

WHY DIDN'T SUBPRIME INVESTORS DEMAND A (MUCH LARGER) LEMONS PREMIUM?

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I INTRODUCTION

The present financial crisis began as a subprime-mortgage crisis.¹ Mortgages made to borrowers with less-than-stellar credit, on terms that might result in sharply higher loan payments in the near term² and that assumed continuing housing-price appreciation, were sold into the secondary markets and securitized.³ The securitized instruments plummeted in value as the underlying mortgages defaulted at increasing rates, foreclosures skyrocketed, and housing prices plunged.⁴ As of this writing, in the winter of 2011, the stock market has largely recovered, but the housing market and employment are depressed, and are likely to remain so in the near to moderate term.⁵

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1. I follow the press convention that characterizes the crisis relating to mortgage debt as the “subprime crisis.” See, e.g., Louise Story et al., *Wall St. Helped to Mask Debt Fueling Europe's Crisis*, N.Y. TIMES, Feb. 14, 2010, at A1. However, many of the loans at issue were to borrowers with credit better than subprime but not quite as good as prime. The technical name for such borrowers is “Alt-A.” See *Alt-A*, INVESTOPEDIA, <http://www.investopedia.com/terms/a/alt-a.asp> (last visited Feb. 17, 2011).

2. See Federal Reserve Bank of St. Louis, *What Is Subprime Lending?*, MONETARY TRENDS, June 2007, at 1, available at <http://research.stlouisfed.org/publications/mt/20070601/mtpub.pdf>.

3. Yuliya Demyanyk & Otto Van Hemert, *Understanding the Subprime Mortgage Crisis 6* (Dec. 5, 2008) (unpublished manuscript) (on file with Federal Reserve Bank of Cleveland), available at <http://rfs.oxfordjournals.org/content/early/2009/05/04/rfs.hhp033.full.pdf+html>.

4. See, e.g., Claire A. Hill, *Who Were the Villains in the Subprime Crisis, and Why It Matters*, 4 ENTREPRENEURIAL BUS. L.J. 323, 331 (2010).

5. See Helen Chernikoff, *Analysis: U.S. Homebuilding's Long Winter Won't End This Spring*, REUTERS (Feb. 18, 2011, 4:29 PM), <http://www.reuters.com/article/2011/02/18/us-homebuilders-spring-idUSTRE71H6VF20110218>; Edward Krudy, *Dow and S&P End at Highest Levels Since June 2008*,

How did this happen? Voluminous literature provides a multitude of reasons. Investors' willingness to buy subprime securities at high prices without doing sufficient research into the securities' quality is an important part of the story.⁶ Why would investors behave this way? Too few commentators pay attention to this question.

The specific trajectory leading up to the crisis will not be repeated. No one currently makes mortgage loans at low rates on overvalued houses to borrowers with insufficient or undocumented income, nor is there investor demand to buy interests in such loans.⁷ There is, however, always a danger of future crises. Given ever-increasing financial-engineering capabilities and investors' short memories, we can expect the potential for damage from future financial crises to dramatically increase as time goes on; the search for preventive measures is thus of critical importance.

The subprime crisis resulted in significant part from a market bubble—a bubble in the price of real estate. Market bubbles are a familiar phenomenon. Investors engage in frenzied bidding for assets, fearing they will miss out on a huge payday; the bidding accelerates, inflating the assets' prices to unsustainable levels.⁸ The mindset is both familiar and intuitive.

But traditional economic theory and a contrary intuition make bubble behavior in this context puzzling. Traditional theory suggests that investors will underpay for securities unless they can assure themselves that what they are buying is not a “lemon”;⁹ intuition, too, suggests wariness in such circumstances. Investors bought complex securities they could not properly value. Why did they pay such high prices? One might think they would instead discount for uncertainty and demand a premium to compensate them in case they were buying a lemon.

Perhaps investors thought the lemon securities were “sweetened” because of the sellers' stake in their reputation—sellers, not wanting to risk the loss of reputation and future business, would do their best not to sell lemon securities.

REUTERS (Feb. 1, 2011), <http://www.reuters.com/article/2011/02/01/us-markets-stocks-idUSTRE70U2DI20110201>; Sewell Chan, *Bernanke Takes Sides on Debt Limit Vote*, N.Y. TIMES, Feb. 4, 2011, at B1.

6. See, e.g., Hill, *supra* note 4, at 325.

7. That being said, some investors have been willing to buy resecuritizations of real-estate mortgage-investment conduits (re-REMICs), securities made from the detritus of failed subprime mortgage pools. Jody Shenn, *Toxic CDOs Given Up for Dead Coming to Life with Pension Funds*, BLOOMBERG (July 8, 2008, 12:01 AM), <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a0TGMrBy2PyE>. Investors apparently concluded that the market was undervaluing mortgage securities, and perhaps that the new deals' structural safeguards would be effective. See *id.* Some of these new deals are already being downgraded. See Daniel Invidiglio, *2009 Vintage Re-REMICs Downgraded to Junk*, THE ATLANTIC (May 17, 2010, 3:09 PM), <http://www.theatlantic.com/business/archive/2010/05/2009-vintage-re-remics-downgraded-to-junk/56838/>.

8. See Jeremy Bulow & Paul Klemperer, *Rational Frenzies and Crashes*, 102 J. POL. ECON. 1, 1 (1994). See generally CHARLES P. KINDLEBERGER ET AL., *MANIAS, PANICS, AND CRASHES: A HISTORY OF FINANCIAL CRISES* (5th ed. 2005).

9. George A. Akerlof, *The Market for “Lemons”: Quality Uncertainty and the Market Mechanism*, 84 Q.J. ECON. 489–90 (1970).

But an explanation relying on the reputational stake of the sellers—the investment banks—is insufficient. The time horizons of many individuals selling on behalf of investment banks are far shorter than those of their employers.¹⁰ Investment banks have failed to sufficiently constrain the behavior of these individuals.¹¹ Moreover, it is generally known that the investment banks themselves sometimes put their own interests ahead of their customers'.¹²

Perhaps the investors were simply unfaithful agents making investments for others. They could have made self-interested decisions to get a quick payoff in the form of fees or short-term results, calculating that the payoff would exceed any long-term financial or reputational cost. This explanation does not work either: it leaves unanswered the question of why the ultimate investors would not have chosen better agents or monitored them more carefully. Moreover, many sophisticated market actors were not investing for others. Rather, they were buying the securities for their own account. Investment banks that structured these securities sometimes kept a portion of the issuance. Many investors in these securities, including the investment banks, suffered significant losses when the securities plummeted in value.¹³

Perhaps the investors simply relied on the rating agencies' AAA ratings for the securities. This also seems unlikely, given that Enron was scarcely in the distant past, and that the securities offered higher yields than other AAA-rated securities, indicating they were of lower quality.¹⁴ Moreover, during the latter part of the period in which subprime securities were popular investments, the securities' low quality became sufficiently evident that reliance on rating-agency ratings became progressively less tenable.¹⁵ Of course, why the rating agencies gave such highly inflated ratings remains puzzling. One possible explanation is that the agencies were aware of the inflation, in which case they risked their

10. Much popular writing on the crisis documents that bankers have more loyalty to themselves than to their banks. See, e.g., JONATHAN KNEE, *THE ACCIDENTAL INVESTMENT BANKER* (2006). The classic articulation of the broader phenomenon, wherein “agents” have interests that diverge from those of their “principals,” can be found in Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305 (1976).

11. See, e.g., KNEE, *supra* note 10.

12. *Id.*; see also John Carney, *Citigroup Settlement Shows Low Cost of Lying to Markets*, CNBC (July 31, 2010, 3:23 PM), http://www.cnbc.com/id/38488423/Citigroup_Settlement_Shows_Low_Cost_of_Lying_to_Markets.

13. See, e.g., Yalman Onaran, *Banks' Subprime Losses Top \$500 Billion on Writedown*, BLOOMBERG (Aug. 12, 2008, 4:07 PM), <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a8sW0n1Cs1tY&refer=home>; *Hedge Fund Sues Big Banks over Subprime Losses*, BUS. INS. (July 13, 2010, 10:02 AM), <http://www.businessinsurance.com/article/20100713/NEWS01/100719985> [hereinafter *Hedge Fund Sues Big Banks*]. Some investment banks may have hedged their exposure; if they did hedge, however, many, and perhaps most of them, did not hedge enough. See *Hedge Fund Sues Big Banks*, *supra*; see also Louise Story, *Merrill's Downfall Provides Disclosure Lesson*, N.Y. TIMES DEALBOOK (Aug. 9, 2010, 6:36 PM), <http://www.nytimes.com/2010/08/10/business/10merrill.html?hp>.

14. See Demyanyk & Van Hemert, *supra* note 3, (manuscript at 25–26).

15. See *infra* note 44 and accompanying text.

reputations. Another is that the agencies were somehow unaware of the inflation. Neither of these explanations rings true.¹⁶

The most satisfactory explanation for why investors did not demand a much larger lemons premium lies in the incentives for “herding” among agents who made investment decisions for others.¹⁷ Investors (and markets) compare investment managers to other investment managers.¹⁸ A manager’s best strategy, therefore, may be to do what her peers do regardless of whether the manager believes her peers are a reliable source of information about the quality of the investment decision.¹⁹ Standard psychological forces including over-optimism and confirmation bias also help explain how this trajectory progresses and continues.²⁰

Yet even this explanation is unsatisfactory with respect to the many investors who were making investment decisions for themselves. For such investors, an alternative explanation may be an internal analogue of herding: the desire to avoid regret.²¹ Here, too, over-optimism and confirmation bias would keep investors on the same trajectory, making progressively larger bets that subprime-mortgage securities were good investments. Even supposedly sophisticated investors are not immune to investing based either on their own belief that prices can follow a dramatic upward trajectory for a long time, or their assessment that others will hold this belief.

Investors’ purchases of subprime securities, particularly in the period from 2005 to 2007, thus cannot be explained by a simple economic account; they require a more complex explanation. The explanation given here should be applicable more generally, whenever a new financial instrument with a respectable genesis is developed: under certain stylized circumstances, we can expect the lemons model not to work as simple economic theory and common

16. See generally Claire A. Hill, *Why Did Rating Agencies Do Such a Bad Job Rating Subprime Securities?*, 71 U. PITT. L. REV. 585 (2010).

17. Two early, influential articles on herding are Sushil Bikhchandani et al., *A Theory of Fads, Fashion, Custom, and Cultural Change as Informational Cascades*, 100 J. POL. ECON. 992 (1992) and David S. Scharfstein & Jeremy C. Stein, *Herd Behavior & Investment*, 80 AM. ECON. REV. 465 (1990). There is a rich literature on the subject. See, e.g., Andrea Devenow & Ivo Welch, *Rational Herding in Financial Economics*, 40 EUR. ECON. REV. 603, 603 (1996); David Hirshleifer & Siew Hong Teoh, *Herd Behaviour and Cascading in Capital Markets: A Review and Synthesis*, 9 EUR. FIN. MGMT. 25, 25 (2003); Torben Lütje, *To Be Good or To Be Better: Asset Managers’ Attitudes Towards Herding*, 19 APPLIED FIN. ECON. 825, 825 (2009); Ivo Welch, *Herding Among Security Analysts*, 58 J. FIN. ECON. 369, 369 (2000).

18. See Sushil Bikhchandani & Sunil Sharma, *Herd Behavior in Financial Markets*, 47 IMF STAFF PAPERS 279, 280 (2000); Judith Chevalier & Glenn Ellison, *Career Concerns of Mutual Fund Managers*, 114 Q.J. ECON. 389, 389 (1999); see also Harrison Hong, Jeffrey D. Kubik & Amit Solomon, *Security Analysts’ Career Concerns and Herding of Earnings Forecasts*, 31 RAND J. ECON. 121 (2000). The Hong, Kubik & Solomon article makes distinctions among money managers; this article glosses over such distinctions, treating them monolithically.

19. Bikhchandani & Sharma, *supra* note 18, at 280.

20. See generally Donald C. Langevoort, *Chasing the Greased Pig Down Wall Street: A Gatekeeper’s Guide to the Psychology, Culture and Ethics of Financial Risk-Taking*, 96 CORNELL L. REV. (forthcoming 2010).

21. See, e.g., BARRY SCHWARTZ, *THE PARADOX OF CHOICE* 147–65 (2004).

sense suggest it should. Investors may not charge a suitable premium for such instruments, which provides financing that is “too cheap” and thus becomes far too plentiful. This is precisely what happened in the subprime-mortgage (now, financial) crisis. The need for adequate explanations and policy responses is critical, as investor decisions increasingly hold the potential to damage the greater society.

II

THE PUZZLE

The cast of characters involved in subprime lending includes the borrowers who took out the loans, the originators of the loans (mortgage brokers and lending banks), the appraisers who helped the originators justify the collateral value underlying the loans, the investment banks that packaged the loans into securities, the lawyers who helped the investment banks package the loans, the rating agencies that rated the securities, the investors who purchased the securities, and the insurers who insured the securities. Most actors’ behavior is fairly easy to understand and explain using standard and simple paradigms; investor behavior requires a more complex explanation.²²

Simple economic theory explains what motivated the originators and lenders, especially their individual agents, given the ready market for their loans. They could in effect “take the money and run,” earning considerable front-end fees by originating, making, and selling questionable loans, and (often) leaving their jobs before the loans could default.²³ Even if they did not leave the jobs before problems with the loans surfaced, the fees they had earned might outweigh any monetary or reputational penalty.²⁴ As markets’ appetites for loans increased, originators and lenders continually lowered their standards:²⁵ once the better borrowers had been persuaded to borrow, supply could only be increased by lending to lower-quality borrowers. Loans to lower-quality borrowers not infrequently had onerous terms, including high interest rates, high fees, and penalties. The loans therefore commanded high sales prices on the market. As one subprime lender said, “The market is paying me more to do a no-income-verification loan than it is paying me to do the full documentation loans. What would you do?”²⁶

Other actors’ motivations are relatively straightforward as well. Borrowers might simply have believed overoptimistic stories about house appreciation, their future income, or both. Some other individuals may have been pressured to act as they did. Both rating-agency employees and appraisers reported

22. For a stylized account of the behavior of private actors in the crisis, see Hill, *supra* note 4, at 327–31. The discussion in Part II of the text draws from the discussion in this article.

23. *Id.* at 332–36.

24. *See id.*

25. *See* Demyanyk & Van Hemert, *supra* note 3 (manuscript at 25–26).

26. Floyd Norris, *Caveat Emptor, Continued*, N.Y. TIMES, Aug. 6, 2010, at B1.

pressure from their supervisors to give inflated ratings and appraisals.²⁷ Faced with certain immediate dismissal or potential negative consequences in the future, they chose the latter.²⁸ Most of the remaining actors—the rating agencies themselves, the investment banks in their capacities as instrument-structurers, and the law firms (both the institutions and the individuals)—may have persuaded themselves that rocket scientists had discovered how to vastly minimize risk and maximize return—that “this time is different.”²⁹ Individual bankers or lawyers might have believed that even if there was a bubble that would eventually burst, they would come out unscathed.³⁰

There is one group, however, whose participation is hard to explain: the investors. This group includes the investment banks that retained portions of the securities they packaged and the insurers that bet on the instruments’ continuing value. The investors charged a too-small lemons premium.³¹ Simple economic theory predicts that investors (particularly sophisticated investors, like the large institutions that purchased these instruments and the hedge funds that sold “insurance” against declines in the instruments’ value) would, if anything, discount too much rather than too little when they purchase a new and complex financial instrument, especially one comprised in significant part of a novel and low-quality asset class, subprime mortgages. Investors could not determine the securities’ value with much confidence or precision; indeed, neither could the securities’ sellers. And insofar as those sellers made representations regarding the securities’ quality, the buyers should have known to be wary: The sellers had the incentive all sellers have—to represent the securities’ quality as being better than it actually was.

Investors had several ways to defend their purchases of subprime-mortgage securities. Assuming housing prices would continue to rise was, they thought (or at least told themselves and others), reasonable, as was relying on the expertise of rating agencies. Prime-mortgage securities were successful instruments, and subprime-mortgage securities had done well since their recent introduction.³²

But this defense was not enough to justify the pattern of subprime-securities purchases—that enormous quantities of securities were bought over a several-year period, with many investors returning again and again to the trough. As

27. See Hill, *supra* note 4, at 336–41.

28. *Id.*

29. *Id.* at 341–45. This phrase is the title of an excellent book on the crisis, CARMEN M. REINHART & KENNETH ROGOFF, *THIS TIME IS DIFFERENT: EIGHT CENTURIES OF FINANCIAL FOLLY* (2009).

30. See generally Hill, *supra* note 4, at 343–45.

31. Of course, just because investors suffered losses does not mean they did not receive appropriate compensation for bearing them. There is no theoretically unassailable method of showing what the expected risks were *ex ante* and, hence, the appropriate risk premium. Nonetheless, most commentators believe that, judged *ex ante*, the risk premium charged was lower than it should have been. See, e.g., Demyanyk & Van Hemert, *supra* note 3 (manuscript at 5).

32. See Claire A. Hill, *Why Did Anyone Listen to the Rating Agencies After Enron?*, 4 MD. J. BUS. & TECH. L. 283, 292–93 (2009).

Robert Rodriguez, speaking to the Chartered Financial Analysts Society of Chicago on June 28, 2007, recounted,

We were on the March 22 call with Fitch [one of the three main rating agencies involved in rating subprime securities] regarding the sub-prime securitization market's difficulties. In their talk, they were highly confident regarding their models and their ratings. My associate asked several questions. "What are the key drivers of your rating model?" They responded, FICO scores [credit scores of homeowners] and home price appreciation (HPA) of low single digit (LSD) or mid single digit (MSD), as HPA has been for the past 50 years. My associate then asked, "What if HPA was flat for an extended period of time?" They responded that their model would start to break down. He then asked, "What if HPA were to decline 1% to 2% for an extended period of time?" They responded that their models would break down completely. He then asked, "With 2% depreciation, how far up the rating's scale would it harm?" They responded that it might go as high as the AA or AAA tranches.³³

Rodriguez's observation indicates the subprime securities' AAA rating was tenuous indeed. AAA is supposed to indicate real assurance of timely and full repayment. Fitch's basis for its rating apparently was an assumption that was both unrealistic and wildly optimistic, indicating the rating itself was not reliable. Astonishingly, a simple question had elicited this information from the rating agency, suggesting that the information was there for the asking.

Simple economic theory does not, of course, require all investors to charge the "right" lemons premium. It does, however, suggest that arbitrageurs, market actors who are in the business of searching for mispricing, will bring prices back to correct levels if the lemons premium becomes too high (or low). In the idealized paradigm, these actors have infinite confidence in their (basically contrarian) assessments and an endless supply of money to take positions based on their assessments.³⁴

In this case, prices stayed too high for a long period of time. Investors mispriced and arbitrageurs did not correct the investors' mistakes. Simple economic theory can readily accommodate mistaken prices when complete arbitrage is impossible, but here it was possible.³⁵ The same complex financial

33. Robert L. Rodriguez, Chief Exec. Officer, First Pac. Advisors, LLC, CFA Soc'y of Chi. Speech: Absence of Fear (June 28, 2007), available at http://www.fpafunds.com/news_070703_absence_of_fear.asp; see also Joshua D. Coval et al., *The Economics of Structured Finance 2* (Harvard Bus. Sch., Working Paper No. 09-060, 2008) (showing "how modest imprecision in the parameter estimates can lead to variation in the default risk of the structured-finance securities that is sufficient, for example, to cause a security rated AAA to default with reasonable likelihood").

34. For articulations of the theory with critiques, see Andrei Schleifer & Robert W. Vishny, *The Limits of Arbitrage*, 52 J. FIN. 35 (1997). See also Sanford J. Grossman & Joseph E. Stiglitz, *On the Impossibility of Informationally Efficient Markets*, 70 AM. ECON. REV. 393, 393 (1980); Andrei Shleifer & Lawrence H. Summers, *The Noise Trader Approach to Finance*, 4 J. ECON. PERSP. 19, 20 (1990).

35. Alessio Paces argues that once the ABX-CDS index was developed, facilitating arbitrage, arbitrageurs did correct the mispricing, which effectively initiated the crisis. See Alessio M. Paces, *Law and Economics of the Financial Crisis: Rethinking Market and Regulatory Failures in a World of Uncertainty* 6 (Aug. 2009) (unpublished manuscript) (on file with author), available at <http://www.eale09.eu/ocs2/index.php/EALE/roma09/paper/view/175/54>. My interviews with market participants suggest there was significant (but apparently not sufficient) arbitrage before dealers developed the ABX-CDS index. These participants note that important contributors to the crisis included originator bankruptcies and defaulting CDOs.

engineering used to craft the instruments investors purchased also created the means for arbitrage—for betting against (“selling short”)³⁶ the investments that ultimately proved so disastrous. Some investors did sell short, but apparently not in sufficient volume to bring prices back to appropriate levels.³⁷ Arbitrage was, by many accounts, possible, but did not occur to the extent necessary to bring prices closer to correct levels. Why didn’t enough arbitrage occur? Presumably the real-world arbitrageurs were not willing or able to expend enough money to correct the mispricing. Even those who were highly confident we were in a bubble did not know when the bubble would burst. It might not have been feasible for them to hold the arbitrage position for what could have been a considerable length of time.³⁸

Could investors have looked to other lemon-sweetening mechanisms? What about the reputation and expertise of the credit-rating agencies rating so many of the securities AAA? After Enron went bankrupt, relying on rating agencies would seem hard to justify: the agencies rated Enron’s debt “investment grade” four days before Enron declared bankruptcy. Even before Enron imploded, many sophisticated investors said they did not think highly of rating agencies’ analytic skills.³⁹ Investors could scarcely have forgotten about Enron: it went bankrupt in December of 2001, and its notoriety continued unabated. It might therefore seem puzzling that investors would listen to the rating agencies post-Enron. Yet they claim with some plausibility that they did.⁴⁰

Still, a puzzle remains: Listening to the rating agencies did not have to entail substituting the agencies’ judgment for their own. Investors were making progressively larger bets on subprime securities, and the cost to them of rating-agency errors was progressively increasing, as were the indications that the agencies might be making errors.⁴¹ Moreover, another reason to doubt the

36. For memorable accounts of arbitrageurs “shorting” subprime securities, see MICHAEL LEWIS, *THE BIG SHORT: INSIDE THE DOOMSDAY MACHINE* (2010). Lewis’s book makes clear that the overpricing of subprime securities was not hidden. *See id.* at 201–06. His book also makes clear that arbitrage opportunities were available for those who sought them with enough energy. *See id.* That being said, making bets that subprime securities would fall in value did become easier in 2006. *See Paces, supra* note 35; *see also* Gary B. Gorton, *The Panic of 2007*, at 3–4 (Nat’l Bureau of Econ. Research, Working Paper No. 14358, 2008), *available at* <http://www.nber.org/papers/w14358>. This development presumably contributed to the bubble’s bursting. *Id.*

37. Some, and perhaps many, investors betting against the short sellers apparently greatly underestimated the possibility that the short sellers might be correct. *See* Susan Pulliam et al., *Citigroup and Wachovia Hit with Lawsuits*, *WALL ST. J.*, Mar. 4, 2008, at C1.

38. *See* LEWIS, *supra* note 36, at 130.

39. Claire A. Hill, *Regulating the Rating Agencies*, 82 *WASH. U. L.Q.* 43, 65 n.110 (2004).

40. *See* Hill, *supra* note 32, at 284–85. As discussed in the article, they might have done so because of their prior beliefs that rating agencies were not corrupt, the “stickiness” of the practice of using the agencies, and available distinctions between the ratings at issue in Enron and the AAA ratings for structured securities.

41. One such indication was the prices on the subprime index, the ABX (“[M]y claim is that a very specific set of interlinked security designs made the chain susceptible to a house price decline. House prices stopped increasing in 2006, and the effects were revealed by ABX prices.”). Gorton, *supra* note 36, at 67.

rating agencies was always present: that the agencies were paid by the securities' issuers. Rating agencies worked with the issuers and their lawyers to craft instruments the agencies could rate highly.⁴² Even if an investor believed that the agencies' stake in their reputations would preclude outright purchase of high ratings, it should have taken into account the possibility of some biasing. At the very least, the issuer-pays business model led to a "can do" mindset, in which the question became not whether an instrument deserved a high rating, but how it could be structured to achieve the rating. The rating agencies may not have completely deferred to the investment banks' wishes, but they still found a way to give the senior tranche (or tranches) the issuer-desired ratings.⁴³

Other possible lemon-sweetening mechanisms involve reputational or financial stakes. Investors could have been reassured that investment banks were willing to stake their reputations and money on the securities. Still, investment banks were sellers and hence suspect. Moreover, their employees at both low and high levels may also have had a considerably shorter time horizon than the banks, because they could receive big bonuses soon after selling the securities.⁴⁴

Might investors have been reassured by insurance on the securities? Some of the securities were insured, but others were not. Also, investors may have

42. It is easy to make too much of the supposed conflict-of-interest arising from the "issuer pays" business model. The argument that high ratings are "paid for" by issuers does not work for bond ratings, even though issuers pay for those as well. See Hill, *supra* note 16, at 595. Furthermore, it is hard to imagine rating agencies simply allowing issuers and investors to bribe them into giving higher ratings than otherwise warranted. The agencies must deceive themselves to some extent. The alternative is that the rating agencies, in effect, burn their own basements to stay warm during one winter. See *id.* at 596. That being said, the issuer-pays business model should still have prompted investor wariness, especially given the novelty and complexity of subprime-mortgage securities.

43. My interviews with lawyers involved in subprime transactions indicate rating agencies went through certain actions—perhaps rituals—to assess the quality of issuances. People involved in structuring transactions spent considerable amounts of time and effort working with rating agencies to respond to the agencies' concerns and would often make deals more conservative on account of the agencies' demands. Rating agencies are now vilified and depicted as quite corrupt. *E.g.*, Paul Krugman, *Berating the Raters*, N.Y. TIMES, Apr. 26, 2010, at A23. There is evidence showing the extent to which rating agencies revised their models to back into desired ratings, stopped inquiries into the specific characteristics of the mortgages underlying complex securities, and otherwise acted in a manner to reverse market share losses to one another. See SEC. & EXCH. COMM'N, SUMMARY REPORT OF ISSUES IDENTIFIED IN THE COMMISSION STAFF'S EXAMINATIONS OF SELECT CREDIT RATING AGENCIES 13–29 (2008); Abigail Field, *More Hot Emails Put New Heat on the Credit Rating Agencies*, DAILY FIN. (Apr. 23, 2010, 5:20 PM), <http://www.dailyfinance.com/story/investing/more-hot-emails-put-new-heat-on-the-credit-rating-agencies/19452156>. See generally *Wall Street and the Financial Crisis: The Role of Credit Rating Agencies: Hearing Before the Permanent Subcomm. on Investigations*, 111th Cong. (2010) (Exhibits #1c–f) (providing internal rating agency e-mails during the time leading to the financial crisis).

44. Why were investment banks and rating agencies so bad at policing their employees, or "agents"? Firms always run the risk that their agents will benefit themselves at the expense of their firms; this is the classic agency problem discussed at exhaustive length in the literature. It is beyond the scope of this article to analyze in any depth why firms suffered such significant agency problems. The most plausible explanation involves the size of the short-term payoffs that became available to individual agents due to changes in financial engineering and market and institutional structure.

failed to properly investigate the insurers' ability to pay.⁴⁵ The same rationales justifying the prices of subprime securities—low rates of default and steadily increasing housing prices—may have led investors to wildly discount the potential liabilities their insurers were taking on, and the consequent value of their insurance.⁴⁶

What about representations and warranties made by the sellers of the mortgages to the buyers who packaged the mortgages into securities? The representations and warranties made about the quality of the mortgages underlying the subprime-mortgage securities should not have sufficed to “sweeten the lemon.” Some of the entities involved—indeed, many of the loan originators and brokers—had few assets. Some of the entities with deeper pockets qualified their representations by reference to those originally provided by the loan originators and brokers.⁴⁷ Representations from parties without sufficient assets or long-term reputational stakes should not have sufficed to sweeten the lemon.

Finally, the ever-increasing volume of loans and the trajectory of price increases probably should have raised red flags. Investors should have suspected that the volume alone was generating the price increases, even though borrower credit quality was declining. They also should have known that the originating brokers and lenders, who might not be in existence when the loans did or did not perform, were motivated to make their borrowers seem more qualified than they were, or to put the matter more bluntly, to lie to the buyers of the loan about the credit quality of the borrowers. How could investors not have taken all of this into account?

III

AN EXPLANATION

Why didn't subprime investors demand a (much) higher lemons premium? This presents a puzzle under the classic lemons model. Buyers are always wary that they may be buying a lemon. Unless they can become satisfied in the course of a transaction that they are not doing so, they will only offer a low price, demanding a lemons premium. The buyers of subprime-mortgage securities should not have felt satisfied they were not buying a lemon, and the price they paid should have reflected this assessment. But it did not: the buyers paid high, non-lemon prices. The explanation given below as to why they were willing to do so is applicable not just to subprime securities but also potentially to any new financial instrument with a respectable genesis. Under certain

45. See LEWIS, *supra* note 36, at 52; Gretchen Morgenson & Louise Story, *Banks Bundled Bad Debt, Bet Against It and Won*, N.Y. TIMES, Dec. 23, 2009, at A1.

46. See Morgenson & Story, *supra* note 45.

47. My source for this proposition is extensive conversations with leading structured-finance lawyers.

stylized circumstances, the lemons model may not work as simple theory and common sense suggest it should.

The classic lemons model assumes that a seller has full information about whether the car she is selling is a lemon, and that a buyer has less information than the seller. The seller wants to represent the car as a “peach” so she can charge the buyer more money; the buyer, knowing he does not have full information and knowing of the seller’s incentive to exaggerate the car’s quality, is wary and offers a low price. In this model, which stylizes transactions with “fly by night” car dealers, the seller is not concerned with reputation effects. The buyer is not purchasing from her again anytime soon, and she is not constrained by a hope for referrals. The problem is solved once the seller or someone else, an individual or entity with expertise and a financial or reputational stake, can provide credible information, a funded warranty, or some other lemon-sweetening mechanism.

The classic lemons model implicitly envisions one questionable decision—whether to buy a car or not—against a backdrop of settled decisions about other matters. The buyer is not confronted with a significant volume of other important and not-so-important matters for which he needs a decision-making strategy in the face of incomplete information.

Institutional investing differs appreciably from the world of the simple lemons model. Sophisticated professional investors cannot feasibly shun all possible lemons. These investors effectively must buy some financial instruments they do not fully understand—they cannot always “just say no.” They also often will not be able to get complete, or even fairly complete, information, especially for new, complex instruments such as subprime securities. Such information does not exist.

A buyer of subprime securities will, however, get some information from the seller. In contrast to the simple lemons model, the seller’s position is less adverse to the buyer’s. The seller does have a self-serving incentive to inflate the instrument’s value. But the seller’s interest in her reputation and her firm’s reputation somewhat constrains her from selling what she knows to be a lemon. Moreover, many subprime-securities sellers kept some portion of the securities issuances they were selling, providing some evidence that they believed in the quality of the securities.⁴⁸ Still, the seller’s reputational constraint should not be overstated. The uncertainty about the instrument gives the seller and her individual agents “cover” if the instrument turns out badly. And individuals working for the seller may receive a large payoff and leave their positions before the instrument’s defects become known. Indeed, the sellers (investment banks) notoriously have a short-term-oriented bonus structure for their employees. Investment bankers may make enough money in a few years to

48. Alternatively, the sellers could have been willing to lose the value of their investment in order to persuade their buyers to invest. Or they could have been hedging their exposure by buying other instruments that would rise in value if subprime securities fell in value.

retire. On balance, the financial-instrument buyer can rely a bit more on the seller than in the simple lemons model—but not that much more.

The most important difference between the world of institutional investing and that of the simple lemons model is the investor's payoff for his decision. In the simple lemons model, avoiding a bad outcome means not buying a lemon or buying one at a low (lemon) price. In the world of institutional investing, the investor's payoffs are more complicated. His preferred outcome is to perform better than his peers. But his ability to achieve this is limited. His least-preferred outcome is to perform worse than his peers. He can avoid performing worse than his peers by copying them.⁴⁹ Thus, much of the information a prospective buyer might sensibly seek about a novel and complex financial instrument pertains to what other investors are doing. This is not only because the other investors may have some expertise; it is also because the buyer wants an investment others are buying as much as he wants one his best evidence tells him is good. Here, the dynamic being hypothesized is essentially a herd dynamic,⁵⁰ with a twist: when investor *A* buys an instrument because he is aware that investor *B* is doing so, it is not just because *A* thinks *B* knows more than *A* knows. *B*'s purchase is itself information, as to what other investors are likely to do: Other investors are now more likely to purchase the instrument, either because they think *B* has information about the instrument's value or because they take comfort in having company in their purchase,⁵¹ or both. Investors fear that they will suffer if investments they choose do badly. They cannot know the results of their investments; new instruments' results are particularly uncertain. Justification therefore becomes central to the decision-making process. Investors can readily justify having made the same investment decisions as their peers did. The result is herding.

For investors who purchase for their own account, there is an internal analogue of the dynamic described above: the avoidance of regret. Prospective avoidance of regret is a well-documented force in decision-making.⁵² It makes sense that people anticipate the need to justify their decisions made under uncertainty to themselves, and use similar mechanisms to those they might use to justify those decisions to others.

For a period of time after the new instrument is introduced and becomes popular, it performs well for long enough to become "vetted." With subprime securitization securities, there were no difficulties in the short term. For a time, as the market for these securities was taking off, historical default rates on securities comprised of prime mortgages had been exceedingly low. The performance of the underlying subprime mortgages being securitized did not

49. See Hill, *supra* note 39, at 61 n.94; see also Judith Chevalier & Glenn Ellison, *Career Concerns of Mutual Fund Managers*, 114 Q.J. ECON. 389, 389 (1999) ("Direct effects of portfolio composition may also give younger managers an incentive to 'herd' into popular sectors.").

50. See *supra* notes 17–18.

51. Claire A. Hill, *Justification Norms Under Uncertainty*, 17 CONN. INS. L.J. (forthcoming 2011).

52. See *supra* note 21.

suggest difficulties: housing prices were rising, giving people the incentive and ability to refinance their mortgages. People did envision that some housing prices might not continue to rise. However, it was not generally thought that a decline in all geographic markets could occur simultaneously. Moreover, “teaser” rates and other means of keeping early payments artificially low had not yet expired—the time bomb was quietly ticking.⁵³ The volume of securities packaged and sold increased. Not only could many assets be securitized, but some could be securitized more than once,⁵⁴ or securitized “virtually” in synthetic instruments.

Once a new instrument becomes “vetted” and distribution networks are established, the speed at which the “assembly line” moves can make focusing on anything other than the immediate term difficult. All participants in the distribution, including bankers, lawyers, and rating agencies, have strong incentives to keep the assembly line going. They and others on the assembly line are highly paid “cogs in the wheel.” Succeeding at churning out securities requires not questioning the task or product; stopping the line would risk diminishing one’s earnings and perhaps even losing one’s job. This incentive exists not just for the cogs in the wheel—it exists for individuals throughout the organizations involved, including at the top. Consider Chuck Prince’s well-known remark in an interview with the *Financial Times* in July of 2007: “When the music stops, in terms of liquidity, things will be complicated. But as long as the music is playing, you’ve got to get up and dance. We’re still dancing.”⁵⁵ To keep dancing requires not asking some obvious questions: Could the huge volume of loans be driving up housing prices? What will happen when teaser rates expire if refinancing is not possible?

With a ready network (an assembly line moving rapidly), there is demand for the raw materials that make up the product—in this case, the mortgages to be packaged. Not surprisingly, with greater demand, the quality decreases. To make more mortgages, it is eventually necessary to give mortgages to borrowers with progressively worse credit.

Investors should have focused more on this fact, but they did not. Rather than exercising more vigilance or demanding higher risk premiums, the opposite occurred. The spread between interest rates on subprime mortgages and rates on higher-quality mortgages decreased even as the credit quality of the

53. See EDWARD I. ALTMAN, N.Y. UNIV. SALOMON CTR., SPECIAL REPORT: ARE HISTORICALLY BASED DEFAULT AND RECOVERY MODELS IN THE HIGH-YIELD AND DISTRESSED DEBT MARKETS STILL RELEVANT IN TODAY’S CREDIT ENVIRONMENT? 7, 10–11 (2006).

54. The lower-quality tranches of these instruments are bundled together into new securitization securities with their own hierarchy of tranches. The process continues beyond this with CDO³ (CDO cubed). Scott Goodwin, *Next Generation of CDO Repacks in the Works*, SECURITIZATION.NET (June 9, 2003), <http://www.securitization.net/news/article.asp?id=395&aid=2723>.

55. See *Citigroup’s Chuck Prince Wants to Keep Dancing, and Can You Really Blame Him?*, CURIOUS CAPITALIST BLOG (July 10, 2007, 10:15 AM), http://curiouscapitalist.blogs.time.com/2007/07/10/citigroups_chuck_prince_wants/#ixzz0wHLezgVB; see also Langevoort, *supra* note 20 (manuscript at 14).

subprime mortgages declined.⁵⁶ The opposite should have occurred: spreads should have increased. Investors accepted the story that subprime securities were a good investment, knowing that others also believed the story. They did not listen for signs that the music was about to stop.

IV SOLUTIONS?

The mortgage market has largely corrected itself,⁵⁷ indeed, to some extent, it has overcorrected. Would-be borrowers with bad credit (and even some with good credit) are not receiving mortgages.⁵⁸ But the next crisis almost certainly awaits. History demonstrates that lessons learned are not sufficiently generalized. While buyers shun the product on which they lost a great deal of money, their “flight to quality” eventually ends and they return to the search for higher yielding investments. Sellers constantly develop new, often complex, products catering to this search. Investors and sellers can justify optimism that the products maximize return while minimizing risk. With the events occasioning their flight to quality a distant memory, buyers will be attracted to such products. The cycle will begin again.

A correction is inevitable, but many people experience significant pain before it occurs. It is debatable whether policymakers ought to care if investors suffer losses. But policymakers do and probably should care about other bad effects, including some others’ losses and the disruption to the economy. Given present-day financial-engineering capabilities, through which huge volumes of cash are available from global markets and massive notional amounts of securities can be created “synthetically” as bets on the performance of other “real” financial assets, the potential for disruption is increasing at a dramatic rate. If the investors in securitization securities comprised significantly of subprime mortgages had been more skeptical, the “mill” by which so many bad loans originated would have slowed, if not shut down.⁵⁹ The crisis would have been less severe and, perhaps, could have been avoided altogether.

The problems discussed in this article suggest several promising avenues to search for solutions—avenues that complement the recently enacted Dodd–

56. *E.g.*, Demyanyk & Van Hemert, *supra* note 3 (manuscript at 4).

57. One part of the market may not have sufficiently corrected. Investors are continuing to buy re-REMICs, securities made from low-quality tranches of subprime securities. These securities are quite new and they are already being downgraded. *See supra* note 7.

58. *See, e.g.*, Bob Tedeschi, *Less Interest in Interest-Only*, N.Y. TIMES, Mar. 21, 2010, at RE6.

59. Indeed, before securitization of subprime mortgages became popular, the volume of subprime mortgages, and especially those that provided for negative amortization of loans or quick and dramatic resetting of rates, was quite small. *See Coval et al., supra* note 33, at 15. The volume exploded as buyers for these loans emerged in the form of investment banks packaging them into securitization securities. *See* Kristopher Gerardi et al., *Making Sense of the Subprime Crisis*, BROOKINGS PAPERS ON ECON. ACTIVITY, Fall 2008, at 4.

Frank Wall Street Reform and Consumer Protection Act.⁶⁰ One solution is to create incentives against herding behavior by investors. This should benefit not only investors, but also the greater market and other parties affected by excess investor credulity. Investors' skepticism and critical thinking should be encouraged; they should be discouraged from using strategies or justifications that track what others do.⁶¹

How should this be done? Law is in general not ideally suited to the task. It is notoriously averse to policing the substance of business decisions—hence the business judgment rule's deference to the business decisions of corporate officers and directors. Indeed, in the Citigroup case, the court was unwilling to find the corporation's directors liable for having made huge and catastrophic investments in subprime securities: "Citigroup was in the business of taking on and managing investment and other business risks. . . . Oversight duties under Delaware law are not designed to subject directors, even expert directors, to *personal liability* for failure to predict the future and to properly evaluate business risk."⁶²

Perhaps there are legal or extralegal forces that academics can help marshal. Consider in this respect how corporate governance shapes behavior: through threats to impose liability, but also by many extralegal means, including "focus lists," proxy campaigns, and speeches and articles by influential judges and academics.⁶³ Comparable mechanisms might be employed.⁶⁴

Another avenue is for lawyers (and perhaps other parties such as accountants or investment bankers) to take on more of a gatekeeper role. Formulating the specifics of such a policy is fraught with peril. But it seems worth considering how parties involved in structuring securities transactions, who are lending their prestige and reputations, might be motivated to consider the interests of markets more broadly rather than just those of the parties they represent.

A third approach is to focus directly on top managers of investment banks. In this regard, Dodd–Frank requires regulatory agencies to impose prohibitions on financial institutions' incentive-based compensation that might encourage inappropriate risk-taking.⁶⁵ Going further, top managers might be made individually liable for some portion of the damage caused by their banks'

60. Dodd–Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat 1376 (2010) [hereinafter Dodd–Frank].

61. Of course, not every investor can do a full analysis; specialization is necessary if markets are to function properly. But many investors, especially larger investors, can do better: they certainly should not simply rely on the rating agencies, as many now say they did.

62. See *In re Citigroup Inc. S'holder Derivative Litig.*, 964 A.2d 106, 131 (Del. Ch. 2009). Interestingly, Dodd–Frank § 165(h) requires large public financial institutions to have risk committees. Might this effectively overrule *Citigroup*?

63. See Claire Hill & Brett McDonnell, *Executive Compensation and the Optimal Penumbra of Delaware Corporation Law*, 4 VA. L. & BUS. REV. 333, 334 (2009).

64. One example is expressions of disapproval of formulaic safe-harbor practices (such as unthinking and exclusive reliance on rating agencies). See Hill, *supra* note 51 (manuscript at 19–20).

65. Dodd–Frank § 956.

activities.⁶⁶ If top managers share a significant part of the downside risk, they might be less eager to engage in risky activities.

V

CONCLUSION

The subprime crisis would never have occurred had investors not been such enthusiastic consumers of subprime securities. The investors now say, somewhat self-servingly (but probably correctly), that they did not understand the securities—securities for which they were willing to pay very high prices. Investors' willingness to purchase these securities on terms that were favorable to the sellers, and unfavorable to them, presents a considerable puzzle.

Investors do not want to miss out on the next big thing. If the big thing proves disastrous, they will initially flee to quality. But their memories are short, and they will soon resume “chasing yield”—purchasing instruments produced through the latest financial alchemy. Given the externalities that today's financial instruments can produce, it is imperative that someone—whether it is critically minded investors, or appropriate private or public gatekeepers—keeps in mind the following, and is prepared to act on it:

In boom times, new markets tend to outpace the human and technical systems to support them, said Richard R. Lindsey, president of the Callcott Group, a quantitative consulting group. Those support systems, he said, include pricing and risk models, back-office clearing and management's understanding of the financial instruments. That is what happened in the mortgage-backed securities and credit derivatives markets. Better modeling, more wisely applied, would have helped, Mr. Lindsey said, but so would have common sense in senior management. The mortgage securities markets, he noted, grew rapidly and generated high profits for a decade. “If you are making a high return, I guarantee you there is a high risk there, even if you can't see it,” said Mr. Lindsey, a former chief economist of the Securities and Exchange Commission.⁶⁷

66. See Claire Hill & Richard Painter, *Berle's Vision Beyond Shareholder Interests: Why Investment Bankers Should Have (Some) Personal Liability*, 33 SEATTLE U. L. REV. 1173, 1175 (2010).

67. Steve Lohr, *In Modeling Risk, the Human Factor Was Left Out*, N.Y. TIMES, Nov. 5, 2008, at B1.