
Essay

Protecting Financial Markets: Lessons from the Subprime Mortgage Meltdown

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INTRODUCTION

Congress has been holding hearings on threats to the financial system in response to the recent subprime¹ mortgage meltdown and its impact on the mortgage-backed and other asset-backed securities markets and on credit markets generally.² Central banks and governments worldwide have likewise expressed concern about this crisis and its potential systemic effects.

Initial remedial steps were focused on banks. The United States Federal Reserve Bank, for example, attempted to reduce the likelihood that this crisis might affect other financial markets and the economy by cutting both the discount rate, which is the interest rate the Federal Reserve charges a bank to borrow funds when a bank is temporarily short of funds,³ and the

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1. The term “subprime” includes both loans to borrowers of dubious creditworthiness and very large loans to otherwise creditworthy borrowers.

2. See, e.g., *Systemic Risk: Examining Regulators’ Ability to Respond to Threats to the Financial System: Hearing Before the H. Comm. on Financial Serv.*, 110th Cong. (2007) [hereinafter *Systemic Risk Hearing*]. As this Essay was going to press, Congress enacted, and the President signed the Emergency Economic Stabilization Act of 2008, Pub. L. 110-343, 122 Stat. 3765.

3. See Greg Ip et al., *Stronger Steps: Fed Offers Banks Loans Amid Cri-*

federal funds rate, which is the interest rate banks charge other banks on interbank loans.⁴ The European Central Bank and other central banks similarly cut the interest rate they charge to borrowing banks.⁵

These steps, ironically, directly impacted banks, but not the financial markets whose very fall was weakening banks.⁶ In medical terms, it was as if a doctor were attempting to cure a patient by focusing on curing symptoms, not the underlying disease.⁷ Changes in monetary policy may not work quickly enough—or may be too weak—to quell panics, falling prices, and the potential for systemic collapse.⁸

This somewhat anachronistic focus on banks, not markets, ignores new trends in the global marketplace. Increasingly, the financial system is characterized by disintermediation, which enables companies to access the ultimate source of funds, the capital markets, without going through banks or other financial intermediaries.⁹ An exclusive bank-focused approach simply

sis, WALL ST. J., Aug. 18, 2007, at A1.

4. See Greg Ip, *Fed's Rate Cut Could Be Last For a While*, WALL ST. J., Nov. 1, 2007, at A1.

5. See Randal Smith et al., *How a Panicky Day Led the Fed to Act: Freezing of Credit Drives Sudden Shift; Shoving to Make Trades*, WALL ST. J., Aug. 20, 2007, at A1.

6. Ip et al., *supra* note 3 (“[The Fed’s] discount window’s reach in the current crisis is limited by the fact that only banks can use it, and they aren’t the ones facing the greatest strains.”).

7. Cf. *How Three Economists View a Financial Rescue Plan*, N.Y. TIMES, Sept. 22, 2008, at C4. In this article, the author states that the U.S. Treasury Department’s proposal to use government money to purchase mortgage-backed securities held by banks and other financial institutions was “the first serious attempt by government to cure the underlying financial disease and not merely its symptoms.” *Id.* The author goes on to state that financial institutions are in trouble “because of falling prices of mortgage-backed and other securities, requiring these institutions to market their securities down to the collapsed market prices . . .” *Id.*

8. Mortimer B. Zuckerman, *Preventing a Panic*, U.S. NEWS & WORLD REP., Feb. 11, 2008, at 63 (observing that “[l]ower interest rates promoted by the Federal Reserve Bank cannot fully counter the forces of credit and liquidity contraction” caused by the subprime mortgage crisis); see Seth Carpenter & Selva Demiralp, *The Liquidity Effect in the Federal Funds Market: Evidence from Daily Open Market Operations*, 38 J. MONEY CREDIT & BANKING 901, 918–19 (2006) (concluding that although a change in monetary policy can begin to affect the cost of capital within a day, its full effects can take much longer); Serena Ng et al., *Fed Fails So Far in Bid to Reassure Anxious Investors*, WALL ST. J., Aug. 21, 2007, at A1.

9. See Steven L. Schwarcz, *Enron and the Use and Abuse of Special Purpose Entities in Corporate Structures*, 70 U. CIN. L. REV. 1309, 1315 (2002). Capital markets are now the nation’s and the world’s most important sources of investment financing. See MCKINSEY GLOBAL INST., MAPPING THE GLOBAL

does not keep up with underlying changes in the financial system.¹⁰ In a financially disintermediated world, the old protections are no longer reliable.

This Essay seeks to understand what new protections are needed by exploring why the subprime financial crisis occurred, notwithstanding the array of existing protections included in financial regulation, market norms and customs, and the market-discipline approach undertaken by the second Bush administration.¹¹ The Essay begins by identifying anomalies and obvious protections that failed to work. It then searches for lessons by examining various hypotheses of why these anomalies and failures occurred.

I. IDENTIFYING ANOMALIES AND FAILURES

The following represent anomalies arising from, and protections that failed to deter, the subprime mortgage meltdown: (A) disclosure provides investors with all the information they need to assess investments, yet many investors made poor decisions; (B) securitization and other forms of structured finance (collectively, “structured finance”), pursuant to which mortgage-backed and other forms of asset-backed securities are issued, are supposed to diversify and reallocate risk to parties best able to bear it, yet structured finance did not protect many investors in mortgage-backed securities; (C) the subprime mortgage meltdown originally related to subprime mortgage-backed securities markets, but it quickly infected the markets for prime mortgage-backed securities and other asset-backed

CAPITAL MARKET THIRD ANNUAL REPORT 8 (2007), available at http://www.mckinsey.com/mgi/reports/pdfs/third_annual_report/CapMarkets_perspective.pdf (reporting that as of the end of 2005, the value of total global financial assets, including equities, government and corporate debt securities, and bank deposits, was \$140 trillion).

10. Although there is some concern about capital levels at banks, the losses giving rise to this concern are not due to bad mortgage loans made by those banks but rather to investments in mortgage-backed securities or loans made to entities, such as hedge funds, holding mortgage-backed securities as assets. See *infra* note 64 (reporting on write-downs stemming from bad mortgage-backed securities); see also David Wessel, *Magnifying the Credit Fallout*, WALL ST. J., Mar. 6, 2008, at A2 (discussing the erosion of the capital level at banks due to the falling value of bank-owned mortgage loans and mortgage-backed securities).

11. See Anthony W. Ryan, Assistant Sec’y for Fin. Mkts., U.S. Dep’t of the Treasury, Remarks Before the Managed Funds Association Conference (June 11, 2007) (transcript available at <http://www.ustreas.gov/press/releases/hp450.htm>) (discussing the market-discipline approach).

securities;¹² (D) the second Bush administration expected that its market-discipline approach, along with existing protections, would be sufficient to protect against financial market instabilities, but this approach turned out to be insufficient; and (E) rating agencies purport to assess an investment's safety, but they failed to anticipate the defaults. As this Essay will show, most of the causes of these anomalies and failures can be attributed to conflicts of interest, investor complacency, and overall complexity, all exacerbated by cupidity.

Examining hypotheses of why these anomalies and failures may have occurred requires explanation of certain structured finance terminology. The issuer of mortgage-backed and other forms of asset-backed securities in structured finance transactions is typically a special-purpose vehicle, or "SPV" (also sometimes called a special-purpose entity, or "SPE").¹³ These securities are customarily categorized as mortgage-backed securities ("MBS"), asset-backed securities ("ABS"), collateralized debt obligation ("CDO"), or ABS CDO.¹⁴ MBS are securities whose payment derives principally or entirely from mortgage loans owned by the SPV.¹⁵ ABS are securities whose payment derives principally or entirely from receivables or other financial assets—*other than mortgage loans*—owned by the SPV.¹⁶ Industry participants refer to transactions in which SPVs issue MBS or ABS as "securitization."¹⁷

The term "securitization" also technically includes CDO and ABS CDO transactions. CDO securities are backed by—and thus their payment derives principally or entirely from—a mixed pool of mortgage loans and/or other receivables owned by an SPV.¹⁸ ABS CDO securities, in contrast, are backed by a mixed pool of ABS and/or MBS securities owned by the SPV, and thus their payment derives principally or entirely from the underlying mortgage loans and/or other receivables ultimately backing those ABS and MBS securities.¹⁹ For this reason, ABS

12. For an explanation of the types of securities involved in the subprime financial crisis, see *infra* notes 14–26 and accompanying text.

13. See JOHN DOWNES & JORDAN ELLIOT GOODMAN, *DICTIONARY OF FINANCE AND INVESTMENT TERMS* 662–63 (7th ed. 2006).

14. There are arcane variations on the CDO categories, such as CDOs "squared" or "cubed," but these go beyond this Essay's analysis.

15. See DOWNES & GOODMAN, *supra* note 13, at 434–35.

16. See *id.* at 35.

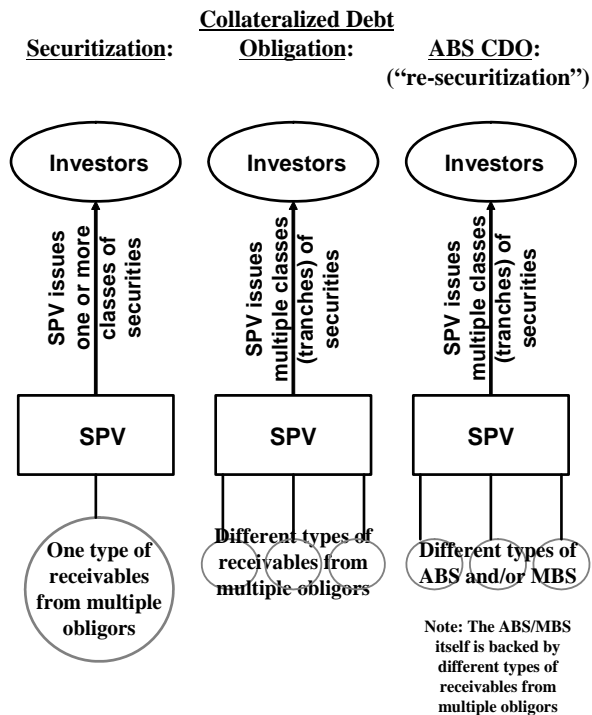
17. See *id.* at 630.

18. See *id.* at 121.

19. "Synthetic" CDOs, which do not appear to be relevant to this Essay's

CDO transactions are sometimes referred to as “re-securitization.”

Schematically, the distinctions among these categories can be portrayed as follows:



The classes, or “tranches,” of MBS, ABS, CDO, and ABS CDO securities issued in these transactions are typically ranked by seniority of payment priority.²⁰ The highest priority class is called senior securities.²¹ In MBS and ABS transactions, lower priority classes are called subordinated, or junior, securities.²² In CDO and ABS CDO transactions, lower priority classes are usually called mezzanine securities²³—with the lowest priority class, which has a residual claim against the SPV, called the equity.²⁴

analysis, own derivative instruments, such as credit-default swaps, rather than receivables, ABS, or MBS.

20. See DOWNES & GOODMAN, *supra* note 13, at 749.

21. See *id.* at 637.

22. See *id.* at 369.

23. See *id.* at 421.

24. In MBS and ABS transactions, the term “equity” is not generally used

The senior and many of the subordinated classes of these securities are more highly rated than the quality of the underlying receivables.²⁵ For example, senior securities issued in a CDO transaction are usually rated AAA even if the underlying receivables consist of subprime mortgages, and senior securities issued in an ABS CDO transaction are usually rated AAA even if none of the MBS and ABS securities supporting the transaction are rated that highly. This is accomplished by allocating cash collections from the receivables first to pay the senior classes and thereafter to pay more junior classes (the so-called “waterfall” of payment).²⁶ In this way, the senior classes are highly overcollateralized to take into account the possibility, indeed likelihood, of delays and losses on collection.

The subprime financial crisis occurred because, with home prices unexpectedly plummeting²⁷ and adjustable-rate mortgage (ARM) interest rates skyrocketing,²⁸ many more borrowers defaulted than anticipated,²⁹ causing collections on subprime mortgages to plummet below the original estimates. Thus, equity and mezzanine classes of securities were impaired, if not wiped out, and in many cases even senior classes

because the company originating the securities (the “Originator”) usually holds, directly or indirectly, the residual claim against the SPV. *See id.* at 491 (defining “originator”).

25. *See id.* at 121 (defining CDO as an investment-grade bond backed by a diversified pool of bonds including junk bonds). The equity class is generally not rated.

26. *See* Investopedia, <http://www.investopedia.com/terms/w/waterfallpayment.asp> (last visited Sept. 20, 2008) (defining waterfall payment as “[a] type of payment scheme in which higher-tiered creditors receive interest and principal payments, while the lower-tiered creditors receive only interest payments. When the higher tiered creditors have received all interest and principal payments in full, the next tier of creditors begins to receive interest and principal payments”).

27. *See* Kemba J. Dunham & Ruth Simon, *Refinancing May be Harder to Enjoy*, WALL ST. J., Nov. 24, 2007, at B1 (discussing the difficulty of refinancing due to tighter lending standards and falling home prices).

28. Rick Brooks & Constance Mitchell Ford, *The United States of Subprime*, WALL ST. J., Oct. 11, 2007, at A1 (analyzing high-rate mortgages). Although rate increases on ARM loans (through rate resets) were not per se unexpected, the end of the liquidity glut made it harder for subprime borrowers to refinance into loans with lower, affordable interest rates. *See id.*

29. Anthony B. Sanders, Bob Herberger Ariz. Heritage Chair Professor of Fin., Ariz. State Univ., Incentives and Failures in the Structured Finance Market: The Case of the Subprime Mortgage Market, Presentation to the Federal Reserve Bank of Cleveland Workshop: Structured Finance and Loan Modification (Nov. 20, 2007) (notes on file with author). *But cf.* Ruth Simon, *Rising Rates to Worsen Subprime Mess*, WALL ST. J., Nov. 24, 2007, at A1 (reporting that many mortgages defaulted even before interest rates increased).

were impaired.³⁰ Investors in these securities lost billions,³¹ creating a loss of confidence in the financial markets.³²

II. SEARCHING FOR LESSONS

A. IF DISCLOSURE PROVIDES INVESTORS WITH ALL THE INFORMATION NEEDED TO ASSESS INVESTMENTS, WHY DID SO MANY INVESTORS MAKE POOR DECISIONS?

To explain this anomaly and failure, this Essay examines several hypotheses:

***Hypothesis:* The disclosure was inadequate because the depth of the fall of the housing market exceeded reasonable worst-case scenarios. Mortgage loans, which were the asset class supporting the MBS as well as a significant portion of the CDO and ABS CDO securities, therefore, turned out to be severely undercollateralized in many cases.**

Any failure to envision the worst-case scenario that resulted from the fall of the housing market may have reflected, to some extent, a failure to take a sufficiently long view of risk. Some explain the near collapse of Long-Term Capital Management (LTCM), a hedge fund that lost hundreds of millions of dollars in 1998, as a result of this type of failure.³³ Investors and other market participants looked to the recent past to form predictions about home prices,³⁴ but they did not always look to worst-case possibilities, such as the experience of the Great Depression.³⁵

30. See Carrick Mollenkamp & Serena Ng, *Wall Street Wizardry Amplified Credit Crisis: A CDO Called Norma Left 'Hairball of Risk'; Tailored by Merrill Lynch*, WALL ST. J., Dec. 27, 2007, at A1 (reporting on the downgrade of one CDO's AAA rated tranches to junk status).

31. See *id.*

32. Reference in this article to "investors" means investors in capital market securities, not investors in the homes financed by the mortgage loans ultimately backing such securities.

33. See, e.g., Paul Krugman, *Rashomon in Connecticut: What Really Happened to Long-Term Capital Management?*, SLATE, Oct. 2, 1998, <http://www.slate.com/toolbar.aspx?action=print&id=1908>.

34. Jack Guttentag, *Shortsighted About the Subprime Disaster*, WASH. POST, May 26, 2007, at F2 (explaining that because housing prices had been rising for a long period of time, it was assumed that they would continue to rise).

35. See Christine Harper, *Death of VaR Evoked as Risk-Taking Vim Meets Taleb's Black Swan*, BLOOMBERG.COM, Jan. 28, 2008, <http://www.bloomberg.com/apps/news?pid=20601109&sid=axo1oswvqx4s&refer=home> (reporting that financial models at Merrill Lynch, Morgan Stanley, and UBS failed to foresee

These types of failures are inevitable, though, because the reasonableness of worst-case scenarios is assessed, necessarily, *ex ante*. It does not appear unreasonable, for example, to have viewed the Great Depression as unique.³⁶ As Monty Python memorably put it (in a different context), “Nobody expects the Spanish Inquisition!”³⁷

Some failures to take a sufficiently long view of risk reflect behavioral bias due to associations with recent similar events.³⁸ Those failures are discussed separately.

Hypothesis: The disclosure was adequate, but many investors failed to read it carefully enough or appreciate what they were reading.

the decline in housing prices). *See generally* NASSIM TALEB, *THE BLACK SWAN: THE IMPACT OF THE HIGHLY IMPROBABLE* (2007) (discussing human tendency of failing to anticipate improbable events). One commentator suggests that the disclosure also did not adequately address the relatively illiquid nature of the securities: “It is true that the level of default was unusually high, but the bulk of the problem is coming from liquidity issues—no one wants to hold these [securities], and if you try to find [a buyer] you have to trade them at a very low price.” E-mail from Richard Bookstaber, author, *A DEMON OF OUR OWN DESIGN*, to author (Nov. 30, 2007, 08:11:08 EST) (on file with author). Lack of liquidity, however, appears to have been a standard disclosure item. *See, e.g.*, Soundview Home Loan Trust, Prospectus Supplement (WMC1) (Mar. 12, 2007), available at <http://www.secinfo.com/dqTm6.uPa.htm>:

There is no assurance that . . . a secondary market [in the securities] will develop or, if it develops, that it will continue. Consequently, you may not be able to sell your [securities] readily or at prices that will enable you to realize your desired yield. The market values of the [securities] are likely to fluctuate; these fluctuations may be significant and could result in significant losses to you.

Id. at “Lack of Liquidity” subsection under “Risk Factors.” I therefore believe that the problem was less issuer failure to disclose the illiquidity risk than investor failure to appreciate that disclosure. *See infra* notes 38–51 and accompanying text. Query, however, whether anyone knew—much less knew enough to disclose—the extent of the illiquidity problem. *See* E-mail from Bookstaber, *supra* (“[N]o one knew how levered [sic] funds were, and therefore how quickly they would need to dump [securities] if they faced a market shock.”).

36. *But cf.* Atif Mian & Amir Sufi, *The Consequences of Mortgage Credit Expansion: Evidence from the 2007 Subprime Mortgage Default Crisis* 1, 4 (Nat’l Bureau of Econ. Research, Working Paper No. 13936), available at <http://www.nber.org/papers/w13936> (arguing that investors and rating agencies likely did not fully appreciate that the mortgage supply expansion itself was in part driving house price appreciation). In other words, Professors Mian and Sufi argue that home prices dropped radically, as a percentage, once mortgage money tightened, and that investors and rating agencies should have anticipated that possibility. *See id.*

37. *Monty Python’s Flying Circus: The Spanish Inquisition* (BBC television broadcast Sept. 22, 1970).

38. *See infra* notes 48–51 and accompanying text (discussing herd behavior and the availability heuristic).

This hypothesis has several possible subhypotheses explaining the ultimate failure. The first is overreliance: investors may have relied heavily, and perhaps in some cases exclusively, on third parties, in making important investment decisions. For example, one commentator argues that investors overrelied on the underwriter or arranger selling them the securities:

Investors have the prospectus to rely on, but the reality is that they have not taken any responsibility for reading the detail of the documentation or digesting the risks involved. These investors are still under the impression that the arranger will look after their interests and are yet to appreciate the need to negotiate what are highly complicated bilateral agreements.³⁹

Because this interpretation of investor behavior flies in the face of *caveat emptor* (“buyer beware”), it seems dubious that investors would depend so heavily on sellers of securities, unless the underwriter/arranger’s interests were aligned with that of the investors.⁴⁰ Those interests were somewhat aligned, however, in ABS CDO transactions where underwriters customarily purchased some portion of the equity tranches, at least in part, to demonstrate their (subsequently unjustified) confidence in the securities being sold. Ironically, this created a mutual-misinformation problem: aligning the interests of sellers and investors actually worked against investor caution.

Investors also may have overrelied on rating-agency ratings, without necessarily engaging in, or at least fully performing, their own due diligence.⁴¹ Even if investors performed their own due diligence, agency-cost conflicts⁴² and lack of economy of scale⁴³ may have limited the extent to which they could have done a better job of assessing creditworthiness than the rating agencies.

39. Daniel Andrews, *The Clean Up: Investors Need Better Advice on Structured Finance Products*, 26 INT’L FIN. L. REV. 14 (2007), <http://search.ebscohost.com/login.aspx?direct=true&db=buh&AN=26885198&site=ehost-live>.

40. This form of the hypothesis, of course, is now even more dubious as a predictor of (at least near-term) future investor reliance.

41. This Essay later examines why rating agencies failed to anticipate the downgrades. See *infra* Part II.E.

42. See *infra* notes 59–63 and accompanying text.

43. Individual investors face relatively high costs to assess the creditworthiness of complex ABS, CDO, and ABS CDO securities, whereas rating agencies make this assessment on behalf of many individual investors, thereby achieving an economy of scale. See *infra* notes 52–53 and accompanying text (discussing the complexity of these types of transactions and the volume of associated disclosure documents).

Another subhypothesis is that, as a result of a market bubble, “many investors, swept up in the euphoria of the moment, failed to pay close attention to what they were buying.”⁴⁴ Bubbles can start quite easily. If, for example, a particular stock unexpectedly gains in value, the losers (e.g., those shorting the stock) will tend to withdraw from that market, and the winners will tend to increase their investment, driving up the price even further. Soon, other winners are attracted to the stock, and other losers cut their losses and stop shorting the stock. This process is aided by commentators’ explanations of why it is rational for the price to keep going up, and why the traditional relationship of price to earnings does not apply. Even investors who recognize the bubble as irrational may buy in, hoping to sell at the height of the bubble before it bursts.⁴⁵ In these ways, price movements can become somewhat self-sustaining.⁴⁶

Bubbles are an old phenomenon. Compare the “tulip bubble” in seventeenth century Holland, in which certain tulips were highly prized, and their bulbs were sold for thousands of guilder. Almost everyone got caught up in the excitement of buying and selling tulip bulbs, usually on credit and with the intention of making a quick profit; but many who speculated on credit were left with crushing debts when the market finally crashed.⁴⁷ Occasional bubbles may well be an inevitable side effect of a market economy.

A third subhypothesis explaining investor actions is the notion of bounded rationality imposed by human cognitive limitations. Bubbles do not necessarily require individual investors to behave irrationally. In contrast, investors can make poor decisions, notwithstanding disclosure, because of their cognitive limitations. There are at least two ways in which this can occur. To some extent, investor failure in the subprime financial crisis may have resulted from herd behavior.⁴⁸ It may also have

44. Alan S. Blinder, *Six Fingers of Blame in the Mortgage Mess*, N.Y. TIMES, Sept. 30, 2007, § 3 (Business), at 4.

45. See Sam Segal, *Tulips Portrayed: The Tulip Trade in Holland in the 17th Century*, in THE TULIP 17–19 (Michael Roding & Hans Theunissen eds., 1993) (noting that all levels of the population from the weaver to the aristocrat were buying tulips at staggering prices in hopes of making a profit from the “tulip mania”).

46. RICHARD BOOKSTABER, A DEMON OF OUR OWN DESIGN: MARKETS, HEDGE FUNDS, AND THE PERILS OF FINANCIAL INNOVATION 169–70 (2007).

47. Segal, *supra* note 45, at 19.

48. Cf. Steven L. Schwarcz, *Rethinking the Disclosure Paradigm in a World of Complexity*, 2004 U. ILL. L. REV. 1, 14–15 (observing and explaining this behavior in a related context).

resulted from the availability heuristic, under which people overestimate the frequency or likelihood of an event when examples of, or associations with, similar events are easily brought to mind.⁴⁹ People typically overestimate the divorce rate, for example, if they can quickly find examples of divorced friends.⁵⁰ Similarly, once past financial crises recede in memory, and investors are making money, investors always “go for the gold.”⁵¹

Hypothesis: The disclosure was inherently inadequate because the transactions were so complex that many investors could not understand them.⁵²

This hypothesis turns on the extraordinary complexity of CDO and ABS CDO transactions. The prospectus itself in a typical offering of these securities can be hundreds of pages long.⁵³ This hypothesis, if true, would extend the thesis in my article, *Rethinking the Disclosure Paradigm in a World of Complexity*,⁵⁴ beyond investors in an Originator’s⁵⁵ securities to investors in an SPV’s securities. Although that article concerned investors in an Originator’s securities, the proposal of that article nonetheless can help to inform this analysis. That

49. Paul Slovic et al., *Facts Versus Fears: Understanding Perceived Risk*, in JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 463, 465 (Daniel Kahneman et al. eds., 1982).

50. *Id.*

51. Cf. Larry Light, *Bondholder Beware: Value Subject to Change Without Notice*, BUS. WK., Mar. 29, 1993, at 34 (discussing that within years after the “Marriott split,” investors favor higher interest rates over “event risk” covenants, once the examples of events justifying the covenants have receded in memory). “Bondholders can—and will—fuss all they like. But the reality is, their options are limited: Higher returns or better protection. Most investors will continue to go for the gold.” *Id.*

52. See, e.g., Aaron Lucchetti & Serena Ng, *Credit & Blame: How Rating Firms’ Calls Fueled Subprime Mess*, WALL ST. J., Aug. 15, 2007, at A10 (“A lot of institutional investors bought [mortgage-backed] securities substantially based on their ratings [without fully understanding what they bought], in part because the market has become so complex.”); see also Blinder, *supra* note 44 (arguing that the MBS, especially the CDOs, “were probably too complex for anyone’s good”); Malcolm Gladwell, *Open Secrets: Enron, Intelligence, and the Perils of Too Much Information*, NEW YORKER, Jan. 8, 2007, at 44–53 (distinguishing between transactions that are merely “puzzles” and those that are truly “mysteries”). To the extent complexity is merely a puzzle, investment bankers theoretically could understand it. See *id.* at 46 (stating why puzzles are easier to solve than mysteries).

53. The disclosure documents ordinarily consist of a prospectus and a prospectus supplement, each close to 200 pages long.

54. Schwarcz, *supra* note 48, at 7.

55. For a definition of “Originator,” see *supra* note 24.

article proposes that investors in an Originator's securities be protected in a supplementary manner by restricting conflicts of interest in complex transactions for which disclosure would be insufficient.⁵⁶ The rationale is that, absent conflicts, the Originator's management will make decisions that more closely reflect the interests of the Originator's investors.

The same approach has potential application to investors in an SPV's securities, particularly when the SPV transaction is so complex (as some CDO and ABS CDO transactions apparently were) that disclosure would be insufficient. In that context, there are at least two ways in which material conflicts arise. For securities backed by subprime mortgages, the interests of mortgage originators, absent their taking a prior or *pari passu* ("equal and ratable") risk of loss,⁵⁷ are misaligned with that of investors in those securities.⁵⁸ To mitigate this type of conflict, perhaps mortgage originators should be required to take some risk of loss.

Secondly, agency-cost conflicts arise when the interests of individual investment bankers, who structure, sell, or invest in securities, are misaligned with the interests of the institutions for which they work.⁵⁹ For example, certain losses of institutional investors such as Bear Stearns appear to have resulted from losses in CDO investments by controlled or managed hedge funds.⁶⁰ If managers of those hedge funds were paid according to hedge-fund industry custom—in which "fund managers reap large rewards on the upside without a corresponding punitive downside"⁶¹—they would have had significant conflicts

56. Schwarcz, *supra* note 48, at 30. *See also id.* at 32–33 (showing how to identify these transactions, which are defined as "disclosure-impaired transactions").

57. If mortgage originators take a risk of loss prior to, or *pari passu* (i.e., equal and ratable) with, investor risk of loss, their incentives would be aligned with investor incentives.

58. *See infra* notes 70–83 and accompanying text.

59. Most investors were institutions. *See* SEC. & EXCH. COMM'N, STAFF REPORT: ENHANCING DISCLOSURE IN THE MORTGAGE-BACKED SECURITIES MARKETS (2003), <http://www.sec.gov/news/studies/mortgagebacked.htm> (reporting that investors in MBS are "overwhelmingly institutional").

60. *See, e.g.*, Kate Kelly et al., *Two Big Funds At Bear Stearns Face Shutdown*, WALL ST. J., June 20, 2007, at A1.

61. James Surowiecki, *Performance-Pay Perplexes*, NEW YORKER, Nov. 12, 2007, at 34. Hedge funds sometimes impose a limited punitive downside by ensuring that managers who lose money may not receive future bonuses until they subsequently make money above a "high water mark." MARK J. P. ANSON, THE HANDBOOK OF ALTERNATIVE ASSETS 361 (2002). Generally, however, there is no clawback of past bonuses, so these managers can go to another

of interest with the institutions owning the hedge funds.⁶² To mitigate this type of conflict, these individuals should be paid in a manner that better aligns their interests with the interests of the institutions for which they work.

Restricting conflicts of interest, as a supplement to disclosure, is only a second-best solution. It would not solve the problem that, even absent conflicts, individual investment bankers might have insufficient incentives to try to completely understand the highly complex transactions in which they recommend their institutions invest. For example, such individuals might not choose to fully comprehend complex transactions because they view the possibility of losses as remote, or anticipate being in a new job if and when losses occurred, or simply feel safe following the herd of other bankers.⁶³

There do not appear to be any perfect solutions to the problem of investor ignorance of complex transactions. Government already takes a somewhat paternalistic stance to mitigate disclosure inadequacy by mandating minimum investor sophistication for investing in complex securities; yet sophisticated investors and qualified institutional buyers (QIBs) are the very investors who lost the most money in the subprime financial crisis.⁶⁴ And any attempt by government to restrict firms from engaging in complex transactions would be highly risky because of the potential of inadvertently banning beneficial transactions.⁶⁵

hedge fund where they will not be subject to this liability. *Id.* at 85 (“[C]lawbacks are rare in the hedge fund world.”).

62. In this regard, the reader should distinguish these conflicts of interest not only from the agency-cost problem discussed above but also from the potential conflict of interest between mortgage originators and investors discussed in footnotes 70–83 and accompanying text.

63. *See, e.g.*, Schwarcz, *supra* note 48, at 2, 14–15. Outside of an institutional-industry context, there may be further misalignment of incentives because of higher employee turnover. *Id.* at 14 (observing that employee turnover reduces accountability).

64. *See, e.g.*, Jenny Anderson, *Wall St. Banks Confront a String of Write-Downs*, N.Y. TIMES, Feb. 19, 2008, at C1 (“[M]ajor banks . . . have already written off more than \$120 billion of losses stemming from bad mortgage-related investments.”); Randall Smith, *Merrill’s \$5 Billion Bath Bares Deeper Divide*, WALL ST. J., Oct. 6, 2007, at A4 (reporting a total of \$20 billion in write-downs by large investment banks).

65. *Cf. infra* note 74 and accompanying text (cautioning against “throwing out the baby with the bathwater”). Although otherwise beyond this article’s scope, certain CDO products, the so-called CDOs “squared” and “cubed,” might be worthy of special consideration because they are subject to “cliff risk,” or suddenly losing 100% of their value. *See, e.g.*, MICHIKO WHETTEN & MARK ADELSON, NOMURA FIXED INCOME RESEARCH, CDOS-SQUARED DEMYSTIFIED

***Hypothesis:* Even when disclosure is adequate and investors understand it perfectly (i.e., they have perfect knowledge of the risk), disclosure alone will be inadequate to address at least systemic risk in financial markets.**

Systemic risk is the risk that an economic shock such as market or institutional failure triggers (through a panic or otherwise) either by (i) the failure of a chain of markets or institutions or (ii) a chain of significant losses to financial institutions, resulting in increases in the cost of capital or decreases in its availability, often evidenced by substantial financial-market price volatility.⁶⁶ Disclosure alone will be inadequate to prevent systemic risk because, like a tragedy of the commons, the benefits of exploiting finite capital resources accrue to individual market participants, each of whom is motivated to maximize use of the resource, whereas the costs of exploitation, which affect the real economy, are distributed among an even wider class of persons.⁶⁷ Investors are therefore unlikely to care about disclosure to the extent it pertains to systemic risk.

Should disclosure therefore be supplemented to address systemic risk? I address this in a separate article,⁶⁸ proposing, among other things, a “market” liquidity provider of last resort to purchase securities in collapsing markets in order to mitigate market instability that would lead to systemic collapse. Such a liquidity provider would supplement disclosure by making its purchases at a deep enough discount to (i) make a profit, or at least be repaid, and (ii) mitigate moral hazard by impairing speculative investors.⁶⁹

12–13 (2005), http://www.math.ust.hk/~maykwok/courses/MAFS521_07/CDO-Squared_Nomura.pdf; Janet Tavakoli, *Leverage and Junk Science: A Credit Crunch Cocktail*, TOTAL SECURITIZATION, Sept. 20, 2007, <http://www.totalsecuritization.com>. In this context, the tort law doctrine of “unavoidably unsafe products” may help to inform a regulatory analysis. In tort law, an “unavoidably unsafe product” is subject to strict liability unless its utility outweighs its risk. Joanne Rhoton Galbreath, Annotation, *Products Liability: What Is an “Unavoidably Unsafe” Product*, 70 A.L.R. 4th 34 (1989). For example, the vaccine for rabies is inherently dangerous, but rabies can result in death, so the vaccine is not subject to strict liability. RESTATEMENT (SECOND) OF TORTS § 402A cmt. k (1965).

66. See Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L.J. 193, 196–97 (2008).

67. In other words, the externalities of systemic failure include social costs that can extend far beyond market participants. *Id.* at 208–09.

68. See *id.* at 228–30, 248–49.

69. *Id.*

Summary: The discussion above suggests that multiple causes, viewed collectively, explain why so many investors make poor investment decisions notwithstanding disclosure. Some investors may have taken too short-sighted a view of risk in the housing market or have been swayed by the fact that, in recent memory, home prices had only been rising. Some investors may have simply followed the herd in their investments, while others—possibly recognizing the bubble forming in the market for CDO and ABS CDO securities—may have invested anyway, hoping prices would continue to rise and their investments would rise in value. Investors also may have relied excessively on credit ratings without performing their own due diligence. In the case of investments in ABS CDO transactions, investors additionally may have over-relied on the judgment of underwriters who had purchased portions of the “equity” tranches. Finally, certain of the CDO and ABS CDO transactions may have been so complex that disclosure was inherently inadequate.

B. IS THERE SOMETHING STRUCTURALLY WRONG ABOUT HOW STRUCTURED FINANCE WORKED IN THE MORTGAGE CONTEXT?

For this anomaly, this Essay examines several hypotheses:

***Hypothesis:* Structured finance facilitated an undisciplined mortgage lending industry characterized by ease of entrance by enabling mortgage lenders to sell off loans as they were made (a concept called “originate-and-distribute”). This created moral hazard to the extent that mortgage lenders did not have to live with the credit consequences of their loans. For that reason, probably exacerbated by the fact that mortgage lenders could make money on the volume of loans originated,⁷⁰ the underwriting standards of mortgage lenders fell.⁷¹**

70. This may have been further exacerbated by certain mortgage lenders without balance-sheet assets simply advancing to borrowers the proceeds of selling the loans. Confidential Interview with a monoline insurance executive (Oct. 18, 2007) (notes on file with author).

71. See, e.g., *Legislative and Regulatory Options for Minimizing and Mitigating Mortgage Foreclosures: Hearing Before the H. Comm. on Financial Serv.*, 110th Cong. 74 (2007) (statement of Ben S. Bernanke, Chairman, Board of Governors, Fed. Reserve System). There is also speculation that some mortgage-loan originators might have engaged in fraud by manipulating borrower income, and that some borrowers may have engaged in fraud by lying about their income, in each case to qualify borrowers for loans. See, e.g., Vikas Bajaj, *A Cross-Country Blame Game*, N.Y. TIMES, May 8, 2007, at C4. If such fraud occurred, it would exacerbate but is unlikely to be significant enough to have

Anecdotal evidence suggests this hypothesis is at least somewhat true.⁷² One solution would be to limit the originate-and-distribute model.⁷³ However, that would be like “throwing out the baby with the bathwater” as an originate-and-distribute model is critical to the underlying funding liquidity of banks⁷⁴ as well as many corporations.⁷⁵

A better solution, already discussed, would be to require mortgage lenders and other originators to retain a risk of loss.⁷⁶ In many nonmortgage securitization transactions, for example, it is customary for originators to bear a direct risk of loss by overcollateralizing the receivables sold to the SPV.⁷⁷ This is not always done in mortgage securitization because mortgage loans are inherently overcollateralized by the value of the real-estate collateral, and thus investors can effectively be overcollateralized even if the originator bears no risk of loss. However, originators should be required to retain a risk of loss to mitigate moral hazard. In this context, one might ask why investors and other parties, such as credit insurers, who ultimately bear the risk of loss in an originate-and-distribute model do not monitor the underlying loans. Although in theory they should, the prac-

caused the subprime financial crisis.

72. See Gary B. Gorton, *The Panic of 2007*, at 68 (Nat'l Bureau of Econ. Research, Working Paper No. 14358, 2008), available at <http://www.nber.org/papers/w14358.pdf> (stating that the originate-and-distribute model and resulting moral hazard are the “dominant explanation” for the financial panic). To some extent, the drop in underwriting standards under the originate-and-distribute model may reflect distortions caused by the recent liquidity glut, in which lenders competed aggressively for business and allowed otherwise defaulting borrowers to refinance. See Ravi Balakrishnan et al., *Globalization, Gluts, Innovation or Irrationality: What Explains the Easy Financing of the U.S. Current Account Deficit?* 5 (Int'l Monetary Fund, Working Paper No. 07/160, 2007), available at <http://www.imf.org/external/pubs/ft/wp/2007/wp07160.pdf> (discussing this liquidity glut).

73. This model is also referred to as “originate to distribute.”

74. See, e.g., Joseph R. Mason, Assoc. Professor of Fin. & LeBow Research Fellow, Lebow Coll. of Bus., Drexel Univ., Presentation to the Federal Reserve Bank of Cleveland: Mortgage Loan Modification: Promises and Pitfalls (Nov. 20, 2007) (presentation notes on file with author) (showing that fifty-eight percent of mortgage liquidity in the United States, and seventy-five percent of mortgage liquidity in California has come from structured finance).

75. See Xudong An et al., *Value Creation Through Securitization: Evidence from the CMBS Market* 3 (SSRN Working Paper No. 1095645, 2008), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1095645 (concluding that despite the recent mortgage crisis, securitization has created value in the financial markets).

76. See *supra* text accompanying notes 57–58.

77. See Vincent Ryan, *Debt in Disguise*, CFO MAG., Nov. 2007, at 80 (reporting that most securitization agreements include overcollateralization).

tical limits suggested by this Essay—including complexity of disclosure, herd behavior, and, as will be discussed, possible excessive diversification of risk that undermines any given investor’s incentive to monitor⁷⁸—help to explain this failure to monitor.⁷⁹

Some investors take comfort in the limited risk of loss imposed on mortgage originators through representations and warranties.⁸⁰ Representations and warranties, however, are not always effective because they are costly to enforce and become illusory when mortgage originators are unable, as in the current subprime mortgage meltdown, to pay damages for breach.⁸¹ Prudent investors should insist that mortgage originators retain some direct risk of loss to mitigate moral hazard.⁸² For this same reason, for example, banks buying loan participations insist that the bank originating the loan retain a minimum portion, typically at least ten percent of the loan exposure, even if the loan itself is overcollateralized.⁸³

Another possible solution is to regulate the loan underwriting standards applicable to mortgage lenders. This approach would be akin to the Federal margin regulations G, U, T, and X imposed in response to the 1929 stock market crash.⁸⁴ The

78. See *infra* notes 87–89 and accompanying text.

79. The failure to monitor also can be explained by systematic underestimation of the risk by all market players. See, e.g., Oz Ergungor, *The Mortgage Debacle and Loan Modification* 7–8 (2008) (unpublished manuscript, on file with author).

80. Sanders, *supra* note 29.

81. Cf. *id.* (arguing that mortgage originators be required to post capital to backstop their representations and warranties for loans originated and then sold). Representations and warranties are even more patently illusory for mortgage originators lacking assets, who simply advance to borrowers the proceeds of selling the loans. See *supra* note 70.

82. The market actually was beginning to adjust in this fashion shortly before the subprime mortgage crisis started. See Jon D. Van Gorp, *Capital Markets Dispersion of Subprime Mortgage Risk* 10 (Nov. 2007) (unpublished manuscript, on file with author) (observing that, at the beginning of 2007, “early payment default protection became standardized across the market,” requiring loan originators to repurchase loans that fail to make any of their first two or three scheduled payments). Obligations to repurchase can become ineffective, however, when so many loans default that the obligor is unable to make its required repurchases. Ergungor, *supra* note 79, at 4–5.

83. In the author’s experience, this observation is accurate. Cf. Blinder, *supra* note 44 (suggesting that mortgage-loan originators “retain a share of each mortgage”); *supra* notes 40–41 and accompanying text (discussing underwriters retaining a portion of the equity when selling ABS CDO securities).

84. Cf. Blinder, *supra* note 44 (suggesting a “suitability standard” for selling mortgage products and that all mortgage lenders be placed under federal

then-falling stock values caused margin loans—that is, loans to purchase publicly listed, or margin stock—to become undercollateralized, causing bank lenders to fail. To protect against a recurrence of this problem, the margin regulations require margin lenders to maintain two-to-one overcollateralization when securing their loans by margin stock that has been purchased, directly or indirectly, with the loan proceeds.⁸⁵

Imposing a minimum real-estate-value-to-loan overcollateralization on all mortgage loans secured by the real estate financed would likewise protect against a repeat of the subprime mortgage problem. Unfortunately, though, it would have a high price, potentially impeding and increasing the cost of home ownership and imposing an administrative burden on lenders and government monitors.⁸⁶

***Hypothesis:* Structured finance dispersed subprime mortgage risk so widely that there was no clear incentive for any given investor to monitor it.**

regulation).

85. 12 C.F.R. § 221.3 (2008).

86. One might also consider imposing lending “suitability” standards and predatory-lending restrictions. For example, North Carolina’s Home Loan Protection Act, among other things, mandates that lenders verify borrower income and also review the borrower’s ability to repay the loan after introductory rates adjust upwards. N.C. GEN. STAT. § 24-1.1E (2007) (amended by 2008 N.C. Sess. Laws). The U.S. Congress also has considered mortgage suitability standards and anti-predatory-lending restrictions. *See, e.g.*, Mortgage Reform and Anti-Predatory Lending Act, H.R. 3915, 110th Cong. (2007). There is dispute, however, over whether the North Carolina law has negatively impacted home ownership. *Compare* Raphael W. Bostic et al., *State and Local Anti-Predatory Lending Laws: The Effect of Legal Enforcement Mechanisms*, 60 J. ECON. & BUS. 47, 50 (2008) (lending evidence that anti-predatory-lending laws have not curtailed credit mortgage markets), *and* Nanette Byrnes, *These Tough Lending Laws Could Travel*, BUS. WK., Nov. 5, 2007, at 70 (reporting that North Carolina’s housing market has not, according to “academic studies,” been negatively impacted), *and* ROBERTO G. QUERCIA ET AL., CTR. FOR COMMUNITY CAPITALISM, THE IMPACT OF NORTH CAROLINA’S ANTI-PREDATORY LENDING LAW: A DESCRIPTIVE ASSESSMENT (2003), http://www.planning.unc.edu/pdf/CC_NC_Anti_Predatory_Law_Impact.pdf (stating that since the law was passed, there has been a reduction in predatory loans, but there has been “no change in the cost of subprime credit or reduction in access to credit for high-risk borrowers”), *with* Byrnes, *supra* (reporting that groups such as the Mortgage Bankers Association argue that tough loan underwriting standards will prevent needy borrowers from obtaining mortgage loans). Some argue also that the “borrowers are not victims of inappropriate loan prospecting (such as predatory lending). Rather, they [or, at least, many] were willful participants.” Sanders, *supra* note 29. *But cf.* Gretchen Morgenson, *Blame the Borrowers? Not So Fast*, N.Y. TIMES, Nov. 25, 2007, § 3 (Business), at 1.

Structured finance generally diversifies and reallocates risk, which is normally salutary.⁸⁷ Might it have excessively dispersed subprime risk?⁸⁸

If this hypothesis is true, it would call into question whether incentives should be better aligned to promote monitoring, for example, by limiting the degree of risk dispersion. To some extent, this article already proposes a variant on that approach, by suggesting that loan originators in an originate-and-distribute model retain some minimum percentage or amount of risk.⁸⁹

***Hypothesis:* Structured finance can make it difficult to work out problems with an underlying asset class—in this case, for example, making it difficult to work out the underlying mortgage loans because the beneficial owners of the loans are no longer the mortgage lenders but a broad universe of financial-market investors. As a result, mortgage defaults result in unnecessarily high losses.**

News stories observe that homeowners have been unable to restructure or modify their loans because they cannot identify who owns the loans.⁹⁰ Laws protecting mortgage borrowers,

87. Douglas Elmendorf, *Notes on Policy Responses to the Subprime Mortgage Unraveling*, BROOKINGS INST., at 9 n.6, Sept. 17, 2007, http://www.brookings.edu/~media/Files/rc/papers/2007/09subprimemortgageunravelling/09useconomics_elmendorf.pdf; see also Darrell Duffie, *Innovations in Credit Risk Transfer: Implications for Financial Stability* 1–2 (Bank for Int'l Settlements, Paper No. 255, 2008), available at <http://www.bis.org/publ/work255.pdf?noframes=1> (arguing that instruments that transfer credit risk improve financial stability by dispersing risk among investors).

88. The very assumption that structured finance reallocates risk to parties best able to bear it also may have failed in the subprime context. E-mail from Bookstaber, *supra* note 35 (“Rather than spreading the risk to those who were most comfortable holding the assets and taking the risk, many of the [holders] were ‘hot money’ hedge funds that would have to run for cover at the very time the risk taking function was most critical.”).

89. See *supra* text accompanying note 82 (arguing that prudent investors should insist that mortgage originators retain some direct risk of loss to mitigate moral hazard).

90. Gretchen Morgenson, *More Home Foreclosures Loom as Owners Face Mortgage Maze*, N.Y. TIMES, Aug. 6, 2007, at A1. A somewhat related issue is that, at least heretofore, individual borrowers could not use Chapter 13 bankruptcy to restructure their home mortgage-loan liabilities. See 11 U.S.C. §§ 1322(b)(2), 1332(b)(5) (2006). Bills have been introduced into both houses of Congress to amend Chapter 13 and allow for restructuring of home mortgages by bankruptcy courts. See Emergency Home Ownership and Mortgage Equity Protection Act of 2007, H.R. 3609, 110th Cong. (2007); Helping Families Save their Homes in Bankruptcy Act of 2008, S. 2136, 110th Cong. (2008). In a corporate-reorganization context, however, debtors can, with the lender’s consent,

however, suggest this concern may be overstated. For example, the federal Truth in Lending Act states that, “[u]pon written request by the obligor, the servicer shall provide the obligor, to the best knowledge of the servicer, with the name, address, and telephone number of the owner of the obligation or the master servicer of the obligation.”⁹¹

In theory, servicers bridge the gap between beneficial owners of the loans and the mortgage lenders. It is typical, for example, for originators of securitized mortgage loans, or a specialized servicing company such as Countrywide Home Loans Servicing LP, to act as the servicer for a fee.⁹² In this capacity, the servicer ordinarily retains power to restructure the underlying loans, so long as restructuring changes are “in the best interests” of the investors holding the securities.⁹³ Subject to that constraint, the servicer may even change the rate of interest, the principal amount of the loan, or the maturity dates of the loan if, for example, the loan is in default or, in the servicer’s judgment, default is reasonably foreseeable.⁹⁴

In practice, though, even when a servicer has the power to restructure a mortgage loan and restructuring is in the best interests of investors, the servicer may be reluctant to engage in

use bankruptcy to restructure their secured-loan liabilities. *Cf.* 11 U.S.C. § 1123(a)(5) (2006) (listing the contents of a bankruptcy plan); § 1126(c) (acceptance of a bankruptcy plan); § 1129(a)(7)–(8) (confirmation of a bankruptcy plan).

91. 15 U.S.C. § 1641(f)(2) (2006). Identification would be even less of a problem if the underlying receivables are not consumer assets, like mortgage loans, since the amounts involved in consumer receivables are typically relatively small.

92. *See* JAMES A. ROSENTHAL & JUAN M. OCAMPO, SECURITIZATION OF CREDIT 49–51 (1988) (explaining the general structure of a grantor trust when the originator of asset-backed securities services the pool of assets); Gretchen Morgenson, *Countrywide Is Upbeat Despite Loss*, N.Y. TIMES, Oct. 27, 2007, at C1 (reporting that Countrywide is the nation’s largest loan servicer). In addition to a primary servicer, there are often other servicers involved in MBS transactions including a specialized servicer who services defaulted mortgage loans. *See* Mortgage Bankers Ass’n, Presentation to the Securities and Exchange Commission on the Proposed Asset-Backed Securities Rule (Sept. 23, 2004), available at www.sec.gov/rules/proposed/s72104/mba092304.ppt.

93. Morgenson, *supra* note 90 (observing that a servicer might, for example, be permitted to restructure only five percent of the loans). Sometimes, however, the servicer is limited as to the percentage of loans in a given pool that can be restructured. *Id.*

94. Financial Asset Securities Corp., Pooling and Service Agreement for Soundview Home Loan Trust Asset-Backed Certificates § 3.01 (Mar. 1, 2007), available at http://www.sec.gov/Archives/edgar/data/1386634/000088237707001029/d650626ex4_1.htm.

restructuring if there is uncertainty that the transaction will generate sufficient excess cash flow to reimburse the servicer's costs.⁹⁵ A mortgage loan servicer, for example, must "spend \$750-\$1000 to do a [loan] mod[ification] [and] can't charge the borrower."⁹⁶ If there is insufficient excess cash, neither can it charge the securitization trust.⁹⁷ By contrast, "all foreclosure costs are reimbursed."⁹⁸ Servicers also may sometimes prefer foreclosure over restructuring because the former is more ministerial and thus has lower litigation risk.⁹⁹ The litigation risk of restructuring is exacerbated by the fact that, in many MBS, CDO, and ABS CDO transactions, cash flows deriving from principal and interest are separately allocated to different investor tranches.¹⁰⁰ Therefore, a restructuring that, for example, reduces the interest rate would adversely affect investors in the interest-only tranche,¹⁰¹ leading to what some have called "tranche warfare."¹⁰²

Summary: The discussion above indicates there is little structurally wrong about how structured finance worked in the mortgage context. Although the originate-and-distribute model of structured finance may have created a degree of moral hazard, the model is critical to underlying funding liquidity. Moreover, the moral hazard cost can be mitigated if, as likely will occur in the future, investors learn from the subprime crisis and require mortgage originators to retain a direct risk of loss beyond the sometimes illusory risk borne through representations and warranties.

95. Mason, *supra* note 74 (observing that servicers will prefer to foreclose, even if it is not the best remedy, when foreclosure costs, but not modification costs, are reimbursed).

96. *Id.*

97. *Id.*

98. *Id.*

99. Kathleen C. Engel, Assoc. Professor of Law, Cleveland-Marshall Coll. of Law, Presentation to the Federal Reserve Bank of Cleveland: Modifications of Loans in Securitized Pools: Obstacles and Options (Nov. 20, 2007) (notes on this presentation on file with author).

100. Van Gorp, *supra* note 82, at 7-8.

101. The conflicts among tranches can become even more complicated because subprime MBS, CDO, and ABS CDO securities sometimes also include prepayment-penalty tranches, and the different tranches "have different priorities relative to one another for the purpose of absorbing losses and prepayments on the underlying subprime mortgage loans." *Id.* at 8.

102. Telephone Interview with Alan Hirsch, Dir., N.C. Policy Office (Feb. 20, 2008) (describing tranche conflicts as a significant reason why servicers choose foreclosure over restructuring).

Structured finance can make it more difficult to address problems with the underlying financial assets, but the increased difficulty may be able to be managed. Parties should consider writing underlying deal documentation that sets clearer and more flexible guidelines and more certain reimbursement procedures for loan restructuring, especially when such restructuring is superior to foreclosure.¹⁰³ Investors (and servicers) should prefer foreclosure to restructuring if restructuring merely delays an inevitable foreclosure.¹⁰⁴

There nonetheless is a residual structural concern insofar as structured finance may have dispersed subprime mortgage risk so widely that there is no clear incentive for any given investor to monitor the risk. Whether that has occurred is uncertain. Even if it has, the evil is not so much risk dispersion per se as the failure to align incentives sufficiently to promote monitoring.

C. WHY DID A PROBLEM WITH THE SUBPRIME MORTGAGE-BACKED SECURITIES MARKETS QUICKLY INFECT THE MARKETS FOR PRIME MORTGAGE-BACKED SECURITIES AND OTHER ASSET-BACKED SECURITIES?¹⁰⁵

Understanding this anomaly can help to expand an understanding of how market risk can become systemic. For this anomaly, this Essay examines several hypotheses:

Hypothesis: The MBS, ABS, CDO, and ABS CDO markets are inherently tightly coupled, both within and among such markets.

103. In the current subprime crisis, of course, the underlying deal documentation is already in place. Because existing documentation cannot be easily renegotiated, the government might consider legislating changes. Any such changes that are subsidized in whole or part by government, however, could foster moral hazard, potentially making future homeowners more willing to take risks when borrowing.

104. Engel, *supra* note 99.

105. Cf. Andrews, *supra* note 39 (observing from the subprime financial crisis that “liquidity in markets for structured investments can disappear immediately as soon as there are any shocks—no buying or selling at all in an entire sector,” though not explaining why this occurs). A somewhat related question might be why the U.S. domestic real estate collapse is having a significant impact overseas. The answer is that foreign investors purchased a significant amount of the CDO and ABS CDO securities backed (directly or indirectly) by such real estate. Jenny Anderson & Heather Timmons, *Why a U.S. Subprime Mortgage Crisis Is Felt Around the World*, N.Y. TIMES, Aug. 31, 2007, at C1.

By “tight coupling,” I mean the tendency for financial markets to move rapidly into a crisis mode with little time or opportunity to intervene.¹⁰⁶ Tight coupling could result from various mechanisms, even as elementary as investor panic, guilt-by-association, or loss of confidence.¹⁰⁷ In the subprime crisis, once investors realized that highly rated subprime mortgage-backed securities could lose money, they began shunning all complex securitization products.¹⁰⁸ This pattern of behavior was particularly true with respect to asset-backed commercial paper—not surprisingly, since commercial paper is effectively a substitute for cash (albeit one that yields a return). Investor reaction also may have been magnified by the dramatic shift away from the liquidity glut of the past few years, which had obscured the problem of defaults by enabling defaulting borrowers to refinance with ease.¹⁰⁹

Tight coupling also may have been caused by a type of adverse selection: investors were no longer sure which securitization investments or counterparties were good and which were bad (CDO and ABS CDO products being especially difficult to value¹¹⁰), so they stopped investing in all securitization products.¹¹¹ Incongruously, adverse selection may have been made

106. Thanks to Rick Bookstaber for this term. Bookstaber himself borrows it from engineering nomenclature. See *Systemic Risk Hearing*, *supra* note 2, at 8 (statement of Richard Bookstaber).

107. See, e.g., Paul Davies & Gillian Tett, ‘A Flight to Simplicity’: Investors Jettison What They Do Not Understand, *FIN. TIMES* (London), Oct. 22, 2007, at 9.

108. Cf. Markus K. Brunnermeier, *Deciphering the 2007-08 Liquidity and Credit Crunch*, 22 *J. ECON. PERSP.* (forthcoming Fall 2008), available at http://www.princeton.edu/~markus/research/papers/liquidity_crunch_2007_08.pdf (speculating that when investors realized how difficult it was to value mortgage-structured products, the volatility of all structured products increased).

109. Cf. *supra* note 72 and accompanying text (explaining that lenders competed aggressively for business during the recent liquidity glut, which allowed otherwise defaulting borrowers to refinance).

110. Many CDO and ABS CDO products are valued by models rather than market price because they are issued in private placements and not freely traded. Valuation models are imperfect because they are based on assumptions. See Floyd Norris, *Reading Write-Down Tea Leaves*, *N.Y. TIMES*, Nov. 9, 2007, at C1 (discussing the problems related to using valuation models). See generally Ingo Fender & John Kiff, *CDO Rating Methodology: Some Thoughts on Model Risk and its Implications* (Bank of Int’l. Settlements, Working Paper No. 163, 2004), available at <http://www.bis.org/publ/work163.htm> (discussing the problems associated with the valuation models used by rating agencies).

111. See, e.g., Zuckerman, *supra* note 8, at 63 (stating that the “credit system has been virtually frozen,” which poses a problem “since few people even know where the liabilities and losses are concentrated”).

worse by the otherwise salutary effect of securitization to disperse risk: investors were unable, in part exacerbated by the indirect holding system for securities under which third parties cannot readily determine who ultimately owns specific securities,¹¹² to ascertain to whom the risk was dispersed.

Finally, and incongruously, tight coupling can even result from mark-to-market, or “fair value,” accounting. In its simplest form, this is the common requirement that a securities account be adjusted in response to a change in the market value of the securities. An investor, for example, may buy securities on credit from a securities broker-dealer, securing the purchase price by pledging the securities as collateral. To guard against the price of the securities falling to the point where their value as collateral is insufficient to repay the purchase price, the broker-dealer requires the investor to maintain a minimum collateral value. If the market value of the securities falls below this minimum, the broker-dealer will issue a “margin call” requiring the investor to deposit additional collateral, usually in the form of money or additional securities, to satisfy this minimum. Failure to do so triggers a default, enabling the broker-dealer to foreclose on the collateral.¹¹³ Requiring investors to mark prices to market value in this fashion is generally believed to reduce risk.¹¹⁴ Nonetheless, it can cause “perverse effects on systemic stability” during times of market turbulence, when forcing sales of assets to meet margin calls can depress asset prices, requiring more forced sales (which, in turn, will depress asset prices even more), causing a downward spiral.¹¹⁵ The existence

112. Under the indirect holding system for securities, intermediary entities hold securities on behalf of investors. Issuers of the securities generally record ownership as belonging to one or more depository intermediaries, which in turn record the identities of other intermediaries, such as brokerage firms or banks, that buy interests in the securities. Those other intermediaries, in turn, record the identities of investors that buy interests in the intermediaries' interests. See Steven L. Schwarcz, *Intermediary Risk in a Global Economy*, 50 DUKE L.J. 1541, 1547–48 (2001). Because of this ownership chain, there is no single location from which third parties can readily determine who ultimately owns specific securities. *Id.* at 1583.

113. ZVI BODIE ET AL., *INVESTMENTS* 78–79 (6th ed. 2005).

114. See, e.g., Gikas A. Hardouvelis & Panayiotis Theodossiou, *The Asymmetric Relation Between Initial Margin Requirements and Stock Market Volatility Across Bull and Bear Markets*, 15 REV. FIN. STUD. 1525, 1554–55 (2002) (finding a correlation between higher margin calls and decreased systemic risk, and speculating that higher margin calls may bleed the irrationality out of the market until only sound bets are left).

115. See Rodrigo Cifuentes et al., *Liquidity Risk and Contagion*, BANK OF INTERNATIONAL SETTLEMENTS, at 2, Apr. 2, 2004, <http://www.bis.org/bcbs/>

of leverage makes this spiral more likely and amplifies it if it occurs.¹¹⁶ At least some portion of the subprime crisis appears to have been caused by this downward spiral.¹¹⁷

Hypothesis: Tight coupling resulted from convergence in hedge-fund quantitatively constructed investment strategies.¹¹⁸

Professors Khandani and Lo hypothesize that when a number of hedge funds experienced unprecedented losses during the week of August 6, 2007, they rapidly unwound sizable portfolios, likely based on a multistrategy fund or proprietary-trading desk.¹¹⁹ These initial losses then caused further losses by triggering stop/loss and de-leveraging policies.¹²⁰ To the extent this hypothesis has validity, hedge fund strategies, and not securitization or structured finance per se, are responsible for the subprime financial crisis.

Summary: The discussion above provides three explanations for why a problem with the subprime mortgage-backed securities markets quickly infected the prime markets.¹²¹ Faced

events/rtf04shin.pdf; see also Clifford De Souza & Mikhail Smirnov, *Dynamic Leverage: A Contingent Claims Approach to Leverage for Capital Conservation*, J. PORTFOLIO MGMT. 25, 28 (Fall 2004) (arguing that, in a bad market, short-term pressure to sell assets to raise cash for margin calls can lead to further mark-to-market losses for remaining assets, which triggers a whole new wave of selling, the process repeating itself until markets improve or the firm is wiped out; and referring to this process as a “critical liquidation cycle”).

116. De Souza & Smirnov, *supra* note 115, at 26–27.

117. Rachel Evans, *Banks Tell of Downward Spiral*, 27 INT’L FIN. L. REV. 16 (2008), <http://search.ebscohost.com/login.aspx?direct=true&db=buh&AN=33588387&site=ehost-live>.

118. Cf. Schwarcz, *supra* note 66, at 202–04 (discussing the danger of converging hedge-fund investment strategies).

119. Amir Khandani & Andrew W. Lo, *What Happened to the Quants in August 2007?* 2 (SSRN Working Paper No. 1015987, 2007), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1015987.

120. *Id.* Essentially, the authors argue that if shared models are wrong, an unanticipated error is shared by everyone.

121. There also might have been amplifying mechanisms that exacerbated or expanded market losses. For example, highly leveraged hedge funds apparently borrowed money from banks and invested in significant amounts of MBS, CDO, and ABS CDO securities backed by subprime mortgages. See, e.g., Paul Davies & Gillian Tett, *supra* note 104 (reporting that hedge funds borrowed large amounts of money to invest in CDO securities). Failure of these hedge funds resulting from losses on these securities can affect the bank lenders. Another possible amplifying mechanism is that certain bank-sponsored investment conduits purchased AAA-rated CDO and ABS CDO securities with the proceeds of short-term commercial paper. As the CDO and ABS CDO securities were marked down in value and investors failed to roll over their commercial paper, the bank sponsors faced the prospect of having to make

for the first time with the reality that highly rated tranches of subprime MBS could lose money, investors appear to have lost confidence, shunning all complex securitization products. To this extent, future investors should try to better understand these types of investments so that confidence is built on a firmer foundation.

Adverse selection also helps to explain the rapid infection. Investors became uncertain which securitization products, and indeed which securitization counterparties, were good and which were bad. They therefore stopped investing in all securitization products. Adverse selection can be mitigated through information; in this case, by valuing the securities and ascertaining the holdings of securitization counterparties. However, because CDO and ABS CDO securities were not actively traded, and there was no established market price to which to mark them, these securities could not be valued at "market." Valuation, therefore, was priced off quantitative models. Marking-to-model, however, creates intrinsic valuation uncertainties, and indeed the valuations priced off those models proved hopelessly unreliable. The indirect holding system for securities also made it very difficult to ascertain whether CDO and ABS CDO securities were held by securitization counterparties, and as long as that system continues to dominate securities holdings, this difficulty will remain.

The third explanation is also related to valuation. Absent a real market, valuation of CDO and ABS CDO securities must, as indicated, be priced off quantitative models. It is critical, then, that the range of models used by investors be sufficiently diverse that errors in one model will not cut across all models.

D. WHY WAS THE MARKET-DISCIPLINE APPROACH INSUFFICIENT?

Under a market-discipline approach, the regulator's job is to ensure that the private sector exercises the type of diligence that enables markets to work efficiently.¹²² Until recently, it

payments to the conduits pursuant to liquidity and credit-enhancement facilities. See Carrick Mollenkamp & Margot Patrick, *Credit Crunch: Citigroup Moves to Quell SIV Concerns*, WALL ST. J., Sept. 7, 2007, at C2 (reporting that Citibank was unable to raise money through the sale of asset-backed commercial paper); see also *infra* note 148 and accompanying text.

122. Cf. Ben S. Bernanke, Chairman, Bd. of Governors, Fed. Reserve Sys., Remarks at the Federal Reserve Bank of Atlanta's 2006 Financial Markets Conference (May 16, 2006), available at <http://www.federalreserve.gov/newsevents/speech/Bernanke20060516a.htm> (observing that, to the extent

appeared that a market-discipline approach worked well for the banking and securities-brokerage industries.¹²³ In the subprime context, however, this approach failed. To explain this failure, this Essay examines several hypotheses:

Hypothesis: Certain foundations of a market-discipline approach have rotted.

Regulators implement a market-discipline approach by ensuring that market participants have access to adequate information about risks and by arranging incentives so that those who influence an institution's behavior will suffer if that behavior generates losses.¹²⁴ In the recent financial crisis, however, disclosure inadequately conveyed information about the risks for various reasons,¹²⁵ including that certain of the structured finance transactions were too complex to be adequately disclosed.¹²⁶ Furthermore, the incentives of managers did not appear to be fully aligned with those of their institutions; managers would not necessarily suffer and, more importantly, they would not expect to suffer, if their behavior generated losses to their institutions.¹²⁷ Additionally, in the context of systemic risk, there were fundamental misalignments between institutional and financial market interests.¹²⁸

hedge funds are regulated solely through market discipline, government's "primary task is to guard against a return of the weak market discipline that left major market participants overly vulnerable to market shocks").

123. See, e.g., Helen A. Garten, *Banking on the Market: Relying on Depositors to Control Bank Risks*, 4 YALE J. ON REG. 129, 129–30 & n.1 (1986); Albert J. Boro, Jr., Comment, *Banking Disclosure Regimes for Regulating Speculative Behavior*, 74 CAL. L. REV. 431, 471 (1986).

124. See sources cited *supra* note 123; cf. Ben S. Bernanke, Chairman, Bd. of Governors, Fed. Reserve Sys., Remarks at the New York University Law School (Apr. 11, 2007), available at <http://www.federalreserve.gov/newsevents/speech/Bernanke20070411a.htm> ("Receivership rules that make clear that investors will take losses when a bank becomes insolvent should increase the perceived risk of loss and thus also increase market discipline. . . . In the United States, the banking authorities have ensured that, in virtually all cases, shareholders bear losses when a bank fails.").

125. See generally *supra* Part II.A.

126. See *supra* notes 52–54 and accompanying text.

127. See *supra* notes 59–63 and accompanying text (observing potential agency-cost conflicts between investment bankers who structured, sold, or invested in securities and the institutions for which they worked).

128. See *supra* notes 87–88 and accompanying text (arguing that structured finance may have dispersed subprime mortgage risk so widely that there was no clear incentive for any given investor to monitor it); see also *infra* text accompanying note 131 (observing that from the standpoint of systemic risk, a market-discipline approach is inherently suspect because no firm has sufficient incentive to limit its risk taking in order to reduce the danger of systemic

Market discipline also may have failed due to the simple human greed of market participants.¹²⁹ In the face of greed, market discipline is undermined by the availability heuristic¹³⁰ as well as the almost endemic shortage of funding for regulatory monitoring.

Market discipline alone, therefore, appears to be an insufficient approach.

***Hypothesis:* At least regarding systemic risk, market discipline is inherently suspect because no firm has sufficient incentive to limit its risk taking in order to reduce the danger of systemic contagion for other firms.**

Recall that the externalities of systemic failure include social costs that can extend far beyond market participants, resulting in a type of tragedy of the commons.¹³¹ Thus, a firm that exercises market discipline by reducing its leverage will marginally reduce the overall potential for systemic risk; but if other firms do not also reduce their leverage, the first firm will likely lose net asset value relative to the other firms.¹³²

Summary: The preceding discussion shows that a market-discipline approach must be supplemented and that market discipline is particularly suspect as a protection against systemic risk.

E. WHY DID THE RATING AGENCIES FAIL TO ANTICIPATE THE DOWNGRADES?

This failure is particularly problematic due to the extent of investor overreliance on rating-agency ratings.¹³³ For this failure, this Essay examines several hypotheses:

***Hypothesis:* Rating agencies failed due to conflicts of interest regarding compensation.**

contagion for other firms).

129. See Roberta Romano, *A Thumbnail Sketch of Derivative Securities and Their Regulation*, 55 MD. L. REV. 1, 79 (1996) (discussing greed as a central factor that, in the hedge-fund context, transforms a successful hedging or moderately risky investment strategy into one of high-risk speculation). *But cf.* Bernanke, *supra* note 122 (suggesting a possible alternative psychological explanation, at least in the case of the failure of market discipline with respect to LTCM's investors, that those "[i]nvestors, perhaps awed by the reputations of LTCM's principals, did not ask sufficiently tough questions about the risks that were being taken to generate the high returns"); *supra* note 39 and accompanying text (describing the "overreliance" hypothesis).

130. See *supra* notes 48–49 and accompanying text.

131. See *generally supra* notes 65–67 and accompanying text.

132. See E-mail from Bookstaber, *supra* note 35.

133. See *supra* text accompanying notes 41–43.

Rating agencies are customarily paid by the issuer of securities,¹³⁴ but investors rely heavily on their ratings.¹³⁵ This is technically a conflict, but it is not usually a material conflict because ratings are made independently of the fee received.¹³⁶ Furthermore, the reputational cost of a bad rating usually far exceeds the income received by giving the rating.¹³⁷

In the subprime crisis, though, the conflict would have been more material than normal because ratings were given to numerable issuances of CDO and ABS CDO securities, with each issuance (and rating) earning a separate fee. Assuming arguendo this created a material conflict, there is no easy solution. The question of who pays for a rating is difficult. Historically, rating agencies made their money by selling subscriptions, but that may not generate sufficient revenue to allow rating agencies to hire the top-flight analysts needed to rate complex deals.¹³⁸ And even if there was an easy way to get investors to pay for ratings, that might create the opposite incentive: to err on the side of low ratings in order to increase the rate of return to investors, thereby increasing the cost of credit to companies.¹³⁹

Hypothesis: Rating agencies failed to foresee that the depth of the fall of the housing market could, and indeed did, exceed their worst-case modeled scenarios.

This hypothesis begs the question of whether the rating agency models were reasonable, at least when viewed ex ante. That question is, effectively, identical to the earlier question of whether the failure by investors to envision the actual worst-

134. Steven L. Schwarcz, *Private Ordering of Public Markets: The Rating Agency Paradox*, 2002 U. ILL. L. REV. 1, 15.

135. *See id.* at 3.

136. *See id.* at 16.

137. *See id.* at 14.

138. *See id.* at 16 n.94. For other possible ideas of how to avoid conflicts of interest in paying rating agencies, see Alan S. Blinder, *Economic View: The Case for a Newer Deal*, N.Y. TIMES, May 4, 2008, § 3 (Business), at 4 (noting ideas of his Princeton University colleagues, such as paying rating agencies with some of the securities they rate, or having a governmental entity pay rating agencies from the proceeds of a tax levied on issuers). Professor Blinder admits the difficulty of avoiding conflicts of interest, requesting that “[i]f you have a better idea, write your legislators.” *Id.*

139. *Cf.* Steven L. Schwarcz, *Temporal Perspectives: Resolving the Conflict Between Current and Future Investors*, 89 MINN. L. REV. 1044, 1053–54 (2005) (observing that, to the extent ratings affect not only new investors but also existing investors, the analysis is complicated by the inherent conflict between those two sets of investors).

case scenario may have reflected, to some extent, a failure to take a sufficiently long view of risk.¹⁴⁰ The earlier analysis proposed two possible answers: that the failure simply reflected a failed judgment call, made *ex ante*, of what the worst-case could be like,¹⁴¹ and that the failure also may have reflected behavioral bias caused by the availability heuristic.¹⁴²

It is unlikely that the failure of rating-agency models reflected significant behavioral bias since these models are constructed by multiple trained and experienced analysts.¹⁴³ To the extent the failure reflected a failed *ex ante* judgment call, this type of failure may be inevitable—even for rating agencies—because the exercise of judgment involves an inherent risk of error. The hope is that rating agencies, through their institutional memory, will learn from experience and exercise better judgment in the future.

At least one commentator argues that the rating agency failure likely reflected an underappreciation of how an oversupply of mortgage money was artificially driving up home prices in subprime areas.¹⁴⁴ This would be rather surprising, if true, given rating agency sophistication. It also is possible that the rating-agency models may have failed because of fraud in the borrower-income data.¹⁴⁵ To this extent, rating agencies may be stymied because they have little alternative in most cases but to accept as true the data they receive.¹⁴⁶

Hypothesis: Rating agencies failed to fully appreciate the correlation in subprime mortgage loans when analyzing CDOs, especially ABS CDOs.

140. See *supra* notes 33–38 and accompanying text.

141. See *supra* text accompanying notes 34–37.

142. See *supra* notes 48–51 and accompanying text.

143. In order to qualify as a Nationally Recognized Statistical Rating Organization (NRSRO), the rating agency must employ “an adequate number of staff members with the education and experience necessary to competently evaluate an issuer’s credit.” Arturo Estrella et al., *Credit Ratings and Complementary Sources of Credit Quality Information* 51 (Bank for Int’l. Settlements, Paper No. 3, 2000), available at http://www.bis.org/publ/bcbs_wp3.pdf?noframes=1. *But cf.* Gerry McNamara & Paul Vaaler, A Management Research Perspective On How and Why Credit Assessors ‘Get it Wrong’ When Judging Borrowers 3 (May 3, 2008) (unpublished manuscript, on file with author) (suggesting that rating-agency models may have failed in part because of systematic biases resulting from behavioral factors).

144. See Mian & Sufi, *supra* note 36, at 24–25.

145. See *supra* note 71.

146. See Schwarcz, *supra* note 134, at 6 (observing that rating agencies do not, and cannot pragmatically, rate for fraud).

Early CDOs and ABS CDOs had highly diversified underlying assets.¹⁴⁷ Later CDOs and ABS CDOs were still diversified but were more susceptible to a finance-based link in which prices of the underlying assets start to move in lockstep as investors hedge their exposure to those assets.¹⁴⁸ Furthermore, even though later ABS CDOs had significant diversification in the ABS and MBS securities included therein, there was an underlying correlation in the subprime mortgage loans backing the different MBS securities. Rating agencies, however, continued to use historical cash-flow models which did not anticipate the degree of price convergence or correlation of subprime loans.¹⁴⁹

Summary: Rating agencies obviously failed to anticipate the worst-case scenario represented by the subprime meltdown. Although this failure might have resulted in part from conflicts of interest in the way rating agencies are paid, that is unlikely since payment is independent of the rating. Furthermore, the reputational cost of issuing bad ratings usually far exceeds the payment received. In any event, there is no easy solution to the dilemma of how rating agencies can be paid without creating conflicts with either issuers or investors.

A more likely explanation for the failure is that ratings are judgment calls by human beings, and mistakes inevitably will be made.¹⁵⁰ One might argue that rating agencies should be

147. One explanation for the erosion of diversification is the growth of synthetics. *See infra* note 145.

148. *See also* Jody Shenn, *Overlapping Subprime Exposure Mask Risks of CDOs*, *Moody's Says*, BLOOMBERG.COM, Apr. 4, 2007, <http://www.bloomberg.com/apps/news?pid=20601170&sid=aszosOrxVmjk&refer=home> (reporting that the growth of synthetics in the CDO market has created situations where assets and the synthetic products derived from those assets are in the same CDO, causing the CDO to be exposed to the same risk twice); *see also* E-mail from Bookstaber, *supra* note 35 (discussing this link).

149. *See The Role of Credit Rating Agencies in the Structured Finance Market: Hearing Before the Subcomm. on Capital Markets, Insurance and Government Sponsored Enterprises of the H. Comm. on Financial Servs.*, 110th Cong. 63 (2007) (statement of Mark Adelson, Member, Adelson & Jacob Consulting, LLC). Another possible hypothesis is that there has been rating-agency "grade inflation." *See* Charles W. Calomiris, *Not (Yet) a Minsky Moment*, AMERICAN ENTERPRISE INSTITUTE, at 18, Oct. 5, 2007, [http://www.aei.org/doclib/20071010_Not\(Yet\)AMinskyMoment.pdf](http://www.aei.org/doclib/20071010_Not(Yet)AMinskyMoment.pdf) ("Grade inflation has been concentrated particularly in securitized products, where the demand is especially driven by regulated intermediaries."). However, even if there was grade inflation, the consequences are unclear since investors were probably not misled but simply did not care so long as the securities purchased were in fact rated investment grade.

150. *S&P Announces New Actions to Strengthen the Ratings Process*, CRE-

more conservative, or that government should mandate more conservative ratings, but overprotection itself has a cost. If rating agencies had used more conservative models requiring greater overcollateralization, those models would have been decried as wasteful if housing prices had not collapsed.

Whatever the reasons for the failure by rating agencies to anticipate the downgrades, it should be noted that rating agencies may not be perfect but the *idea* of rating agencies is important. Individual investors face relatively high costs to assess the creditworthiness of complex securities. Rating agencies can make this assessment on behalf of many individual investors, thereby achieving an economy of scale.¹⁵¹

CONCLUSION

This Essay has suggested various insights into protecting financial markets. Additional insight can be gained by recognizing that most of the causes of the anomalies and failures can be divided into three categories: (i) conflicts; (ii) complacency; or (iii) complexity.¹⁵²

The first category, conflicts, is the most tractable. Once identified, conflicts can often be managed. For example, this Essay has shown that the excesses of the originate-and-distribute model can be managed by aligning the interests of mortgage lenders and investors by requiring the former to retain a risk of loss. Some conflicts, though, may be harder to manage in practice, such as conflicts in how rating agencies are paid.

The second category, complacency, is less tractable because solutions to complacent behavior can require changing human nature, an obviously impossible task. After a crisis, everyone focuses on avoiding that crisis in the future (though hopefully also avoiding the all-too-human tendency to fall into the rut of fighting the “last war”¹⁵³). But bounded rationality makes investors forget such crises with alacrity.¹⁵⁴

DIT WK., Feb. 13, 2008, at 12 (proposing various procedural review steps to minimize human failure in the ratings process and to increase the efficiency of, and public confidence in, credit ratings).

151. See *supra* note 43.

152. I am grateful to Professor Jonathan Lipson for suggesting these categories.

153. *Systemic Risk Hearing*, *supra* note 2, at 27 (statement of Steven L. Schwarcz, Stanley A. Star Professor of Law and Business, Duke University).

154. Cf. *supra* note 51 and accompanying text (observing that investors quickly forget past financial crises and “go for the gold”).

The subprime mortgage crisis appears to have discredited, though, at least one form of complacency: widespread investor obsession with securities that have no established market and, instead, are valued by being marked-to-model.

Other forms of complacency are rational and can only be addressed through structural changes. For example, investors will almost certainly continue to overrely on rating-agency ratings, so long as the cost of making independent credit investigations remains high. If rating agencies continue to provide unreliable ratings, perhaps investors should consider whether innovative collective-action approaches, such as collective credit determinations by groups of investors, might prove more reliable.¹⁵⁵

The third category, complexity, is least tractable.¹⁵⁶ Complexity can deprive investors and other market participants of the information needed for markets to operate effectively. It was responsible for the failure of disclosure in the subprime crisis. Even beyond disclosure, complexity is increasingly a metaphor for the modern financial system and its potential for failure, illustrated further by the tight coupling that causes markets to move rapidly into a crisis mode; the potential convergence in quantitatively constructed investment strategies; the layers inserted between obligors on loans and other financial assets and the assets' beneficial owners, which make it difficult to work out underlying defaults;¹⁵⁷ and the problem of adverse selection, in which investors, uncertain which investments or counterparties are sound, begin to shun all investments. Solving problems of financial complexity may well be the ultimate twenty-first century market goal.¹⁵⁸

These categories are broad, but they do not capture everything. One might propose, for example, a fourth category: cupidity. Greed, however, is so ingrained in human nature and so

155. Collective approaches, though, might face potential antitrust hurdles.

156. Cf. Michael Mandel, *The Economy's Safety Valve*, BUS. WK., Oct. 22, 2007, at 36 ("In today's complex and globally integrated financial markets, it's almost impossible for regulators to plug every hole.")

157. See, e.g., Interview with Hirsch, *supra* note 102 (observing that, because of these layers, the "instruments were so complex that no one followed the trail").

158. See, e.g., Steven L. Schwarcz, *Complexity as a Catalyst of Market Failure: A Law and Engineering Inquiry* 2 n.5 (SSRN Working Paper No. 1240863, 2008), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1240863.

intertwined with the other categories that it adds little insight to view it as a separate category.

These categories also do not capture the problem of systemic risk, whose uniqueness arises from a type of tragedy of the commons. Because the benefits of exploiting finite capital resources accrue to individual market participants whereas the costs of exploitation are distributed among an even wider class of persons, market participants have insufficient incentive to internalize their externalities. Government, however, can provide solutions, such as creating a liquidity provider of last resort to purchase securities in collapsing markets (albeit at profitable discounts to minimize moral hazard) in order to mitigate market instability that would lead to systemic collapse.¹⁵⁹

A final possible inquiry is to ask whether periodic financial market instabilities are harmful or, in the long run, possibly helpful to the economy. For example, perhaps the subprime financial crisis, or something like it, was needed to turn around the incentive-distorting liquidity glut of the past few years.¹⁶⁰ Financial market instabilities are believed to be acceptable if they are “relatively limited in scope,” even if deep in their narrow impact.¹⁶¹ Indeed, such instabilities “may serve as critical safety valves.”¹⁶² There are, however, two concerns. On a distributional level, market instabilities impact people, and in the subprime crisis many of those affected have been “low-income” individuals.¹⁶³ On a more fundamental level, there is “no guarantee that the next crisis won’t spread and turn into the Big One, which undermines the whole financial system.”¹⁶⁴

159. See Schwarcz, *supra* note 66, at 241–42.

160. Cf. Balakrishnan et al., *supra* note 72, at 8 (discussing the liquidity glut).

161. Mandel, *supra* note 156, at 34.

162. *Id.*

163. *Id.* at 36–37. That many of the affected individuals have been “low-income” individuals does not conflict with this Essay’s earlier observation that QIBs are the investors who lost the most money in the subprime crisis. See *supra* text accompanying note 64. Low-income individuals lost money not as investors but as foreclosed homeowners.

164. Mandel, *supra* note 153, at 37; see also Vikas Bajaj & Louise Story, *Mortgage Crisis Spreads Beyond Subprime Loans*, N.Y. TIMES, Feb. 12, 2008, at A1 (discussing the spread of the subprime crisis to other markets); cf. Michael D. Bordo et al., *Real Versus Pseudo-International Systemic Risk: Some Lessons from History* 10 (Nat’l Bureau of Econ. Research, Working Paper No. 5371, 1995), available at <http://www.nber.org/papers/w5371.pdf> (discussing how normal market expansions and contractions can turn into market crises in situations of “speculative mania”).