 at A1 (noting that firms like AIG did not believe the risk of default with respect to the underlying real estate to be high).

141. AIG *supra* note 125, at 33 (noting that more than $300 billion in default swaps were sold to European financial institutions seeking relief from regulatory capital requirements). While Ambac and other monoline insurers do not disclose whether they hedged any of the CDSs they sold as credit enhancement, they describe themselves as being in the business of selling (and not buying) such derivatives, suggesting that they may not have hedged their positions. This would be unusual. Following 2000, commercial and savings banks almost tripled their exposure to derivative trades. It is true however that although most banks were net buyers of protection their net positions were not excessive. FEDERAL DEPOSIT INSURANCE CORP., BANK DATA & STATISTICS, http://www.fdic.gov/bank/statistical/index.html. Unlike AIG and the monoline insurers, Lehman Brothers took positions on both sides in the default swap market. Consequently, following Lehman's collapse, sell-side and buy-side default swaps could be netted out, thus reducing the total exposure of counterparties. Such netting was not possible with AIG. Lehman Brothers Holdings Inc., Annual Report (Form 10-K), at 91 (Feb. 13, 2007) (noting that its net exposure was approximately $15 billion).

142. For its part, AIG substantially underestimated the likelihood that it would ever have to make payment on any of these contracts. The former head of AIG's Financial Products division commented about the likelihood of losses stemming from its CDS business on an investor call saying, "[i]t is hard for us, without being flippant, to even see a scenario within any kind of realm or reason that would see us losing $1 in any of those [CDS] transac-

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Finally, European financial institutions in particular were able to accept much more risk that was prudent under the regulatory requirements thanks to the presence of default swap instruments. The approximately $300 billion of default swaps sold to European investors in effect permitted them to enjoy higher yield returns for what they, in effect, were able to declare to regulators as AAA investments. The presence of default swaps permitted institutional buyers to accept higher than optimal levels of risk exposure to U.S. real estate markets while under estimating for the benefit of regulators their potential loss exposure.

V.
SHOCKS AND LINKAGES

The Financial Crisis of 2008 revealed a lesson that has been taught before: Excess leverage can generate systemic risk. While the presence of leverage through the use of CDOs and default swaps can increase returns, it also increases linkages in the system and degrades the robustness of diversification as a risk management tool.[143] Leverage can be the source for transmission of credit distress from a borrower to a lender and then throughout the financial system. Where the transmission is widespread, credit distress can quickly transform itself into panic as counterparties seek to rapidly unwind positions and exit the credit markets in search of liquidity in response to an exogenous shock.[144] In that sense, leverage is a financial accelerator in times of distress.

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tions." *See* David Voreacos & Elliot Bair Smith, *Cassano's Statements on AIG Probed by Prosecutors, People Say*, BLOOMBERG.COM, *available at* www.bloomberg.com/apps/news?pid=20601103&sid=a6m_BOe9Ftk4&refer=news.

143. President's Working Group on Financial Markets, *Report on Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management*, Apr. 1999 (U.S. Dep't. of the Treasury). *See also* ROGER LOWENSTEIN, WHEN GENIUS FAILED 42 (2000) (discussing leverage and the effects of leverage in linking disparate participants in the financial system).

144. "A financial crisis is fueled by fears that means of payment will be unobtainable at any price and, in a fractional reserve banking system it is during these periods of unwinding that institutions are at risk of transmission of panic from one actor to another through their interconnected financial transactions. . . . This transmission is also known as 'systemic risk' or the transmission of a party's 'economic distress' to a counterparty." Jean-Charles Rochet & Jean Tirole, *Interbank Lending and Systemic Risk*, 28 J. MONEY, CREDIT & BANKING 733, 733 (Nov. 1996). Deleveraging exercises were at the

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The situation described above was worsened by the use synthetic derivatives.[145] Because of the opacity in the over-the-counter market for default swaps and the replicative nature of the synthetic derivative it becomes impossible to know, and thus, constrain through private ordering, the true extent of counterparty risk.[146] Synthetic derivatives permitted market participants to generate potentially infinite levels of leverage. The additional leverage from synthetic derivatives created deeper and unexpected interconnections among participants and thus accelerated distress throughout the system.

Two additional lessons from the Financial Crisis of 2008 are already clear. First, the additional stability that was supposed to result from deregulation of the financial system following the repeal of Glass-Steagall is not apparent. In fact, consolidation and the structural changes in the financial industry, including permitting bank holding companies to engage in unlimited underwriting and dealing in securities, may have resulted in more concentrated risks and stronger linkages among financial institutions. Increased concentration leads to an amplification of shocks, rather than a dissipation of them. Although deregulation of the banking system was supposed to result in a more robust financial system, increased exposure to risk through bank holding company exposure to asset-backed securities may have left the financial system *more* fragile.[147] Relying on third parties to originate mortgages created a lemons market for asset-backed securities to the degree that bank

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heart of the Crash of 1929 and LTCM's collapse. An exogenous shock leads to lowering of the value of collateral put up to finance the purchase of securities, the forced sale of those assets drives prices down further, causing additional liquidations. *See* Bagehot, *supra* note 5 and Lowenstein *supra* note 143, at 143.

145. Partnoy & Skeel make a similar argument that credit derivatives create a risk of systemic failure. Partnoy & Skeel are that they do so in part because they reduce lenders' incentives to monitor borrower behavior and thus fuel credit expansion. *See* Frank Partnoy & David A. Skeel, *Credit Derivatives: Promise and Peril of Credit Derivatives*, 75 U. CIN. L. REV. 1019 (2007).

146. Jane Baird, *Synthetic CDO Default Losses Likely to Multiply*, THE GUARDIAN, Nov. 21, 2008, *available at* guardian.co.uk (noting the difficulty in determining the size of CDS liabilities).

147. President's Working Group on Financial Markets *Report on Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management*, Apr. 1999 (U.S. Dep't of Treasury), at 20.

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holding companies were left holding riskier securities as the true value of those assets became known.

Second, during the Financial Crisis of 2008, financial firms, such as Bears Stearns, Lehman Brothers and AIG, became too dependent on the repurchase market ("repo" market) for financing operations.[148] Dependence on this short-term commercial paper market for financing appears to have been a classic short-long fallacy (borrowing short to invest long) with the consequence that firms reliant on the repo market were highly leveraged and not able to withstand significant stresses when the values of assets used as collateral (illiquid CDO's) collapsed.[149]

At the tail end of the real estate bubble three things happened that, when combined, served to quickly let the air out of the financial bubble that had accompanied the run up in real estate prices. First, private parties introduced a market index that tracked the value of default swaps written against a basket of CDOs. Second, changes in accounting rules in 2006 required holders of non-liquid bonds to use this index in order to determine the fair value of such bonds. Third, as the new index declined, holders of non-liquid CDOs were required to write down the value of those bonds, which resulted in these holders having to meet collateral calls in the short term debt markets.[150]

Although the housing bubble had already begun to cool, the addition of information to the marketplace in the form of the ABX derivative index was the impetus for the Financial Crisis of 2008.[151] The introduction of the ABX provided

148. Carrick Mollenkamp et al., *Lehman's Demise Triggered Cash Crunch Around Globe*, WALL ST. J., Sept. 29, 2008; Tobias Adrian & Hyun Song Shin, *Liquidity and Leverage*, FED. RES. BANK STAFF REPORT, NO. 328 (May 2008); *see also* Office of the Inspector Gen., SEC, *SEC's Oversight of Bear Stearns and Related Entities*, Report No. 446-A (Sept. 25, 2008).

149. Adrian & Shin, *supra* note 148 (noting that investment banks tend to increase their leverage in good times making them more vulnerable to sudden downturns).

150. Ultimately, the weight of these margin calls brought down investment banks Bear Stearns and Lehman Brothers and contributed to the collapse of AIG. Carrick Mollenkamp et al., *Lehman's Demise Triggered Cash Crunch Around Globe*, WALL ST. J., Sept. 29, 2008; *see also* Serena Ng & Liam Pleven, *An AIG Unit's Quest to Juice Profit*, WALL ST. J., Feb. 5, 2009 at C1.

151. The ABX Index is available here: http://www.markit.com/information/products/category/indices/abx.html. Gorton and Shiller also make

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"boundedly rational" market participants important and readily accessible information about the value of CDOs held as collateral in the short term repurchase market. CDOs are illiquid investments and not generally traded. Until the introduction of this index, market information about the performance of CDOs was difficult to come by. The introduction of the ABX index, which tracked the performance of default swaps written against CDOs, provided market participants a source of information against which they could infer the value of illiquid CDO's.

Almost from its inception in January 2006, the value of this index declined.[152] The consequence of the decline in this index was a rapid devaluation of the value of assets held on the balance sheet of financial firms.[153] This decline had significant knock-on effects in the repo markets where CDOs were held as collateral.[154] The repo market is an overnight lending market

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this point. *See* GARY GORTON, THE PANIC OF 2007 and ROBERT SHILLER, THE SUBPRIME SOLUTION (2008) at 47. This index has been followed other indices tracking the performance of over-the-counter default swaps. *See* Matthew Leising & Shannon Harrington, *S&P Starts Three Default Swap Indexes a Year Later Than Planned,* BLOOMBERG NEWS SERVICE, Jan. 21, 2009, *available at* http://www.bloomberg.com/apps/news?pid=20601009&sid=aLCNBJIsERKs&refer=bond.

152. GORTON, *supra* note 45, at 22-23.

153. Prior to the introduction of mark-to-market accounting rules in 2006 ("FAS 157"), parties were permitted to carry the value of securities for which there was not a secondary market on their books at book value. FAS 157 requires that assets be carried on a firm's books at their fair value. FAS 157 requires that, if there were no observable market-based inputs to help determine fair value, a firm may rely on "unobservable inputs." The use of unobservable inputs permits holders of illiquid assets the ability to carry such assets on their books at close to, or even above, book value. If there is observable market data, either an active secondary market or activity in a related market that provides data that can provide a valuation of the assets, then such data must be used in order to calculate fair value. A market index of CDSs written against CDO securities, like the ABX, requires holders of other similar CDOs to use the index to assign a value to their securities. *Statement of Financial Accounting Standards No. 157: Fair Value Measurements* (Sept. 2006)., (Fin. Accounting Standards Bd. 2006) *available at* http://www.fasb.org/pdf/fas157.pdf.

154. *See generally* Office of the Inspector General, SEC, *SEC's Oversight of Bear Stearns and Related Entities,* Report No. 446-A (Sept. 25, 2008), *available at* http://www.sec-oig.gov/Reports/AuditsInspections/2008/446-b.pdf; *see also* Adrian & Shin, *supra* note 148; Mollenkamp et al., *supra* note 148; and Ng & Pleven, *supra* note 150, at C1. AIG also noted in its 2007 annual report that its valuation of CDOs held on its books was negatively impacted by the prices

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in which the borrower sells the lender the collateral with a promise to repurchase the collateral the next day for the value of the collateral plus some interest.[155] The collateral used in these transactions is typically a marketable security, like stocks or bonds. While these repurchase agreements are short term in nature they are highly secure for lenders, so lenders regularly roll over, or extend, the transactions, thus creating working capital for borrowers. These transactions can break down, however, when the collateral loses value.[156]

Both Bear Stearns and Lehman Brothers, like many other firms, relied on the repo market for their short term financing. Structurally, these firms were highly leveraged. Lehman's leverage ratio in 2007 was 31 to 1.[157] Just prior to Bear Stearns' collapse, its leverage ratio was reported to be 33 to 1.[158] For both firms, as well as AIG, CDOs were the securities used to back this borrowing in the repo market.[159] So long as the true value of these securities was determined by unobservable inputs, then these securities could be valued at near book value and both the lender and the borrower could turn a blind eye to the bad news in the real estate market. Once, the ABX index for CDOs was introduced, however, lenders had a market-based predictor of default risk for CDO securities and were required to use that data to infer a market price for collateral they were holding. The increasing likelihood of default of

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of default swaps for CDOs backed by U.S. residential mortgages. *AIG, supra* note 125, at 83.

155. Unlike central bank borrowing available to banking institutions, no central counterparty stands between a borrower in the repo market and lenders. Consequently, a default by one large borrower can be quickly transmitted throughout the financial system and affect remote, seemingly unrelated entities.

156. Kenneth Miller, *The U.S. Dollar Repo Market, in* SECURITIES LENDING REPURCHASE AGREEMENTS (Frank Fabozzi ed., 1997).

157. *Lehman to Report Lower 2nd-Quarter Leverage Ratios*, REUTERS.COM, June 4, 2008, http://www.reuters.com/article/gc06/idUSWEN604720080604.

158. Roddy Body, *The Last Days of Bear Stearns*, FORTUNE.COM, Mar. 31, 2008, http://money.cnn.com/2008/03/28/magazines/fortune/boyd_bear.fortune/.

159. AIG also relied on borrowing and lending activities in the repo markets. AIG, like Lehman and Bear Stearns, used CDOs as collateral in its borrowing and lending. In AIG's case, it borrowed against CDOs and then used the cash to invest in more CDOs and thus generate a higher return. When the value of this collateral collapsed, this placed large stress on AIG to liquidate positions and generate cash. *See* Ng & Pleven, *supra* note 150.

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such securities, as indicated by the ABX index, caused lenders in the repo market to raise their collateral requirements, or even refuse to accept CDOs as collateral.[160] This started the daisy-chain of distressed asset sales as market participants sold off higher quality assets to acquire Treasuries to use as collateral in the short-term markets.[161] When ultimately Bear Stearns and Lehman were unable to do this, both of these institutions collapsed.[162]

VI.
THE FAILURE OF PRIVATE ORDERING

It now appears clear that that the efficient capital markets hypothesis has run its course as an animating principle for deregulatory trend of the past three decades. Our collective mistake has been to design a regulatory structure that incorporated the assumptions of the market model while ignoring many of the important frictions (transaction and agency costs as well as socio-behavioral results) that can lead to market failures.[163] In short, policymakers have collectively confused an elegant model with a road map for action.[164]

Where information is costless, rational, self-interested market participants will seek to structure transactions to protect themselves from opportunistic behavior. In such a world,

160. By 2008, repo transactions involving corporate bonds or structured finance products were no longer possible. This created a rush to high-quality collateral (U.S. Treasuries) as repo market participants sold off low-quality assets in order to purchase high-quality assets that might be used in repo transactions. *See generally* Naohiko Baba, Blaise Gadanecz & Patrick McGuire, *Highlights of International Banking and Financial Market Activity*, BIS Q. REV. 25, 43 (Dec. 2008).

161. *Id.*

162. Ben Bernanke, *Reducing Systemic Risk: Remarks of Chairman Ben Bernanke at the Federal Reserve Bank of Kansas City's Annual Economic Symposium*, Jackson Hole, Wyo. (Aug. 22, 2008), *available at* http://www.federalreserve.gov/newsevents/speech/bernanke20080822a.htm (describing the collapse of Bear Stearns).

163. Coase noted his own frustration that so many observers had focused on the idea that markets operating in the absence of frictions should be able to reach efficient outcomes rather than the implication that real markets operating with those frictions face challenges to reaching efficient results on their own. *See generally*, RONALD COASE, THE FIRM, THE MARKET AND THE LAW (Univ. Chicago Press 1998) (1988).

164. *See generally*, RICHARD THALER, THE WINNER'S CURSE 4 (1992) (making the same point).

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prices will always reflect all the information available in the marketplace. Indeed there would be little place for regulation and the law as private parties costlessly contracted for solutions. Such a world only exists on the pages of textbooks, however. Assumptions of rationality in the market model are just that—assumptions—and not a description of actual outcomes.[165] By now, the empirical challenges to this ideological view of the market model are many.[166] While the market model assumes perfect information and perfect comprehension by market participants, we know that real market actors are limited in their cognitive ability, relying on heuristics to aid decision-making, thus leaving themselves susceptible to the problems of both transaction costs and agency costs. In addition, market participants exhibit biases, altruism, myopia, etc. They also disregard the permanent income hypothesis, act in irrational ways, and exhibit a host of other secular imperfections that put them at odds with the market model.[167] Market participants are also susceptible to bouts of euphoria associated with bubble markets.[168]

Although there are a number of elements present in the financial markets that might have made it possible for parties in these markets to rely on private ordering, in nearly every material instance over the past few years, these private ordering mechanisms failed to generate the desired outcome.[169] In

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165. Behavioral economists, including Thaler, also recognize this limitation. *See generally id.*; CHOICES, VALUES, AND FRAMES (Daniel Kahneman & Amos Tversky eds., 2000); JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES (Daniel Kahneman, Paul Slovic & Amos Tversky, eds., 1982); and BEHAVIORAL LAW & ECON. (Cass R. Sunstein ed., 2000).

166. The work of behavioral economists has contributed a great deal to understanding the limits of the market model in real life. Empirical challenges to the market model and the so-called "contractarian" approach to law are also increasingly common. *See, e.g.*, Robert Daines & Michael Klausner, *Do IPO Charters Maximize Firm Value?*, 17, J. L. ECON. & ORG. 83 (2001).

167. *See* Thaler, *supra* note 165; Kahneman & Tversky, *supra* note 165; Kahneman et al., *supra* note 165; and Sunstein, *supra* note 165.

168. Two asset price bubbles (tech stocks and real estate) over the past decade are proof of the truth of this statement. Kindleberger, *supra* note 3 (describing the pathology of a bubble).

169. Because of the amount and quality of information available and the generally low cost of entry and exit, financial markets are generally thought to be the most efficient markets available. In his classic book on the efficiency of financial markets Malkiel argued that financial markets are so effi-

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part, this failure stems from the fact that market participants are typically institutions and organizations represented by of individual agents (brokers, salesmen, etc.) and not rational actors per se. Each of the institutional agents acts with its own self-interest and with its own irrational biases that may compete with the interests of the principal. Even as the organization has the incentive to regulate its own opportunistic behavior, it has to cope with competing internal interests that might in fact encourage more opportunism.[170] Where the degree of friction is high, one cannot always expect institutions to demonstrate rational behavior. Where agents are able to influence institutional behavior, institutionally efficient private ordering may not be a consistent outcome. The failure of institutions to constrain their own opportunistic behavior was demonstrated in a number of ways.

First, even sophisticated investors exhibited cognitive limitations in their decision-making processes. CDO instruments are complex financial instruments. Rather than attempt to absorb and analyze all available information before making investment decisions, investors relied on heuristics.[171] The heuristic of most importance to many of these decisions was the

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cient that a blindfolded chimpanzee throwing darts at the Wall Street Journal can select a portfolio as well as one managed by an expert. BURTON G. MALKIEL, A RANDOM WALK DOWN WALL STREET 17 (W.W. Norton & Co. 2003).

170. For example, a bank originating a mortgage may have a long-term interest in developing and maintaining a reputation on the marketplace as an originator or high quality mortgages. The originating agent, however, may have a different interest—a commission or bonus tied to short term results. In such a situation, the incentives of the agent can work counter to the interests of the principal. This dynamic appears to have been common in the mortgage securitization market up until 2008. Alternatively, while a firm like AIG might have a long-term interest in maintaining its insurance business, actors within the firm may have had other, more short term interests, that compelled the firm adopt a particular bias with respect to the future of real estate markets and thus take on more risk than was advisable.

171. Jeffrey J. Rachinlinski, *The Uncertain Psychological Case for Paternalism*, 97 NW. U. L. REV. 1165 (2002) (relying on heuristics in the face of complex decisions); *see also* Lloyd Blankfein, *Do Not Destroy the Essential Catalyst of Risk*, FIN. TIMES, Feb. 9, 2009, at 7 (noting that investors relied on rating agencies because the underlying securities were too complex for them to understand), *available at* http://www.ft.com/cms/s/0a0f1132-f600-11dd-a9ed-0000779fd2ac,Authorised=false.html?_i_location=http%3Apercent2F%2Fwww.ft.compercent2Fcms%2Fs%2F0%2F0a0f1132-f600-11dd-a9ed-0000779fd2ac.html%3Fnclick_check%3D1&_i_referer=&nclick_check=1.

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letter-grade rating, an independent marker, provided by one of a number of rating agencies. Although lending standards fell during the period of the real estate bubble, the meaning conveyed by these independent markers did not. Ratings failed to identify a material change in the quality of assets backing AAA rated CDOs. Because the heuristic investors were relying on did not reflect the true underlying value of the investment instruments, cognitively limited market participants were not able to recognize this market failure until a lemons market for subprime assets had developed.[172]

With respect to the information asymmetries that might have existed between originators of mortgages and sponsors of CDO pools, one would expect rational actors to rely on vertical integration or the prospect of repeat transactions to increase information and thus reduce transaction costs.[173] By the tail end of the real estate bubble, sponsors of CDOs had begun to vertically integrate into the mortgage origination business.[174] The optimistic interpretation of their vertical integration was that the structured finance sponsors understood that they were facing high transaction costs and sought to reduce the information asymmetries associated with creating pools of mortgages for their CDO products. In this view, vertical integration would lead to higher quality as parties solved the lemons problem. The less optimistic interpretation is that the sponsors were not as interested in the quality of the underlying assets as they were in assuring access to a continuing stream of mortgage originations to feed new CDO pools. In hindsight, the latter interpretation appears to have been true.

Investment banks found themselves at the center of the lemons market in which they engaged in opportunistic behav-

172. Ratings agencies themselves may have been subject to an availability bias. The models used to value CDO assets did not include scenarios with a nationwide decline in housing prices of the sort that eventually occurred.

173. Williamson, *supra* note 115, at 112.

174. Lehman Brothers had control of at least two subprime originators, BNC Mortgage and Aurora Loan Services, which it merged into a single unit in 2007. Bear Stearns acquired a subprime mortgage origination unit Encore Credit Corp. in 2006. *See Bear Stearns to Acquire ECC Capital's Mortgage Origination Unit*, BUSINESS WIRE, Oct. 10, 2006, *available at* http://www.allbusiness.com/personal-finance/real-estate-mortgage-loans/3935237-1.html; *see also Lehman to Merge Two Residential Mortgage Units*, N.Y. TIMES, June 14, 2007, *available at* http://www.nytimes.com/2007/06/14/business/14lehman.html.

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ior with respect to counterparties and markets by supplying lower than stated quality instruments to buyers of CDOs. Agency costs can explain some of the failures within the financial institutions to constrain their own opportunistic behavior. Agents of the financial institutions did not share either the same incentives or time horizons of the institutions they represented. For example, CDO salesmen might be compensated with annual salaries and bonuses tied to short-term results, like the number of CDOs sponsored or sold. Their compensation was not necessarily tied to the long-term value of those mortgages or the ultimate performance of the CDO.[175] If successful agents can earn sufficient compensation over the course of one or two years, then their long-term interest decouples from the long-term interest of the firm.[176] In that respect, agents may have had more incentive to engage in opportunism, including excessively risky behavior, at the expense of the firm and its long-term reputational capital.[177]

In the credit default swap market, market participants also exhibited susceptibility to information asymmetries. Rather than investigate the underlying value of CDO instruments, parties relied on the credit rating heuristic to provide a reliable signal of the likelihood that a counterparty might default. The presence of an AAA rated insurance company, like AIG or MBIA, as a counterparty was sufficient to permit buyers to engage in these transactions without requiring the counterparty to commit collateral. Reliance on the rating of a CDS seller turned out to be misplaced. With respect to the sellers of default swaps themselves, they appeared to systematically underestimate the probability of a decline in national

175. The same dynamic is true of agents of mortgage originators with respect to new mortgage approvals.

176. The firm has a long-term interest in generating a valuable reputation, which can be converted into repeat transactions and additional firm value. With sufficient short-term compensation, agents of the firm become end-game players and thus more likely to engage in opportunistic behavior. Robert Axelrod, THE EVOLUTION OF COOPERATION (1984) (discussing the value of repeat transactions).

177. Such behavior might include structuring collateralized debt obligations of low quality and knowingly marketing them to long-term firm clients, as was the case in many of the major investment banks on Wall Street. Alternatively, it might involve agents of the firm engaging in risky one-way bets on asset prices, as was the case with AIG.

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real estate values and few assumed that it could happen.[178] As a consequence, firms like AIG undertook much more risk than was optimal (moral hazard). They were able to temporarily generate large cash flows off of CDS sales for which they thought they might never have to make payment and against which they put down no collateral. When it became apparent that insurers had systematically underestimated default probabilities, the insurers collapsed as counterparties began to demand collateral and payment on the contracts.

It is clear that, notwithstanding the availability of private ordering alternatives, none of the mechanisms on which one might typically rely, including vertical integration, iterative contracting, reputation, and reputational intermediaries, were effective in stemming opportunistic behavior. In some cases, the inability of private ordering mechanisms to stem opportunism can be traced to transaction and agency costs that interfere with the operation of the market mechanism. In others, efficient market operation was stymied by a systematic mispricing of risk by market participants. Specific changes can be adopted in order to address the specific shortcomings in the securitization model, the market for default swaps, as well as the utter failure of the NRSROs to play an effective private ordering role.

The market failures of the Financial Crisis of 2008 call us to address more than just micro level changes to the regulatory structure. Rather, the Financial Crisis of 2008 requires that we begin a wholesale reconsideration of our regulatory approaches. Our previous confidence that rational actors and market forces would provide the financial system with sufficient protections from opportunism and market collapse has proven itself inadequate to the task. Rather than generate more resilience and efficient allocations of capital, our hands-off approach towards regulation of financial markets resulted in speculative bubbles, over-leverage, and dangerous intercon-

178. Such an assumption may have been reinforced by an availability bias (there had not been a nationwide decline in housing prices in the U.S. since the Great Depression and the recent experience of Japan with declining asset values is remote). Coval, et al. note that the complexity of the CDO squared products makes it very easy to underestimate their default risk as rating agencies appear to have done. *See* Joshua Coval, et al., *The Economics of Structured Finance*, 23 J. ECON. PERSP. 3, 20 (2009); *see also* Rachinlinski, *supra* note 171, at 1170-71 (discussing availability biases).

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nections among financial institutions generating unwanted systemic risk. Going forward, we must refashion regulatory structures to take advantage of market incentives while recognizing and accounting for how the imperfections of the marketplace affect efficient decision-making.

A. *Covered Bonds and the Securitization Process*

The remoteness of the investor to the borrower that is typical of the "originate-to-distribute" model of securitization created incentives for originators to develop low quality asset pools. Complexity of the investment vehicles drove investors to rely on ratings, rather than due diligence, to guide investment decisions.[179] Consequently, a lemons market for securities backed by residential mortgages developed. The collapse of the market offers an opportunity to rethink the securitization model, and perhaps, structure a new approach that is both efficiency-enhancing, as well as sustainable over time.

A number of other commentators have recommended changes to the regulatory structures surrounding securitization to address the problems made evident by the collapse of the subprime market. Understandably many of these recommendations approach the issue from a consumer protection point of view. For example, Kathleen Engel and Patricia McCoy recommend a process model that would require originators of mortgages to conduct a minimum level of due diligence on every loan application in order to assure that low quality loans do not reach the securitization pool and to make originators liable to the trusts that hold the loans in the event they fall below the standard.[180] Noting that assigning liability to investors may not result in private enforcement actions, Christopher Peterson recommends assigning liability for violation of consumer protection laws to the investment banks that arrange securitizations.[181] By placing liability on the investment banks that arrange securitizations, Professor Peterson ar-

179. One consequence was that lending by large banks engaged in securitization resembled uninformed lending. *See* Loutskina & Strahan, *supra* note 87.

180. Engel & McCoy, *supra* note 61, at 2087-2090.

181. Christopher L. Peterson, *Predatory Structured Finance*, 28 CARDOZO L. REV. 2185, 2279-2281 (2007).

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gues that investment banks could avoid liability by simply dealing with non-predatory originators.[182]

While these recommendations have some merit, they do not adequately address the underlying incentives structures that led to the lemons market in real estate CDOs. In particular, the remoteness between origination and the securitization vehicle results in large transactions costs. The information asymmetries that stem from this relationship are likely large enough that it may be impossible for an investment bank arranging securitizations ever to have sufficient confidence in the quality of the underwriting process leading to a securitization. Rather than unbundling the credit process (contracting), the socially efficient outcome should require vertical integration on the lending process.[183]

Compare the originate-to-distribute model with a more traditional lending model where a financial institution both services and holds mortgages that it originates. Although incentives in the traditional lending model are more perfectly aligned to monitor against introducing lemons to the lending pool, and traditional lending results in the generation of more private information and therefore more informed lending, there are significant limits to this model.[184] First, this model limits the amount of capital available to a financial institution to the deposits it can raise internally.[185] Second, internally financing and holding loans makes it difficult for financial institutions to hedge geographic or sector risk. These limitations suggest that a return to the days before securitization might not be socially optimal.

Economists have long noted that if a bank can maintain an interest in a loan after selling it, then the originating institution has less incentive to engage in the type of opportunistic

182. *Id.* There are lawsuits presently pending that test a version of the claims Peterson put forward. Specifically, Ambac has a pending law suit against Bear Stearns claiming that in organizing CDOs against which Ambac ultimately sold default swaps that Bear Stearns violated its representations and warranties relating to, among other things, its due diligence and underwriting standards as they pertained to the underlying assets in the CDO pool. *See* Complaint Ambac/Bear Stearns, *supra* note 104.

183. Oliver E. Williamson, *supra* note 115, at 112.

184. Loutskina & Strahan, *supra* note 87.

185. Gary B. Gorton & George G. Pennacchi, *Banking and Loan Sales: Marketing Nonmarketable Assets*, 35 J. MONETARY ECON. 389, 401 (1995).

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behavior endemic to the originate-to-distribute model.[186] Changes in accounting rules could encourage financial institutions that originate residential mortgages to maintain interests in the loans they originate, thereby aligning internal incentives.[187] By eliminating the ability of originators to account for sales of loans as true sales, and although continuing to permit accounting for partial sales, financial institutions could still get the benefit of securitization while retaining some of the risks of the loans.[188] Although the incentives associated with maintaining an interest more closely align the interests of the originator and the investor, they are not perfect.[189] On the margin, banks that are not bearing the full cost of the contingent liability associated with loans they originate have an incentive to add low quality loans to a securitization pool.

By implication, a more efficient financing structure would be one that both permits originating financial institutions the ability to access capital markets while overcoming the information asymmetries associated with origination. In the Summer of 2008, the Department of the Treasury, the Federal Reserve and the FDIC began encouraging the development of covered bonds.[190] Covered bonds are an innovation that permits finan-

186. *Id.* at 390 (1995); *see also* Hayne & Pyle *supra* note 4, at 372 (noting that investing one's own capital is a credible signal about the quality of the underlying asset).

187. FASB 140 permits securitizations to be accounted for in one of the following ways: a sale (where the seller has no continuing interest in the loan), as a financing (where the transfer fails to meet one of the conditions of FASB 140), as neither a sale nor a financing (a swap) or as a partial sale (where the transferor retains the servicing interest or some other interest in the bonds that result from the securitization). *See* FINANCIAL ACCOUNTING STANDARDS BOARD, ORIGINAL PRONOUNCEMENTS VOL II: FASB STATEMENTS OF STANDARDS 121-159, FAS140-1 (June 2007). Financial Accounting Standards Board, No. 140 (Sept. 2000); *see also* MARTY ROSENBLATT & JIM JOHNSON, SECURITIZATION ACCOUNTING UNDER FASB 140 7 (Deloitte & Touche 1st ed., 2001), *available at* http://www.securitization.net/pdf/acc_fasb140.pdf.

188. ROSENBLATT & JOHNSON, *supra* note 187, at 7.

189. Gorton & Pennacchi, *supra* note 185, at 401.

190. Press Release, U.S. Department of the Treasury, Secretary Henry M. Paulson Statement on Covered Bonds (July 28, 2008), *available at* http://www.treas.gov/press/releases/hp1101.htm; Press Release, Board of Governors of the Federal Reserve System, Governor Kevin Warsh Remarks on Covered Bond Framework, (July 28, 2008), *available at* http://www.federalreserve.gov/newsevents/speech/warsh20080728a.htm; *see also* Press Release, Federal Deposit Insurance Corporation, FDIC Board Approves Final Covered Bond Policy Statement, (July 15, 2008), *available at* http://www.fdic.

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cial institutions to align incentives while accessing capital markets.[191]

In a covered bond transaction, the originating financial institution "ring-fences" a pool of mortgages on its balance sheet. The institution is then able to issue bonds in the capital markets backed by that pool of mortgages.[192] The issuer is required to maintain the performance of the pool, replacing non-performing assets with performing ones.[193] Although the bonds are backed by the cover assets, the issuer remains liable for the repayment of the bonds. In bankruptcy, the mortgages backing the bonds are protected from the bank's creditors. The assets in the ring-fenced pool would continue to service the bonds. In the event the ring-fenced assets are not sufficient to pay bondholders, bondholders then become creditors of the bank on par with other creditors.[194] In that way, bondholders have recourse both through the asset pool, as well as directly against the issuer, as creditors.[195]

Ring-fencing assets and leaving them on one's books, makes it possible to raise additional capital through a securitization-like process. Because the assets remain on the books of the issuer, incentives are aligned in a manner that overcomes the problems of information asymmetries inherent in the orig-

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gov/news/news/press/2008/pr08060.html. Secretary Henry M. Paulson Statement on Covered Bonds, U.S. DEP'T OF TREASURY., July 28, 2008; Governor Kevin Warsh Remarks on Covered Bond Framework, BOARD OF GOVERNORS OF THE FED. RES. SYS., July 28, 2008; *see also* FDIC Board Approves Final Covered Bond Policy Statement, FDIC PRESS RELEASE, July 15, 2008.

191. Although covered bonds are new to the U.S. capital market, they are common in European markets where they have a long history and are available in nearly all European markets. U.S. DEP'T OF TREASURY, BEST PRACTICES FOR COVERED BONDS 9 (July 2008); *see also* Frank Packer, Ryan Stever & Christian Unger, *The Covered Bond Market*, 9/07 BIS Q. REV. 43 (Sept. 2007).

192. FEDERAL DEPOSIT INSURANCE CORPORATION, COVERED BOND POLICY STATEMENT (July 15, 2008), *available at* http://www.fdic.gov/regulations/laws/rules/5000-1550.html#5000coveredbond.

193. This is an improvement over current securitization practices, which do not require originators to maintain the quality of a pool of mortgages beyond a 60 or 90 initial window.

194. U.S. DEP'T. OF TREASURY, BEST PRACTICES FOR COVERED BONDS (July 2008).

195. Packer et al., *supra* note 191, at 44.

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inate-to-distribute model.[196] The covered bond aligns incentives and permits originators to get access to capital markets to expand lending. Because maintaining a cover pool can be a costly signal, thinly capitalized mortgage companies and brokers—those most likely to engage in predatory lending practices—may find it impossible to sponsor covered bonds and can be expected to drop out of the market.[197]

B. *Clearinghouses for Default Swaps*

Derivative transactions can be valuable and efficiency enhancing transactions. Parties can enter into such transactions to hedge against real risks, like the price of fuel increasing or the likelihood of an important creditor defaulting. These hedges are socially efficient. Banning default swaps completely as some have suggested would be a mistake.[198] On the other hand, the experience with the CDS market during the Financial Crisis of 2008 suggests that the regulatory exemption provided under the Commodity Futures Modernization Act for over-the-counter derivatives has not resulted in the robust private ordering of such transactions that was expected. Indeed, the over-the-counter default swap market appears to have been subject to considerable moral hazard by both sellers and buyers. Given the importance of counterparty risk and ability of credit default swaps to act as financial accelerators if a counterparty defaults, their use should be subject to increased supervision. A clearinghouse, or universal counterparty, for default swaps addresses the underlying institutional incentives that create moral hazard while also serving a useful circuit-breaker function.[199]

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196. Which includes raising capital at prices less than the cost of additional deposits. For discussion of the cost of capital in banking, *see* Gorton & Pennacchi, *supra* note 185, at 394.

197. Although costly and credibly signal quality to potential counterparties, they can result in overinvestment and therefore be socially inefficient. Following the Financial Crisis of 2008, it is likely that the costs associated with such a signal are lower than the costs associated with permitting a lemons market in the securitization market to develop. Michael Spence, *Informational Aspects of Market Structure: An Introduction*, 90 Q. J. ECON. 591, 596 (1976) (discussing the social cost of signals).

198. George Soros, *The Game Changer*, FIN. TIMES, Jan. 29, 2009 at 8 (arguing that default swaps should be banned).

199. Establishment of a central clearinghouse for derivatives is currently under consideration. Ciara Linnane & Karen Brettell, *NY Fed to Push Ahead*

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Clearinghouses undertake four important functions. First, clearinghouses can exclude low quality trading parties and limit trading to repeat players.[200] Second, clearinghouses can ensure transparency in the trading system, providing market participants transparent information on pricing. Third, clearinghouses can ensure liquidity in a marketplace.[201] And finally, clearinghouses undertake an important mutual insurance function.[202] When a member of a clearinghouse fails, the clearinghouse steps into its shoes and completes the trade. Without that function, failure by one party in a transaction could transmit through the financial system. The clearinghouse, through its insurance function, can act as a circuit-breaker, creating confidence in the ability of counterparties to complete transactions and limiting the degree to which weaknesses in one counterparty can transmit themselves throughout the financial system.[203] The clearinghouse can thus dampen the effect of financial accelerators. By acting as "a party to all trades" the clearinghouse is able to "mutualize" the risks of opportunism and thus adequately monitor market participants.[204] In times of stress, the clearinghouse provides a mutual insurance function (carrying out a temporary vertical

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with CDS Market Regulation, REUTERS, Oct 7, 2008 *available at* http://www.reuters.com/article/bankingFinancial/idUSN0638244120081007; *see also* Paul J. Davies, *Credit Derivative Drive Hits a Wall*, FINANCIAL TIMES, February 2, 2009 at 14 (discussing clearinghouse proposals), *available at* http://www.ft.com/cms/s/0/ab795eb0-ef07-11dd-bbb5-0000779fd2ac.html?nclick_check=1

200. Jon R. Moen & Ellis W. Tallman, *Clearinghouse Membership and Deposit Contraction during the Panic of 1907*, 60 J. ECON HIST. 145, 147 (2000) (stating that clearinghouses are able to generate significant amounts of member specific information).

201. *Id.*

202. Randall S. Kroszner, *Can the Financial Markets Privately Regulate Risk? The Development of Derivatives Clearinghouses and Recent Over-the-Counter Innovations*, 31 J. MONEY, CREDIT & BANKING 596 (1999); *see also* Randall S. Kroszner, *Lessons from Financial Crises: The Role of Clearinghouses*, 18 J. FIN. SERVICES RES. 157 (2000) and Moen & Tallman, *supra* note 200, at 147.

203. In that way clearinghouses can engage in "contingent integration at times of distress." Vertical integration can be an effective private ordering solution when faced with the prospect of moral hazard. Kroszner, *Can the Financial Markets Privately Regulate Risk?*, *supra* note 202, at 607.

204. Trusts that were not members of a clearinghouse suffered runs and got in trouble. Kroszner, *Lessons from Financial Crises*, *supra* note 202; *see also* Ben Bernanke, *Clearing and Settlement during the Crash*, 3 REV. FIN. STUD.133, 144 (1990).

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integration of all market participants), thus guaranteeing trades and stopping the daisy-chain liquidation dynamic of financial panics.[205]

Clearinghouses also maintain the power to exclude. The power to exclude reduces incentives for participants to engage in moral hazard. Because continued access to the clearinghouse structure requires that they refrain from opportunistic behavior, market participants have an incentive to more closely regulate their own risk taking behavior. Of course, the exclusion power requires that clearinghouses are granted rights undertake close oversight of market participants. While clearinghouse participants may have some incentive to take risky bets knowing that the clearinghouse will step up in the event they default, this risk can be mitigated by clearinghouse rules that permit the clearinghouse access to highly specific information about its members—their liquidity, as well as their participation in the market.[206] Access to this level of information would permit the clearinghouse to understand the net risk position of every member of the clearinghouse and thereby be able to place trading restrictions on members operating in excess of prudential limits.

On balance, a mandatory clearinghouse for derivative trades, through repeal of the CFMA's exemption for counter derivatives, would be socially desirable and would reduce many of the negative social costs associated with market participants' previous failure to engage in private ordering with respect to these contracts.

Although the credit default swap acts like an insurance contract in many respects, it also shares attributes of a short sale against an equity position.[207] Importantly, the lack of a

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205. Kroszner, *supra* note 202, at 159.

206. Bernanke suggests that a clearinghouse may not be able to survive a "meltdown" event. However in the case of a meltdown event, the Federal Reserve must be thought of as part of the clearing system and should step in to provide liquidity. Bernanke, *supra* note 204, at 145.

207. In a short sale, one expects the future price to be less than the current price. When that is the case, one can borrow a share of stock on day 1 promising to return it to the owner on day 2. After borrowing the stock, the short-seller sells it on the open market. On day 2, the stock price falls. The short seller then buys a share on the market and returns it to person who lent it to her. The short seller profits from the difference between the sale price on day 1 (high) and the purchase price on day 2 (low).

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requirement that one of the parties to a default swap have an insurable interest at stake gives the contracts the malleability that permit the creation of synthetic securities.[208] The lack of an insurable interest requirement allows buyers of default swaps to engage in a form of "naked" shorting. Naked shorting involves selling an equity which you do not own in an attempt to profit off price declines. Naked shorting is illegal in U.S. markets.[209] Buying default swaps, essentially a bet that the reference entity will fail, of an entity in which the buyer of the swap has nothing at stake is not.

In the absence of a transparent and liquid market for default swaps, market participants can, and likely do, engage in short selling via a default swap position. Consequently, transaction costs are high for market participants seeking to engage in short sales. However, if clearinghouses are instituted for the trading of default swaps these markets will become much more transparent, thus lowering transaction costs for market participants seeking to engage in taking naked short positions in an equity by way of a default swap.

In order to forestall excessive naked shorting in a more transparent CDS market, proposals to require an "insurable interest" together with a CDS contract should not be dismissed out of hand.[210] Requiring an interest permits investors who wish to hedge a transaction with a counterparty to access the markets in order to do so. On the other hand, by not permitting naked default swaps, regulators can limit the ability of such default swaps to act as a financial accelerator.

The likely consequence of an insurable interest rule will be the end of synthetic derivative products involving a reported 80 percent of default swaps.[211] This may be controver-

208. Schwartz, *supra* note 117, at 173 (discussing the lack of insurable interest requirement for default swaps).

209. SEC, *Naked Shorting Selling Rule*, http://sec.gov/rules/final/2008/34-58774.pdf.

210. Cong. Collin Peterson, chairman of the House Agriculture Committee has introduced legislation to prohibit naked CDS contracts. This draft legislation may be too restrictive in that it requires both a buyer and a seller of a default swap to have an interest in the event. It may be more appropriate to require a financial interest on only one side of the transaction. *See* Discussion Draft of *Derivatives Markets Transparency and Accountability Act of 2009* (on file with author).

211. *Credit Default Chopped*, FIN. TIMES, Feb. 2, 2009, at 12.

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sial in some circles. However, given the recent experience with default swaps, and synthetic derivative products in particular, the burden of proof should be on defenders of the synthetic derivative product to prove such products are more valuable than the systemic risks they generate as financial accelerators and providers of market leverage.[212]

C. *The Rating Agency Problem*

The ratings agencies played a central role in facilitating the development of information asymmetries. In short, investors relied on the rating agencies to act as reputational intermediaries.[213] As such, their ratings provided an important heuristic for investors who found CDOs and default swaps too complex to understand themselves. In hindsight it is now clear that rating agencies failed as reputational intermediaries and that the value of their ratings as heuristics was circumspect.

Others have already noted the consequences of the inherent conflict of interest that arises when rating agencies become dependent on large percentages of their revenues from only a small number of sponsors of structured finance vehicles.[214] This conflict is evident by the sheer number of AAA rated structured finance products on the market. By one estimate, there were only 12 AAA rated corporate bond issuers at the end of 2008, while, at the same time, there were almost 64,000 AAA rated structured finance products.[215]

The rating agencies have also been the subject of recurrent regulatory fixes: first, following the collapse of Enron, and now, in the aftermath of the Financial Crisis of 2008.[216] More recently, rules promulgated by the SEC increase disclosure re-

212. Goldman Sachs, Annual Report (Form 10-K) (Jan. 27, 2009) (citing the risk to its business in the event default swaps are subjected to regulation).

213. Kroszner, *supra* note 202, at 609.

214. Blankfein, *supra* note 171; Joshua Coval, Jakub Jurek & Erik Stafford, *The Economics of Structured Finance*, 23 J. ECON. PERSP. 3 (2009); *see also* SEC Staff Report, *supra* note 97, at 23, 32 (noting that 11 sponsors accounted for 80 percent of the structured finance deals in both number and volume).

215. Blankfein, *supra* note 171.

216. THE CREDIT RATING AGENCY REFORM ACT OF 2006 (PL-109-291); Securities Exchange Commission, *Amendments to Rules for Nationally Recognized Statistical Rating Organizations*, Release No. 34-59342, Feb. 2, 2009 (hereinafter *NRSRO Amendments*).

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quired of rating agencies, particularly as their work relates to the rating of structured finance products.[217] They also eliminate obvious potential conflicts of interest as they relate to the work of the consulting operations of the large rating agencies by prohibiting a rating agency from rating any investment vehicle that it had a hand in designing.[218]

The SEC has proposed additional rules to deemphasize the value of the rating agencies' regulatory licensing power.[219] These proposed rules seek to deemphasize the power of rating agencies by writing them out of the rules. For example, a mortgage-related security is defined in Section 3(a)(41) of the Exchange Act as, among other things, "a security that is rated in one of the two highest rating categories by at least one nationally recognized statistical rating organization."[220] The SEC proposes to eliminate references to rating agencies in its new definition of mortgage-related securities, focusing instead on other factors more relevant to the definition of such an asset-backed security.

The SEC's focus on reducing the regulatory licensing power of rating agencies follows earlier work by Professors Partnoy and Skeel recommending a similar approach. Their approach to deemphasizing the position of rating agencies is largely correct.[221] Rather than increase reliance on rating agencies, Professors Partnoy and Skeel suggest relying instead on the default swap market for signals about the likelihood of default of bonds and structured finance vehicles.[222] This is a controversial position given recent events with respect to the default swap market. However, subject to sufficient regulation of the marketplace (as outlined above), default swap markets will likely be a more accurate forward-looking metric of the

217. *NRSRO Amendments, supra* note 216.

218. Many rating agencies have affiliates that offer clients a service providing guidance on structuring transactions so as to receive the highest possible rating. The conflicts presented by these activities is not dissimilar to the conflicts presented by auditing firms undertaking consulting work for their audit clients. *Id.*

219. SEC Release No. 33-8940 (July 1, 2008) and SEC Release No. 34-58070 (July 1, 2008).

220. SEC Release No. 33-8940 (July 1, 2008), at 7 (*citing* 15 USC 78c(a)(41)).

221. Partnoy & Skeel, *supra* note 145.

222. *Id.*

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likelihood of default than the current rating agency alternative, which has been criticized for being backward looking and not providing investors with useful information regarding the likelihood of future events.[223]

VII.
CONCLUSION

This Article analyzes the Financial Crisis of 2008 in the context of failures by market participants to engage in private ordering thus leading to opportunistic behavior at the expense of market stability. The Financial Crisis of 2008 offers a decidedly negative verdict on a decades-long project to deregulate financial markets and to rely on private ordering mechanisms, including securitization and default swaps, to mitigate opportunistic behavior and improve market efficiency. Although these mechanisms may have been intended to add to market resilience, they have instead proven to be a source of additional information asymmetries and instability in the marketplace.

The regulatory approach of the past two decades, which relied in great measure on private parties fending for themselves, helped to generate a number of innovations and positive developments in finance, but failed, ultimately, to result in more resilient financial markets. Indeed, since the 1970s global financial markets have been more susceptible to booms and crashes than any time since the 1930s.[224] As a consequence, we are left struggling for a new regulatory path forward that recognizes that market participants are not *homo economicus*, but rather, human agents subject to the frailties of euphoria and perhaps even the occasional self-delusion.[225]

The events of 2008 suggest that private ordering as a central component of the regulatory effort has largely failed to create resilient financial markets. The deregulation of bank holding companies resulted in large concentrations of bank-

223. *Id.*

224. Jean Tirole, FINANCIAL CRISES, LIQUIDITY, AND THE INTERNATIONAL MONETARY SYSTEM (2002), at x.

225. Richard H. Thaler, *From Homo Economicus to Homo Sapiens*, 14 J. ECON. PERSP. 133 (2000) (noting that man is not the *homo economicus* of the market model); *see also* Kindleberger, *supra* note 3 (describing the mechanics of bubbles and the roles of euphoria and self-delusion).

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ing institutions that have proven themselves dangerously fragile and excessively prone to taking on risk in the form of CDOs. The exemption of default swaps from oversight and regulation created a moral hazard so large as to threaten the entire financial system when certain counterparties took on more risk than was ultimately prudent. The theoretical underpinning of each of the deregulatory moves above was that private ordering would result in socially efficient outcomes as each party to a particular transaction sought to protect its own self-interest. In each case, however, private ordering failed to constrain opportunistic behavior.

What is needed as part of this refashioning is to closely examine the institutional and micro incentives (including incentives of agents) in order to address the question of excessive reliance on heuristics that ultimately hobbled markets leading up to the Financial Crisis of 2008. With respect to mortgage lending and securitization, this may mean adopting new models of financing, such as the covered bond. In fact, given the current experience of the investing public and the resulting availability heuristic that will likely linger for some time, markets may demand regulatory changes of this type with respect to securitization before investors begin to actively invest again. With respect to default swaps, institutional incentives to take on more risk than optimal might be addressed by the establishment of a universal clearinghouse for default swap transactions. Both of these changes recognize that the earlier hands-off approach relying on sophisticated investors to protect themselves will likely have to be abandoned for an alternative approach. On the other hand, the NRSROs have clearly failed to perform their intended private ordering function. Changes with respect to their role will likely require that we deemphasize their role and thus look for alternative mechanisms to signal the credibility of potential borrowers to lenders. With respect to NRSROs these changes may require that we rely more on market based mechanisms than we have previously.

Forward-looking changes to our regulatory approach will require that we recognize the failures of an ideological devotion to markets as regulators and adopt a posture of pragmatism. This new era of pragmatism begins with an understanding that markets are useful but subject to their own limitations. Such limitations include the effects of transaction and agency

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costs on the proper functioning of the marketplace. They also include an understanding that market participants often deviate from assumed behaviors. We know from the work of behavioral economists that deviations from market outcomes, like over-optimism leading to speculative bubbles, are often predictable. The proper role of regulation in such circumstances should be to recognize the inherent biases and then reduce the likely negative externalities associated with such behavior. Such a pragmatic approach balances maximization norms with a requirement for stability in the financial system resulting in less systemic risk and a more sustainable growth trajectory going forward.

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