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CDO RATINGS AND SYSTEMIC INSTABILITY:
CAUSES AND CURE

JOHN CRAWFORD*

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INTRODUCTION

Most analyses of the financial crisis of 2007-2008 assign a large causal role to inflated credit ratings. Credit rating agency reforms enacted under the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank),¹ as well as earlier rule changes implemented by the Securities and Exchange Commission (SEC), address several factors that contributed to inflated ratings, but fail to target the ratings flaw implicated most directly in the crisis. I propose an additional reform to address this flaw.

The flaw lay in ratings of “second-level”² mortgage securitizations: individual mortgages were pooled and securities sold against them, and some of these “first-level” securities were then re-pooled and sold in collateralized debt obligations (CDOs). The structure of the CDO promises steady returns under normal economic conditions, followed by a large loss

1. Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1376 (2010).

2. See Frank Partnoy, *Overdependence on Credit Rating Agencies Was a Primary Cause of the Crisis* 4-7 (Fondazione Eni Enrico Mattei Research Paper Series, Working Paper No. 27, 2009), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1427167## (referring to “first-level” and “second-level” securitizations); Press Release, Bank for Int’l Settlements [BIS] Joint Forum, *Credit Risk Transfer: Developments from 2005 to 2007*, at 6 (July 2008) [hereinafter *Credit Risk Transfer*], available at <http://www.bis.org/publ/joint21.pdf> (referring to “one-layer” and “two-layer” securitizations).

during a period of system-wide stress. The steady returns, abetted by high credit ratings, can provide an illusion of safety and hide the risk of large losses. For this reason, many commentators believe the sale of CDOs should be restricted or banned.³

I argue against banning the construction and sale of CDOs, and instead propose a ceiling on the credit ratings assigned to them. This ceiling would severely hamper CDOs' use in hiding risk without impeding their use for potentially beneficial purposes. While direct restraints on the rating agencies may run up against First Amendment obstacles, the same objective could be achieved through regulation of the sale of CDOs.

This may appear to be a case of closing the barn door when the horse is far afield, as the CDO market has collapsed since the crisis. But memories are short in financial markets. I would argue that a more apt metaphor is that of patching a crack in the dam holding back systemic risk while the river is dry. The fact that risk will eventually find its way to other pressure points in the dam is no reason not to fix the crack we see.

This paper aims first to provide an account of securitization, ratings, and their role in the crisis for the lay reader. With this background, I propose a CDO rating ceiling and explain why it is needed despite other rating industry reforms. Section I supplies several preliminary definitions. Section II provides a brief overview of the structured financial products at the heart of the crisis. Section III describes how these products are rated, and the role and function of ratings in financial markets. Section IV gives an account of the role these products and ratings played in the financial crisis. Section V proposes a rating ceiling and briefly critiques other reforms and reform proposals in light of their effectiveness at addressing ratings' role in the crisis. Section VI proposes an additional reform and concludes.

3. E.g., Nouriel Roubini: *Forget Subprime Mortgages. It's the Subprime Financial System We Need To Fix.*, TELEGRAPH, May 4, 2010, <http://www.telegraph.co.uk/finance/financetopics/financialcrisis/7675641/Nouriel-Roubini-forget-sub-prime-mortgages-Its-the-sub-prime-financial-system-we-need-to-fix.html> ("securities like CDOs . . . must be heavily regulated if not banned. . . . [T]hey don't transfer risk so much as mask it under the cover of esoteric and ultimately misleading risk-management strategies.").

I.

DEFINITIONS

A. *Mortgages*

The mortgages at the heart of the crisis were of two types: subprime and Alt-A. Subprime applies to borrowers with poor credit scores, while Alt-A describes loans with relatively risky underwriting features, such as little or no documentation of income, and high ratios of loan size to home value.⁴

B. *Structured products*

A securitization, or structured financial product,⁵ refers to the aggregation of assets into a “pool,” and the issuance of bonds funded and collateralized by that pool.⁶ A CDO can refer to the securitization of unstructured products, such as corporate loans and bonds (also referred to as collateralized loan obligations or collateralized bond obligations, respectively), or to the securitization of structured products. Structured products that might go into the collateral pool of a CDO include residential mortgage-backed securities (RMBS), which securitize home mortgages; commercial mortgage-backed securities (CMBS), which securitize mortgages on commercial properties; and asset-backed securities (ABS), which securitize various assets such as credit card receivables, student loans, and auto loans.⁷ CDOs that securitize corporate loans or bonds are, like RMBS, CMBS, and ABS, “first-level” securitizations. CDOs securitizing structured products are “second-level” – securitizations of securitizations.⁸ This paper is concerned with the latter category, also referred to as ABS CDOs or structured finance CDOs. Unless otherwise specified, I will use CDO in this paper to refer to structured finance CDOs.

4. Adam B. Ashcraft & Til Schuermann, *Understanding the Securitization of Subprime Mortgage Credit 2* (Wharton Fin. Insts. Ctr., Working Paper No. 07-43, 2008), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1071189.

5. I use “securitization” interchangeably with “structured financial product” or “structured product” in this paper, although a securitization, unlike a structured product, does not necessarily involve a hierarchy of tranches on the liability side. See *infra* Section II.A.

6. This process is described in detail *infra* Section II.A.

7. See *Credit Risk Transfer*, *supra* note 2, app. at 36.

8. See Partnoy, *supra* note 2, at 5-6.

Another type of structured finance CDO is the CDO-squared, which securitizes other CDO tranches. While one occasionally sees references to CDO-cubeds, the collateral for these exponential CDOs was usually a mélange of securities that had gone through varying numbers of securitization iterations.⁹

C. Ratings

The credit rating industry has traditionally been dominated by three rating firms (the “Big Three”): Moody’s, Standard & Poor’s (S&P), and Fitch.¹⁰ They use similar symbolic rating scales to assess the default probability (S&P and Fitch) or expected losses (Moody’s) of debt instruments. The ratings may be thought of as ordinal rankings of credit risk, with Aaa

TABLE 1: MEANING OF CREDIT RATINGS

| Credit Quality | Credit Rating Agency | | |
|------------------------------|----------------------|--------------|-------|
| | Moody’s | S&P | Fitch |
| <i>Investment grade</i> | | | |
| Highest credit quality | Aaa | AAA | AAA |
| High credit quality | Aa1 to Aa3 | AA+ to AA- | AA |
| Strong payment capacity | A1 to A3 | A+ to A- | A |
| Adequate payment capacity | Baa1 to Baa3 | BBB+ to BBB- | BBB |
| <i>Speculative grade</i> | | | |
| Possibility of credit risk | Ba1 to Ba3 | BB+ to BB- | BB |
| Significant credit risk | B1 to B3 | B+ to B- | B |
| High credit risk | Caa1 to Caa3 | CCC+ to CCC- | CCC |
| Default is likely / imminent | Ca | CC, C | CC, C |
| In default | C | SD, D | D |

Source: Financial Crisis Inquiry Commission, *Preliminary Report: Credit Ratings and the Financial Crisis*

9. See, e.g., Anna Katherine Barnett-Hart, *The Story of the CDO Market Meltdown: An Empirical Analysis* 29 (March 19, 2009) (unpublished A.B. thesis, Harvard University), available at <http://www.hks.harvard.edu/m-rcbg/students/dunlop/2009-CDOmeltdown.pdf> (showing “average number of resecuritizations of . . . CDO collateral” for underwriters, “calculated as the weighted average number of CDO repackaging iterations in each underwriter’s CDOs,” and ranging as high as 4.17 for Citigroup and 4.79 for Merrill Lynch).

10. See Lawrence White, *The Credit Rating Agencies and the Subprime Debacle*, 21 CRITICAL REV. 389, 389-91 (2009).

(Moody's) or AAA (S&P and Fitch) the highest, and Ca (Moody's) or C (S&P and Fitch) the lowest before default.¹¹ Table 1 provides the scales used by each agency.

The rating agencies resist the notion that precise probability estimates can be matched to these letter grades,¹² but the growth of structured finance has created the need for such precision to inform the parameter estimates of the CDO rating models. The Big Three now publish historical default rates, or "idealized" default probabilities, for each rating that they use in modeling CDOs.¹³ Ratings agencies have also traditionally claimed that the meaning of ratings is constant across asset classes; one should assume, therefore, that the probability of default for a AAA-rated CDO tranche is roughly the same as for a AAA-rated senior unsecured bond issued by a corporation. While the rating agencies now provide separate rating definitions for different asset classes and issuer types,¹⁴ this is still the standard to which the agencies aspire.¹⁵ Finally, it is worth emphasizing here that ratings are meant to convey only *credit* risk, not other kinds of risk (such as market risk, interest rate risk, or liquidity risk).

11. For ease of exposition, I will use the Fitch scale (AAA, AA, A, BBB) throughout the paper.

12. STANDARD & POOR'S, THE FUNDAMENTALS OF STRUCTURED FINANCE RATINGS 9 (Aug. 23, 2007) [hereinafter STANDARD & POOR'S, FUNDAMENTALS OF STRUCTURED FINANCE RATINGS], available at http://www2.standardandpoors.com/spf/pdf/fixedincome/Fundamentals_SF_Ratings.pdf ("To attach precise expected default rates to any rating category is to imbue the rating process with a degree of scientific accuracy that it could not possibly bear, and which has never been claimed for it.").

13. See John M. Griffin & Dragon Yongjun Tang, *Did Subjectivity Play a Role in CDO Credit Ratings?* 69 (Am. Fin. Assoc. 2010 Atlanta Meetings Paper, 2009), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1364933.

14. See STANDARD & POOR'S, RATING DEFINITIONS (May 3, 2010), <http://www.standardandpoors.com/ratings/definitions-and-faqs/en/us> (follow "Ratings Definitions" hyperlink); MOODY'S, RATING SYMBOLS AND DEFINITIONS (July 2010), http://v3.moodys.com/researchdocumentcontentpage.aspx?docid=PBC_79004.

15. STANDARD & POOR'S, FUNDAMENTALS OF STRUCTURED FINANCE RATINGS, *supra* note 12, at 10.

II. THE PRODUCTS

A. *The products: RMBS and CDOs*

Two types of rated products contributed to the crisis through their poor performance. The first are RMBS, particularly those collateralized by subprime and Alt-A mortgages. Individual mortgages are pooled together into a special purpose vehicle called a real estate mortgage investment conduit (REMIC). The vehicle is created solely to hold the mortgages and issue bonds to investors, and is “bankruptcy remote” from the institution creating it.¹⁶ The REMIC issues bonds in tranches, with more highly rated tranches having repayment priority. The highest-rated tranche of RMBS backed by subprime loans typically constitutes approximately 80 percent of the deal structure.¹⁷ As a simplified illustration, if the total outstanding principal of the mortgages in the collateral pool at the moment of launch is \$100 million, the principal of the AAA-rated RMBS will be \$80 million. Investors will pay \$80 million to buy these bonds, and will accept a relatively low rate of interest (“coupon”), as these bonds will not suffer principal losses until the principal of all lower tranches is exhausted. Investors in lower-rated tranches receive a higher coupon in return for a higher risk of default.

As illustrated in Figure 1, interest paid on the mortgages in the collateral pool is used to make RMBS holders’ coupon payments in a priority “waterfall” each month – first the AAA-rated bondholders receive their coupon payments in full, then the AA-rated bondholders, then the A-rated bondholders, and so on.

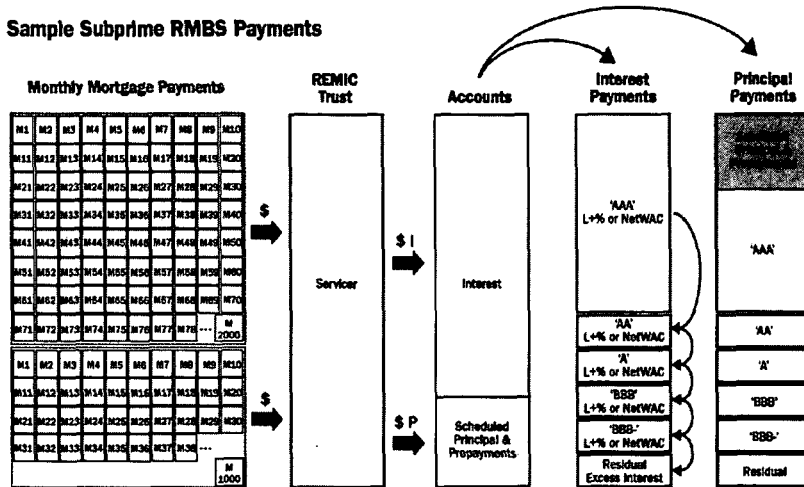
Principal payments go exclusively to the senior tranche for an extended period (usually three years), after which they, too, may be disbursed pro rata, as long as certain threshold

16. “Bankruptcy remote” means that if the REMIC’s sponsor bank files for bankruptcy, its general creditors cannot reach the mortgages held by the REMIC. Similarly, if the mortgages default, the sponsor bank is under no legal obligation to make the RMBS holders whole.

17. Ashcraft & Schuermann, *supra* note 4, at 45.

FIGURE 1: ILLUSTRATIVE FLOW OF PAYMENTS FOR
SUBPRIME RMBS

Sample Subprime RMBS Payments



Source: Gary Gorton, "The (Ongoing) Panic of 2007-2008" (Presentation Slides)

tests (relating, for example, to delinquencies and defaults) are met.¹⁸

The second product at the heart of the crisis was the CDO. The structure of the CDO is similar to that of the RMBS, with several important differences. First, CDO collateral, as noted above, consists not of mortgages or consumer loans, but of other rated securities.¹⁹ Second, CDOs are much less uniform than RMBS. RMBS became largely standardized in the years leading up to the crisis; CDOs were generally custom-built, which made independent analysis more challenging.²⁰ Finally, many CDOs were managed. While RMBS collateral was fixed at the moment of its creation, CDO collateral could often be bought and sold, in accordance with covenanted minimums and maximums as to the credit ratings of acquired collateral and various metrics of diversification.²¹

18. See Gary Gorton, *The Subprime Panic* 6-12 (Yale Int'l Ctr. for Fin., Working Paper No. 08-25, 2008) [hereinafter Gorton, *Subprime Panic*], available at <http://ssrn.com/abstract=1276047>.

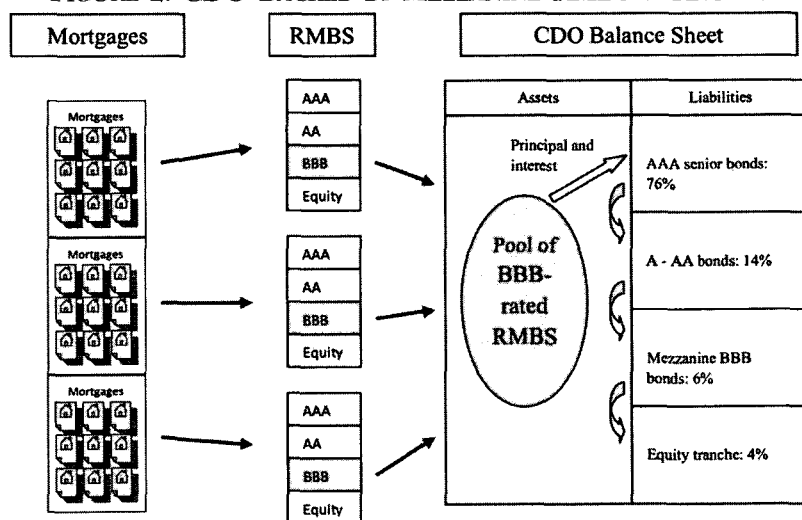
19. *Id.*

20. *Id.*

21. *Id.*

CDO portfolios consisted primarily of junior tranches of ABS and RMBS. The average initial rating of CDO collateral from 2005 through 2007 was A.²² In a sample of more than 3,000 RMBS issued between 2001-2007, the average A-rated tranche of a subprime RMBS would begin to take losses when collateral principal losses reached roughly ten percent, and be completely wiped out when losses approached fifteen percent.²³ In RMBS backed principally by Alt-A mortgages, the A-rated tranche would typically begin taking losses at around five percent, and be wiped out at roughly 6.5 percent.²⁴ Figure 2 illustrates the structure of a Mezzanine CDO backed by subprime mortgages.

FIGURE 2: CDO BACKED BY MEZZANINE RMBS TRANCHES



Source: Financial Crisis Inquiry Commission, *Preliminary Report: Credit Ratings and the Financial Crisis*

CDOs with collateral rated A or above are called “High Grade” ABS CDOs; CDOs with collateral primarily rated BBB are called “Mezzanine,” or “Mezz,” ABS CDOs.²⁵

22. Barnett-Hart, *supra* note 9, at 24.

23. Adam Ashcraft et al., *MBS Ratings and the Mortgage Credit Boom* tbl. 1 (European Banking Ctr. Discussion Paper, 2010), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1615613.

24. *Id.*

25. See generally Gorton, *Subprime Panic*, *supra* note 18, at 13.

In the period from 2005-2007, the issuance of structured finance CDOs tripled, and CDO portfolios became increasingly concentrated in subprime mortgages.²⁶ As illustrated in Table 2, high-grade CDOs, on average, had half their portfolios invested in subprime RMBS, a quarter invested in other RMBS, and almost one-fifth invested in other CDO tranches. More than three-quarters of the average Mezz CDO portfolio was devoted to subprime RMBS, with most of the rest invested in other RMBS or CDOs.²⁷

TABLE 2: TYPICAL COLLATERAL COMPOSITION OF ABS CDOs

| | High grade ABS CDO | Mezzanine ABS CDO |
|---------------|-----------------------|----------------------|
| Subprime RMBS | 50 | 77 |
| Other RMBS | 25 | 12 |
| CDO | 19 | 6 |
| Other | 6 | 5 |

Source: Bank for International Settlements, *Credit Risk Transfer: Developments from 2005 to 2007*

While High-Grade CDOs might seem at first glance a “safer” bet than Mezz CDOs, it is worth noting that their AAA tranches could default after portfolio principal losses exceeded only six percent; Mezz CDO AAA tranches, on the other hand, typically required portfolio losses of more than 19 percent before they were breached.²⁸ ABS CDOs backed at least in part by subprime RMBS tranches doubled from \$77 billion in 2005 to \$150 billion in 2006, and remained above \$100 billion in 2007.²⁹

B. *The logic of tranching*

The principle behind the tranche structure of both RMBS and CDOs is that collateral assets are exceedingly unlikely to default all at once and lose 100 percent of their value. By con-

26. *Credit Risk Transfer*, *supra* note 2, at 5.

27. *Id.*

28. *Id.* at 53.

29. Gorton, *Subprime Panic*, *supra* note 18, at 17.

centrating losses at the bottom of the tranche structure, “safe” bonds can be created from riskier collateral assets. All that is needed is that the bonds be imperfectly correlated. Coval, Jurek and Stafford (Coval et al.) provide a trenchant illustration of this process.³⁰ Assume for two mortgages of equal face value that each has a 0.9 probability of paying off in full and a 0.1 probability of defaulting and paying nothing. Assume further that the mortgages are pooled and two securities of equal face value are issued against the pool, one senior and one junior. For the junior bond to default, it is enough that *either* mortgage defaults. For the senior bond to default, both mortgages must default. In order to determine the default probabilities of the bonds, we must estimate the correlation of the underlying mortgages. Figure 3 illustrates the process if there is no correlation.

In this case, the probability of default for the senior bond will be 0.01,³¹ and the probability of default for the junior bond will be 0.19.³²

As we increase the number of mortgages in the pool, an increasing fraction of the bonds backed by the pool will be “safer” – that is, have a lower probability of defaulting – than the weighted average probability of default of the collateral.³³ Figure 4 illustrates this.

In figure 4 there are three mortgages each with a 0.1 probability of default; assuming no correlation, two of the three resulting bonds backed by the pool have a probability of

30. Joshua D. Coval et al., *The Economics of Structured Finance*, 23 J. ECON. PERSPS. 3, 6-7 (2009), available at <http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.23.1.3>.

31. The joint default probability for two mortgages can be found by the equation:

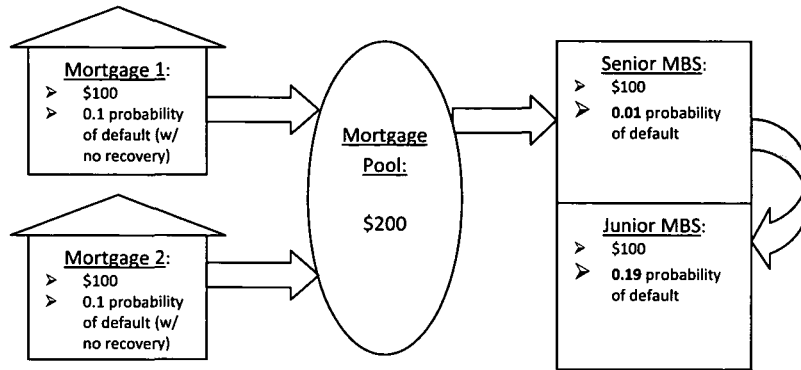
$$P_{1 \text{ and } 2} = P_1 P_2 + \rho_{1,2} (P_1(1-P_1)P_2(1-P_2))^{1/2}$$

where P_1 is the probability of the first mortgage defaulting, P_2 is the probability of the second mortgage defaulting, and $\rho_{1,2}$ is the correlation coefficient for the mortgage defaults. The mathematics of correlation across more than two variables is beyond the scope of this paper, though we draw on its results below. Here, as there is no correlation, the probability of joint default is $0.1 \times 0.1 = 0.01$.

32. A simple and intuitive way to compute this is first to calculate the likelihood that neither bond defaults (0.9×0.9) and then subtract this from 1 to determine the likelihood that at *least* one bond defaults: $1 - (0.9 \times 0.9) = 0.19$.

33. Coval et al., *supra* note 30, at 7.

FIGURE 3: TRANCHED MBS WITH NO CORRELATION ACROSS
(TWO) UNDERLYING MORTGAGES



default less than 0.1.³⁴ This is the process that led to such large percentages of subprime-backed RMBS and mezzanine CDOs being labeled as “safe.”

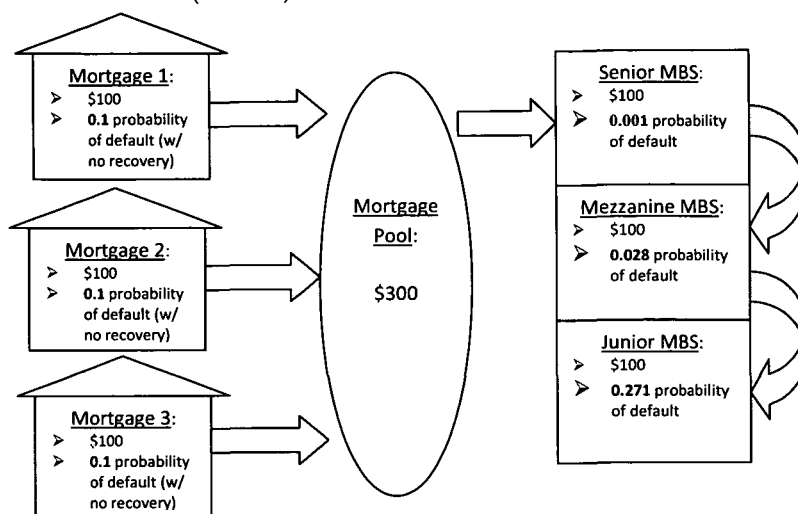
Problems may arise with this structure, however, when mortgage default probabilities are correlated. As the correlation of the underlying collateral performance rises, the risk of default for the senior bond rises, as well. In the polar case, where there is perfect correlation in collateral performance, the default probability for each bond will be the same as for each of the assets in the collateral pool. If the mortgages have a 0.1 probability of default, each bond, regardless of its tranche position, will have a 0.1 probability of default. Tranching will accomplish nothing in this case, and the senior-most bond will be no safer than the junior-most. Section IV.A. below discusses the problems posed by correlation further.

34. As long as defaults are uncorrelated, the likelihood that in a pool of n mortgages, there will be defaults less than or equal to a given number k can be determined by the cumulative binomial distribution function. The formula is:

$$P(X \leq k) = \sum_{i=0}^k \frac{n!}{(i!(n-i)!)} p^i (1-p)^{n-i}$$

where n is the number of mortgages, k is the number of defaults, and p is the probability of default for any given mortgage.

FIGURE 4: TRANCHED MBS WITH NO CORRELATION ACROSS
(THREE) UNDERLYING MORTGAGES



C. *The economics*

Why do we pool and tranche assets into these securitized products in the first place? There are several possible market imperfections to which structured finance responds. These include transaction costs, market segmentation, market incompleteness, and asymmetric information.³⁵ I discuss these each in turn here, but caution at the outset that these are not the only motivating forces in structured finance. Regulatory arbitrage and risk hiding (discussed further in Section IV.A.3) were likely at least as important in explaining the explosion in securitization leading up to the crisis.

1. *Transaction costs*

Some investors may wish to extend their portfolios to sectors and industries to which, absent structured finance, access would be impracticable. Consumer credit and residential

35. Peter M. DeMarzo, *The Pooling and Tranching of Securities: A Model of Informed Intermediation*, 18 REV. FIN. STUD. 1, 2 (2005); Janet Mitchell, *Financial Intermediation Theory and Implications for the Sources of Value in Structured Financial Markets* 12 (Nat'l Bank of Belg., Working Paper No. 71, 2005), available at <http://aei.pitt.edu/5738/01/wp71En.pdf>.

mortgages are prime examples of this. A mutual or pension fund that wanted to invest in residential real estate would not be able to buy portions of individual mortgages; the transaction costs would be prohibitive. By pooling mortgages and selling claims on the pool, structured finance reduces the transaction costs to a point where it becomes practicable for institutions to buy into these sectors.

2. *Market segmentation*

By concentrating losses at the lower end of the tranche hierarchy, structured finance creates “safe” debt at the top of the tranche hierarchy. This creation of safe debt may serve a segment of the market that places a premium on safe debt, due to “restrictions imposed by preferences, investment mandates, or regulation,”³⁶ as well as the need for collateral for derivatives transactions and repurchase (“repo”) agreements. These uses of AAA-rated bonds are discussed in more detail in section IV.b., below. Some commentators argue that there was indeed an “insatiable demand” for safe debt in financial markets.³⁷ The explosive demand for AAA-rated debt could not be met by the U.S. Treasury or the dwindling number of AAA-rated corporations.³⁸ By pooling and tranching, structured financial products created a large number of (seemingly) safe securities out of riskier collateral, helping to meet this demand.

3. *Market incompleteness*

A market where it is not possible to “bet” on a specific contingency is “incomplete.” In a classic statement of the concept, Stephen Ross draws the analogy of a “market where individuals are permitted to purchase a grapefruit only if they also buy an orange. If, by a fluke, everyone wishes to consume one grapefruit with one orange, this constraint has no force. Oth-

36. Mitchell, *supra* note 35, at 12.

37. Ricardo J. Caballero, *The “Other” Imbalance and the Financial Crisis 2* (Nat’l Bureau of Econ. Research, Working Paper No. 15636, 2010), available at http://www.nber.org/papers/w15636.pdf?new_window=1.

38. Gary Gorton, *Slapped in the Face by the Invisible Hand: Banking and the Panic of 2007*, 10-13, 40 (May 9, 2009) (unpublished manuscript) [hereinafter Gorton, *Invisible Hand*], available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1401882.

erwise, opening separate markets would improve efficiency.”³⁹ Ross goes on to describe how options written on “primitive” assets help complete markets. In the context of structured finance, it is possible that pooling and tranching allow investors to gain exposure to particular outcomes that they could not otherwise have gotten based on any pre-existing combination of assets and options. For example, when certain investors wanted to bet that the residential housing market would deteriorate, derivatives (in this case, credit default swaps (CDS)) written on specific tranches of mortgage-backed securities allowed them to target the bets they were making in a way they may not have been able to without those “primitive” assets. Other strategies, such as selling short the shares of construction companies, or of banks with large exposures to the residential mortgage market, would likely have proved imperfect substitutes.⁴⁰

4. *Information asymmetry*

Issuers often have more information about the quality of the collateral of their structured products than investors have. This could create a “lemons” problem if a pool of collateral were not tranching, but rather a pure pass-through vehicle with securities having claims to pro rata shares of the collateral and its cash flow. A lemons problem exists where information is asymmetric as to the quality of a product and sellers cannot credibly communicate high quality to buyers.⁴¹ In a stylized version of a such a market, there are “good” and “bad” products, and (risk-neutral) buyers will pay only the average value of the two types, weighted by the perceived likelihood of getting a good or bad result. So if a (risk-neutral) buyer cannot distinguish product quality ex ante but thinks he has an equal chance of getting a good product worth \$20 or a bad product worth \$10, he will pay up to \$15. This result does not, however, represent an equilibrium; it drives out those selling good products, as buyers will not pay what the product is worth. At the

39. Stephen Ross, *Options and Efficiency*, 90 Q.J. ECON. 75, 75-76 (1976).

40. For an account of how mortgage market bears bet against tranches of mortgage-backed securities, see MICHAEL LEWIS, *THE BIG SHORT* (2010).

41. George A. Akerlof, *The Market for “Lemons”: Quality Uncertainty and the Market Mechanism*, 84 Q.J. ECON. 488 (1970).

limit, only bad products remain and the market for higher quality products collapses.

With a pass-through pool, the seller's retention of a portion of the interest in the pool would not necessarily forestall a lemons market. The good-product/bad-product quandary applies to any portion of the pool the issuer sells. If the pool has 100 assets each worth \$10, and the issuer can convince someone that the average asset value is actually \$11, the issuer can sell an 80-percent interest in the pool for \$880. The issuer is \$80 better off, the buyer has gotten a bad bargain, and the dynamics of the lemons market operate as described above.

There may also be an "ex ante" and an "ex post" aspect to a lemons market in structured finance. The ex ante element involves adverse selection – the possibility that the seller will fill the pool with bad loans. The ex post element involves moral hazard. Moral hazard may be relevant where, for example, the seller retains servicing rights for the loans it has sold, and loan performance depends in part on active monitoring and prompt remedial action in the event of delinquency. Where the seller no longer retains an interest in loan performance, it may not pursue its servicing duties with as much vigor. The moral hazard problem is, of course, larger than information asymmetry, but could contribute to information asymmetry if, for example, investors have difficulty judging exactly how much of an impact the servicer's performance will have on loan performance.

Tranching can solve the lemons problem. Investors in structured products may lack information sufficient to judge the credit quality of an entire pool, but have enough information to feel confident that defaults and losses will not climb above a certain point. (They may also rely on rating agencies in developing this sense of confidence, as discussed below.) By concentrating risk in junior tranches and either holding these tranches or marketing them to a smaller subset of sophisticated investors competent to judge them, structured finance arrangers can sell the senior tranches to less sophisticated or engaged investors without suffering a lemons discount. This dynamic makes tranching essential to the successful marketing of most structured financial products.

5. CDOs vs. RMBS on the economics

The above explanations of structured finance apply with different force to “first-level” securitizations such as RMBS, and “second-level” securitizations such as CDOs. While transaction costs provide a clear rationale for the pooling involved in RMBS, they do not for CDOs. It is as easy for an institutional investor to invest in an RMBS as a CDO. CDOs do not provide access to sectors that it would otherwise be impracticable for investors to access.

Market segmentation does seem to apply to CDOs as much as to RMBS, at least with respect to the large demand of many institutional investors for “safe,” AAA-rated securities. The first level of securitization can produce, say, \$80 million worth of “safe” bonds out of \$100 million worth of “risky” assets; the second level of securitization may take \$10 million of the “risky” junior tranches from the first level and create \$8 million more worth of “safe” debt. It is worth briefly noting here that from 2005 through 2007, the creation of risky tranches at the first level could not keep up with demand, and a number of CDOs were built synthetically through the use of CDS.⁴²

To the degree that structured finance helps to complete markets, it is possible that CDOs could create opportunities for bets that would not otherwise exist, just as RMBS do. Information asymmetry, on the other hand, is less likely to apply to CDOs than to RMBS. This is because CDOs are composed of rated securities. Ratings are easy to understand and are the product of a third-party assessment. Despite the many imperfections of ratings and the ratings process, ratings probably provide investors with enough information to prevent a lemons market, even without tranching. Valuing the consumer loans that constitute first-level securitizations such as RMBS, on the other hand, is much more difficult, with myriad potentially relevant hard and soft variables⁴³ and no comprehensive third-party assessment of each individual loan (though the

42. See *Credit Risk Transfer*, *supra* note 2, at 5.

43. See Uday Rajan et al., *The Failure of Models That Predict Failure: Distance, Incentives and Defaults* 5-6 (Chi. Grad. Sch. Bus. Research Paper No. 08-19, 2010), available at http://www.gsb.stanford.edu/facseminars/event/finance/documents/fin_04_09_seru.pdf (describing the importance of “soft” variables in predicting defaults).

credit bureaus do provide credit scores for the individual borrower). The problem of information asymmetry is therefore likely to be more serious at the first level than at the second level of securitization. Even for an investor who trusts entirely in ratings, some tranching at the first level would likely be necessary to prevent a lemons market. This is because it is virtually certain that there will be *some* losses on a pool of thousands of consumer loans or mortgages. Because any shortfall of promised interest or principal constitutes a default, the credit rating on a pure pass-through pool would necessarily be “likely to default,” which would not help solve the lemons problem. There must be some buffer for a higher rating to attach, which would require, at the very least, an equity tranche whose claimant bears the residual risk.

III.

THE RATINGS

Ratings have been central to structured finance, and despite provisions of Dodd-Frank that will diminish or remove statutory and regulatory reliance on ratings,⁴⁴ they will likely continue to play a key role in the construction and marketing of RMBS and CDOs. In this section we briefly consider the function of ratings in the market, and then examine the mechanics of structured finance ratings.

A. *The functions of ratings*

Ratings are used by regulators and private actors to two principal ends: risk management and promoting capital market efficiency.

1. *Risk management*

Regulators. Regulators have used ratings for decades to prescribe holding and capital requirements for financial institutions and investment funds.⁴⁵ During the years leading up to the crisis, these prescriptions were mandated by a raft of statutory and regulatory references to ratings.⁴⁶ Eligible ratings

44. See *infra* note 48 and accompanying text.

45. See Frank Partnoy, *The Siskel and Ebert of Financial Markets?: Two Thumbs Down for the Credit Rating Agencies*, 77 WASH. U. L.Q. 619, 690–703 (1999).

46. *Id.*

were restricted to those issued by Nationally Registered Statistical Rating Organizations (NRSROs), as designated by the SEC.⁴⁷ The Dodd-Frank Act, however, provides for the removal of a number of statutory references to the rating agencies and orders federal agencies to remove regulatory references over the course of next year.⁴⁸ It is unclear what risk management metrics the federal agencies will use in place of ratings, but they may continue to use ratings as part of a mix of factors to determine creditworthiness in regulating institutional holdings. Many state insurance regulators continue to employ ratings to establish holding and capital requirements for insurance companies.⁴⁹

Investment funds. Money management institutions usually adopt guidelines limiting permissible investments by rating classification. According to a 2007 survey of 200 fund managers and plan sponsors in the United States and Europe, 86 percent of fund managers and 92 percent of plan sponsors explicitly rely on ratings in their investment guidelines.⁵⁰ Ratings-based restrictions are assumed voluntarily by fund managers to resolve a principal-agent problem inherent in the relationship between investor and fund manager. The fund manager takes a cut of any investment gains, but, due to limited liability, suffers truncated losses in the event of an investment turned sour. Because of this, he or she will often have an incentive to take excessive risks from the investors' perspective. The use of ratings-based restrictions limits the risk that fund managers can take on, thus easing investor concerns and aiding fund formation.

47. The Big Three firms were grandfathered in as NRSROs; for many years thereafter it was virtually impossible for other agencies to attain this status. This changed with the Credit Rating Agency Reform Act of 2006, which streamlined the NRSRO registration process for new agencies. There are currently 10 NRSROs.

48. Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203 §§ 939-939A, 124 Stat 1376 (2010).

49. Partnoy, *supra* note 45, at 700-01.

50. Richard Cantor et al., *The Use of Credit Ratings in Investment Management in the U.S. and Europe* 9-10 (Working Paper, 2007), available at <http://ssrn.com/abstract=996133>.

Financial contract counterparties. Private parties to financial contracts often use ratings to control counterparty risk.⁵¹ Downgrades may serve as triggers for contract termination, interest rate adjustments, collateral adjustments, or other actions. For example, AIG's contracts with CDS counterparties called for AIG to post more collateral upon the downgrade of the relevant reference security, and/or upon the downgrade of AIG itself.⁵² When the rating agencies downgraded AIG in September 2008, the company calculated it would have to post \$18 billion in additional collateral to its counterparties, likely pushing it into bankruptcy absent government intervention, all without any actual defaults on the reference instruments for its credit default swaps.⁵³

2. *Capital market efficiency*

In efficient securities markets, a relatively small number of arbitrageurs seeking and trading on information can produce a market price for a security with the character of a public good: it impounds all relevant public information, and unsophisticated investors can generally buy and sell on the same terms as the savviest traders. This pricing function helps guide capital to its most productive uses. To the degree this mechanism holds, it does so primarily in highly liquid secondary markets.⁵⁴

Many debt instruments, however, are traded only thinly or not at all in secondary markets. In these cases, rating agencies may promote efficient allocation of capital in two respects. First, where investors could, with some investigation, satisfy themselves as to a bond's credit quality, reliable ratings prevent duplication of effort among investors. They may also open the market to investors for whom the cost of investigation would otherwise outweigh a bond's attractiveness relative to other investments.

51. See MOODY'S, RATING TRIGGERS IN THE ASSET MANAGEMENT INDUSTRY (2008), http://v3.moody's.com/researchdocumentcontentpage.aspx?docid=PBC_113877.

52. Robert O'Harrow Jr. & Brady Dennis, *Downgrades and Downfalls*, WASH. POST, Dec. 31, 2008, at A1.

53. Carrick Mollenkamp et al., *Behind AIG's Fall, Risk Models Failed To Pass Real-World Test*, WALL ST. J., Oct. 31, 2008, at A1.

54. Gorton, *Invisible Hand*, *supra* note 38, at 9-10.

Second, rating agencies can help issuers avoid lemons markets.⁵⁵ If there are obstacles to issuers communicating high credit quality directly to investors, they may seek to communicate it through a reputational intermediary. Rating agencies may play this role in structured financial products when investors are unable to assess credit quality due to complexity. In such a case, the rating agencies may have sophisticated models for estimating credit risk on which investors might rely. It is therefore worth briefly outlining rating methodologies for RMBS and CDOs.

B. *Rating mechanics for structured products*

To rate both CDOs and RMBS, the rating agencies employ statistical models in order to determine the expected losses on collateral pools, and then model the cash flow from the pool to the tranching securities issued against the pool.⁵⁶ There is, however, a significant difference in the model inputs for RMBS as opposed to CDOs. RMBS models incorporate a large number of variables, such as the loan-to-value ratio of the mortgages, credit scores of the borrowers, debt-to-income ratios of the borrowers, loan seasoning, property type, whether the mortgage was adjustable- or fixed-rate, and geographic diversification.⁵⁷ CDO models incorporate just a few variables: collateral assets' current credit rating, maturity, and asset type.⁵⁸

Based on their models, the rating agencies run a large number of simulations to generate a probability distribution of losses on the collateral pool. Three parameter estimates drive the simulations: collateral default frequencies, recovery rates, and correlations.⁵⁹

The rating agencies have also developed expected default rates for each rating category and maturity. Table 3 provides the expected defaults for AAA-rated CDOs used by each rat-

55. See *supra* Section II.C.4.

56. See *Credit Risk Transfer*, *supra* note 2, at 56-58.

57. FIN. CRISIS INQUIRY COMM'N, PRELIMINARY STAFF REPORT: CREDIT RATINGS AND THE FINANCIAL CRISIS 15-16, (2010) [hereinafter CREDIT RATINGS AND THE FINANCIAL CRISIS], <http://www.fcic.gov/reports/pdfs/2010-0602-Credit-Ratings.pdf>.

58. *Credit Risk Transfer*, *supra* note 2, at 57.

59. CREDIT RATINGS AND THE FINANCIAL CRISIS, *supra* note 57, at 19.

ings firm, derived from historical data. To illustrate the rating process in simple terms, imagine that S&P is analyzing and rating a five-year CDO. How large a portion of the CDO will receive a AAA rating? As Table 3 indicates, S&P expects 0.118 percent of structured finance tranches with AAA ratings and five-year maturities to default. This means it expects such securities to perform as promised 99.882 percent of the time.

TABLE 3: RATING AGENCIES' AAA-RATED EXPECTED DEFAULT RATES FOR STRUCTURED FINANCE⁶⁰

| All in percent | Maturity in Years | | | | | | | | | |
|-------------------|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Fitch Criterion | 0.00 | 0.00 | 0.01 | 0.02 | 0.03 | 0.05 | 0.08 | 0.11 | 0.15 | 0.19 |
| Moody's Criterion | 0.0001 | 0.0002 | 0.0007 | 0.0018 | 0.0029 | 0.0040 | 0.0052 | 0.0066 | 0.0082 | 0.0100 |
| S&P Criterion | 0.000 | 0.009 | 0.030 | 0.065 | 0.118 | 0.190 | 0.285 | 0.405 | 0.552 | 0.728 |

Source: John M. Griffin and Dragon Tang, *Did Subjectivity Play a Role in CDO Credit Ratings?*

S&P will then refer to the probability distribution of losses its model simulations have generated to determine the AAA tranche size. If, for example, expected losses will exceed \$2 million in a \$10 million dollar deal just 0.118 percent of the time, then the AAA tranche size of the deal will be \$8 million (\$10 million - \$2 million). The same process informs the ratings for each tranche.

IV.

THE PROBLEM

A. *The problem with CDOs*

1. *Increased sensitivity*

Structured finance CDOs were constructed from the lower tranches of "first-level" securitizations, with portfolios dominated by subprime RMBS.⁶¹ For subprime RMBS, the principal of the BBB-rated tranches would typically begin taking losses when pool losses exceeded roughly six percent, and would be completely wiped out when pool losses reached ap-

60. Fitch and Moody's refer to these figures as "idealized default probabilities," while S&P refers to them as the expected default rates, but they serve the same function. Griffin & Tang, *supra* note 13, at 69 tbl. A1.

61. *Credit Risk Transfer*, *supra* note 2, at 5.

proximately 9.5 percent.⁶² BBB-rated RMBS tranches backed by Alt-A mortgages would typically take losses when the collateral pool losses reached roughly four percent, and would be wiped out at around five percent.⁶³

The rating agency models that assigned AAA ratings to such large portions of ABS CDOs assumed that defaults were not highly correlated across the mezzanine RMBS tranches that ultimately backed the CDOs.⁶⁴ The problem with this assumption is that the probability of default and default correlations on consumer loans can rise sharply with macroeconomic shocks. Raghuram Rajan, describing building risks in the financial system several years before the crisis, observed that “correlations that are zero or negative in normal times can turn overnight to one” and that as a result “[a] hedged position can become unhedged at the worst times, inflicting substantial losses on those who mistakenly believe they are protected.”⁶⁵ As applied to CDOs, low levels of default correlation for underlying collateral securities protect the senior tranches in normal times. As default correlations rise in a recession, however, the senior tranches become vulnerable. What matters for these senior tranches is not the “average comovement” of assets, but the “worst-case comovement.”⁶⁶ As Coval et al. explain, “the securitization process . . . substitutes risks that are largely diversifiable for risks that are highly systematic. [Such securities] have far less chance of surviving a severe economic downturn than traditional corporate securities of equal rating.”⁶⁷

With respect to mortgages and consumer debt – the foundation of structured finance – job losses and falling asset prices can lead to systematically higher levels of default. Depending on the severity of the downturn, the systematically

62. Ashcraft et al., *supra* note 23, at tbl. 1.

63. *Id.*

64. Note that any RMBS tranche below AAA is considered mezzanine; the fact that CDOs built primarily from AA and A mezzanine tranches were called “high grade” reflects a degree of marketing.

65. Raghuram Rajan, *Has Financial Development Made the World Riskier?* 338 (Nat’l Bureau of Econ. Research, Working Paper No. W11728, 2005), available at <http://www.kansascityfed.org/Publicat/sympos/2005/PDF/Rajan2005.pdf>.

66. *Credit Risk Transfer*, *supra* note 2, at 17-18.

67. Coval et al., *supra* note 30, at 4.

higher default levels may have a small or even no impact on senior tranches of first-level securitizations such as RMBS, since senior tranches draw cash flow from the entire collateral pool in priority to the lower tranches. This protection of the senior tranches comes at the expense of the junior tranches, potentially using up the bulk of the cash flow from non-defaulting mortgages. Consequently, a severe downturn will have a disproportionately large impact on mezzanine tranches of RMBS. Because CDOs are built from these mezzanine tranches, a rise in defaults that does not affect AAA-rated RMBS tranches could completely wipe out an entire CDO pool, including the AAA-rated tranches.

Robert Pozen provides a stylized illustration of this dynamic in his book *Too Big To Save?*.⁶⁸ Imagine 100 bonds of a dollar each are issued against a pool of 100 mortgages, and that each mortgage pays a dollar 95 percent of the time and nothing five percent of the time. Assume their performance is not correlated. The bonds are tranching and numbered so that smaller numbers are at the bottom of the tranche hierarchy. Thus, tranche 1, the riskiest tranche, defaults if *any* mortgage defaults, and tranche 100, the safest tranche, defaults only if every single mortgage defaults. Now assume there are 100 identical RMBS, and tranche 10 from each is pooled into a CDO, with an identical structure to the RMBS. Figure 5 illustrates this structure.

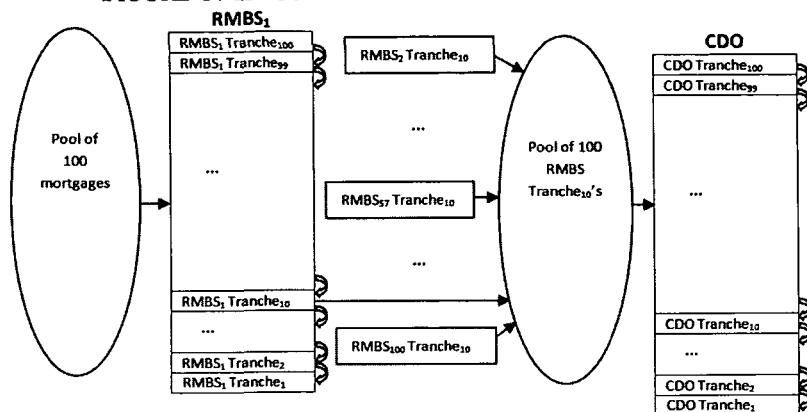
In this hierarchy, tranche 10 of each RMBS defaults 2.82 percent of the time (lower than that of any individual mortgage).⁶⁹ Assuming no correlation among tranche performances across RMBS, Tranche 10 of the CDO, in turn, has a default probability of 0.05 percent.

Imagine now that there is a slight downturn that causes the default rate of underlying mortgages to rise from 5 percent to 6 percent. Because the downturn is widespread, this increase is correlated across all the RMBS, so that each pool has expected losses of 6 percent. As shown in Table 4, the probability of default will rise from 2.82 percent to 7.75 percent for each RMBS tranche 10, but will increase from 0.05

68. ROBERT POZEN, *TOO BIG TO SAVE?* 95-96 (2010). The example is based on a presentation given by Coval et al.

69. This can be computed by the cumulative binomial distribution function. See *supra* note 34.

FIGURE 5: ILLUSTRATIVE RMBS-CDO STRUCTURE



percent to 24.71 percent for the CDO tranche 10. If the downturn is a bit worse, and mortgage default rates jump to 7 percent everywhere, the default probability will rise to 16.2 percent for the RMBS tranche 10 and to 97.19 percent for the CDO tranche 10.

TABLE 4: SENSITIVITY OF RMBS AND CDO CHANGES IN UNDERLYING DEFAULT PROBABILITIES

| Probability of default across all underlying mortgages: | 5 % (baseline scenario) | 6% | 7% |
|---|----------------------------|--------|--------|
| Probability of default for tranche 10 of the RMBS: | 2.82% | 7.75% | 16.2% |
| Probability of default for tranche 10 of the CDO: | 0.05% | 24.71% | 97.19% |

Small baseline errors in the estimation of default risk and correlation can thus have an outsize impact on the second level of securitization. As Coval et al. argue, high ratings for second-level securities were justified only “if the rating agencies were extraordinarily confident about their ability to estimate the underlying securities’ default risks, and how likely defaults were to be correlated.”⁷⁰

70. Coval et al., *supra* note 30, at 3.

We should expect, then, that as the housing market deteriorated, senior tranches of CDOs backed by mezzanine RMBS tranches would wind up performing significantly worse than the senior tranches of RMBS themselves.

2. *Actual performance*

Mortgage-backed CDOs did, in fact, perform worse than RMBS during the crisis. While many RMBS tranches were downgraded, relatively few of the most highly rated tranches have suffered impairment.⁷¹ For example, by the end of 2008, among the 2006-vintage RMBS backed by subprime first-lien mortgages, only 0.1 percent of Moody's AAA-rated tranches had been impaired (by volume), whereas 40.1 percent of AA-rated tranches, 82 percent of A-rated tranches, and 97 percent of BBB-rated tranches had suffered impairment.⁷² Similarly, among 2006-vintage Alt-A RMBS, 0.0 percent of AAA-rated tranches had been impaired by year-end 2008 (by volume), while 13.4 percent of AA-rated tranches, 60.1 percent of A-rated tranches, and 83.3 percent of BBB-rated tranches had suffered impairment.⁷³

In contrast, 100 percent of Moody's AAA-rated high-grade ABS CDOs issued in 2006 had suffered impairment by the end of 2008, as had more than half of the 2006-vintage AAA-rated

71. Impairment can refer to a shortfall in interest or in principal, defined as a rating of Ca (in or very near default) or C (in default with little prospect for recovery of principal or interest). See JULIA TUNG, MOODY'S, DEFAULT & LOSS RATES OF STRUCTURED FINANCE SECURITIES: 1993-2008, 3 (2009) [hereinafter MOODY'S, DEFAULT & LOSS RATES 1993-2008]. Impairment is a surer gauge of credit performance than rating downgrades, given that "the accuracy of credit ratings is highly questionable and downgrades may not translate into actual losses." Barnett-Hart, *supra* note 9, at 35.

72. MOODY'S, DEFAULT & LOSS RATES 1993-2008, *supra* note 71, at 12 ex. 16. As noted above, Moody's notation differs slightly: Aaa is equivalent to AAA, and Baa is equivalent to BBB. For 2005-2007 vintage RMBS (not disaggregated by individual year), Moody's has reported the following impairment rates, as a percentage of the dollar-volume of issuances, as of year-end 2009. For RMBS backed by Alt-A mortgages, 9.9 percent of AAA, 83.3 percent of AA, 92.4 percent of A, and 96.5 percent of BBB tranches have been impaired. For RMBS backed by subprime first-lien mortgages, 4.4 percent of AAA, 52.1 percent of AA, 75.9 percent of A, and 95.5 percent of BBB tranches have been impaired. JULIA TUNG, MOODY'S, DEFAULT & LOSS RATES OF STRUCTURED FINANCE SECURITIES: 1993-2009, 13 (2010) [hereinafter MOODY'S, DEFAULT & LOSS RATES 1993-2009].

73. MOODY'S, DEFAULT & LOSS RATES 1993-2009, *supra* note 72, at 13.

mezz ABS CDOs. This latter figure topped 90 percent by the end of the first quarter of 2009.⁷⁴ (The reason the impairment rate of high-grade CDO senior bonds was higher than for mezz CDO senior bonds is that the AAA-rated tranches of high-grade CDOs typically constituted more than 90 percent of the securitization, whereas the AAA-rated tranches of mezz CDOs typically made up 75-80 percent of the deal value.⁷⁵)

This is consistent with the expectations outlined above. As mortgage defaults rose, principal impairments climbed a little bit up the tranche ladder of RMBS, and very high up the tranche ladder of most CDOs.

3. *Regulatory arbitrage and hidden risk-taking*

I argued earlier that of the market imperfections that structured finance might address, market segmentation and market incompleteness provided possible rationales for CDOs. But there was another likely motivation to the construction of CDOs: regulatory arbitrage. Some commentators believe that the principal use to which structured products were put in the years leading up to the crisis was to allow regulated institutions to assume more risk than they would otherwise be allowed to take.⁷⁶ There was, first, skepticism that rating agencies could accurately capture the risk in RMBS mortgage pools when assigning ratings.⁷⁷ The more common criticisms arise, however, at the CDO level. Critics have, for example, homed in on the well-documented lag in rating migrations and the reliance on RMBS ratings in setting default probabilities when modeling CDOs.⁷⁸ In other words, an RMBS tranche might carry a rating of BBB for an extended period after it becomes clear that its credit quality has deteriorated to “junk.” A CDO may be able to buy such a bond at a discount, but use the BBB default assumptions when creating and obtaining ratings for its own AAA tranche. This means that the AAA tranche will be rated based not only without due regard to the risk of correlated

74. CREDIT RATINGS AND THE FINANCIAL CRISIS, *supra* note 57, at 32, 47.

75. See *Credit Risk Transfer*, *supra* note 2, at 53.

76. See, e.g., Partnoy, *supra* note 2, at 11-12; Roubini, *supra* note 3.

77. See Joseph R. Mason & Joshua Rosner, *Where Did the Risk Go? How Misapplied Bond Ratings Cause Mortgage Backed Securities and Collateralized Debt Obligation Market Disruptions* 3 (Working Paper May 14, 2007), available at <http://ssrn.com/abstract=1027475>.

78. See Partnoy, *supra* note 2, at 4, 8-9.

default, but also with unrealistic assumptions about individual RMBS tranches that comprise the CDO. Such CDOs have a high level of risk but a “super safe” imprimatur from rating agencies. Because these bonds generally offered a premium over other AAA-rated bonds,⁷⁹ they were attractive to regulated fund managers who wanted to increase their yield, and were happy to increase their risk levels to do so, without running afoul of contractual requirements or regulatory restrictions. Their risk level complied with the letter but not the spirit of these restrictions.

This explanation of hidden risk relies on malfeasance or incompetence by the rating agencies and other market actors. There is, however, a more fundamental type of hidden risk that CDOs facilitated: “tail risk.” This refers to the distribution of likely outcomes for senior CDO tranches: perfect performance under most macroeconomic scenarios, and large losses in a crisis (the “tail” of the distribution). Coval et al. describe CDOs as economic catastrophe bonds for this reason.⁸⁰ As Rajan explains in relation to CDS, these sorts of “tail risks . . . produce a positive return most of the time as compensation for a rare very negative return.”⁸¹ Because these sorts of investments display low volatility over extended periods, a portfolio of them can appear to “produc[e] very high alphas (high returns for low risk), so managers have an incentive to load up on them. Every once in a while, however, they will blow up. Since true performance can only be estimated over a longer period, far exceeding the horizon set by the average manager’s incentives, managers will take these risks if they can.”⁸² High CDO ratings facilitated this risk-taking.

While implementation of the Dodd-Frank Act will likely remove many of the incentives for regulatory arbitrage by reducing or eliminating regulatory reliance on ratings, the potential for the risk-hiding use of ratings will persist as long as ratings are used by investment funds as a contractual mecha-

79. See MOODY’S, THE RELATIONSHIP BETWEEN PAR COUPON SPREADS AND CREDIT RATINGS IN US STRUCTURED FINANCE 1 (2005).

80. Coval et al., *Economic Catastrophe Bonds*, 99 AMER. ECON. REV. 628, 628 (2009), available at <http://pubs.aeaweb.org/doi/pdfplus/10.1257/aer.99.3.628>.

81. Rajan, *supra* note 65, at 20.

82. *Id.*

nism to restrict excessive risk-taking, and as long as they are used as a benchmark for comparing fund performance.

B. *The crisis*

The most obvious contribution of CDOs to the crisis was that they contributed an outsize percentage of losses to key financial institutions. One empirical study showed that the best predictor of bank write-downs during the crisis was “the amount of CDOs they issued in 2007, for very few of these CDOs would ever leave the balance sheets of their creators.”⁸³

Financial institution losses, however, wound up being many times larger than actual default losses, leading to bailouts, emergency sales, and bankruptcy. The most cogent explanation of how this occurred views the crux of the crisis as a type of bank run.⁸⁴

1. *The run*

The financial crisis was structurally similar to a classic bank run, but in the “shadow” banking system rather than the traditional banking system.⁸⁵ A run involves an unexpected demand for redemption of a bank’s liabilities. Because these liabilities tend to be short-term (e.g., demand deposit accounts), banks are obliged to comply with these demands. The bank’s assets, however, tend to involve long-term commitments (e.g., mortgages); the bank cannot call in these loans in order to pay off its depositors. A bank’s assets might exceed its liabilities at the beginning of a run, but if it is forced to sell long-term assets into illiquid markets, where prices reflect not fundamentals but banks’ desperate need for cash (“fire sales”), a run could cause major losses and even push the bank into insolvency.

83. Barnett-Hart, *supra* note 9, at 96.

84. See generally Gorton, *Invisible Hand*, *supra* note 38. This explanation of the crisis draws heavily on Gorton’s account.

85. The “shadow” banking system loosely refers to financing functions that were removed from the regulatory framework and restrictions of commercial banking over the past decades.

The problem of commercial bank runs was largely solved with the introduction of deposit insurance in 1934.⁸⁶ Firms or funds with large short-term cash surpluses, however, cannot rely on deposit insurance, as their surplus is usually orders of magnitude larger than the FDIC's individual account insurance cap.⁸⁷ Instead, they regularly "deposit" their money with another financial institution, and receive collateral in return, in a repurchase, or "repo," agreement.⁸⁸ These agreements were an efficient way for financial institutions on the other side of the transaction to fund their short-term cash needs. Repo agreements are generally for a single night, but may be rolled over indefinitely by the parties. In this respect they function very much like demand deposits – the depositor can withdraw its money at any point. The repo market had grown immense prior to the crisis – it is estimated to have been as large \$12 trillion, roughly the same size as the commercial banking system.⁸⁹

The key to the repo market was the perception of collateral as "safe."⁹⁰ There was thus a huge demand for "safe" collateral to facilitate this market – a demand that could not be met by government bonds or by the shrinking ranks of AAA-rated industrial firms.⁹¹ As indicated above, this demand was a primary driver of the structured finance market, and particularly the creation of AAA-rated "second-level" bonds from lower-rated bonds.

In the repo market, a "depositor" (say, a money-market mutual fund) wanted to "deposit" its excess cash in a risk-free

86. See FED. DEPOSIT INS. CORP., A BRIEF HISTORY OF DEPOSIT INSURANCE IN THE UNITED STATES 25-28, (1998), <http://www.fdic.gov/bank/historical/brief/brhist.pdf>.

87. The cap was \$100,000 leading up to the crisis, and has since been raised to \$250,000. See Press Release, Fed. Deposit Ins. Corp., Basic FDIC Ins. Coverage Permanently Increased to \$250,000 Per Depositor (July 21, 2010), <http://www.fdic.gov/news/news/press/2010/pr10161.html>.

88. Gorton, *Invisible Hand*, *supra* note 38, at 4.

89. Gary Gorton, *Questions and Answers About the Financial Crisis* 10 (Nat'l Bureau of Econ. Research, Working Paper No. 15787, 2010) [hereinafter Gorton, *Questions and Answers*] (prepared for the Financial Crisis Inquiry Commission), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1557279.

90. Gorton refers to such debt as "informationally insensitive." Gorton, *Invisible Hand*, *supra* note 38, at 4.

91. See Caballero, *supra* note 37, at 14-15.

vehicle. It did not want to worry about the solvency of the “bank” (say, Bear Stearns) or the value of collateral the bank was providing. In trusting the value of the collateral, depositors relied not on federal insurance, but on rating agencies’ assurance. Sophisticated investors may have been skeptical about the precision of ratings as one moved down the rating scale, and indeed AAA ratings did not demand uniform interest rates,⁹² but there appears to have been a widely accepted belief in financial markets that the AAA rating equaled safety.⁹³

When it became clear that housing prices were going to fall, the market lost faith in ratings on mortgage-backed securities.⁹⁴ Further, market actors knew it was unlikely that credit rating migrations incorporating this new information would be timely, and it started to become clear that AAA-rated CDO tranches might actually default in the near term.

As the market lost faith in the AAA ratings of mortgage-backed securities and CDOs, the repo market came under increasing strain. Depositors either refused to roll over their funds, meaning they withdrew their “deposits,” or they demanded a higher “haircut” on the collateral, meaning more bonds per dollar of “deposit.”⁹⁵ The average haircut on structured finance products jumped from zero in mid-2007 to roughly 10 percent by the end of 2007, and close to 50 percent by the end of 2008.⁹⁶ This amounted to a massive withdrawal

92. This was due to a number of factors. First, a single CDO often contained two (or more) AAA tranches, one junior and one senior, so that the riskier, junior tranche would receive a higher coupon. Second, there were many types of risk other than credit risk that inform a security’s price. See STANDARD & POOR’S, FUNDAMENTALS OF STRUCTURED FINANCE RATINGS, *supra* note 12, at 6. Finally, to the degree that rating agencies were too generous giving AAA ratings to CDOs and the market realized it, investors may have demanded a slight risk premium. These factors may appear to be in tension with the view that AAA ratings equaled safety, but it is possible that there was a sense that securities had to be “safe enough” rather than uniformly safe to be used as collateral, and the AAA rating was a powerful mnemonic threshold for a security’s qualifying “safe enough.”

93. See *Credit Risk Transfer*, *supra* note 2, at 13-14.

94. See Gorton, *Subprime Panic*, *supra* note 18, at 20-26.

95. The “haircut” refers to the percentage difference between the face value of the collateral and the loan size in a repo agreement. If the face value of the collateral is \$100, and the loan is \$95, the haircut is 5 percent.

96. Gorton, *Invisible Hand*, *supra* note 38, at 33.

from the repo system, as assets that once collateralized, say, \$100 million in short-term funding for a shadow bank now supported only a fraction of that amount. Liquid assets were drained from the institutions that played the role of the bank. It was the functional equivalent of a bank run.

Financial institutions were forced to sell assets to meet repo “withdrawals.” Many observers believe that because most prospective buyers were in the same position, market prices collapsed, and securities were sold at fire-sale prices.⁹⁷ Because of mark-to-market accounting rules, this in turn depressed the value of other balance sheet assets, which for regulated financial institutions reduced capital ratios below regulatory requirements and forced further sales, creating a vicious cycle of value destruction.

2. *The role of structured products*

The market lost faith in structured product ratings for two reasons: first, it became clear that the subprime collateral was not worth as much as the face value of the RMBS and CDOs, and, second, there was profound opacity about where the losses were located.⁹⁸

CDOs are more blameworthy than RMBS on both counts. As explained above, AAA-rated tranches of RMBS – the tranches most relevant as collateral – have suffered relatively few impairments relative to AAA-rated tranches of CDOs (though they have been downgraded and suffered mark-to-market losses). Second, CDOs were more opaque to the market. Unlike RMBS, which were largely standardized, CDOs tended to be custom-built. Each had to be modeled separately.⁹⁹ Further, while some RMBS were publicly offered, CDOs were exclusively privately placed, and it was harder to get reliable information on them.¹⁰⁰

CDOs were further culpable because without them, it is unlikely that the RMBS market would have grown to the extent it did, which arguably encouraged mortgage originators

97. See, e.g., Gorton, *Subprime Panic*, *supra* note 18.

98. See *id.* at 26-27.

99. *Id.* at 14.

100. See Richard Tomlinson & David Evans, *The Ratings Charade*, BLOOMBERG MARKETS, July 2007, at 53, available at <http://www.streetfortreasurer.com/articles/01-072007-Toxic-Debt.pdf>.

to push into riskier customer markets, sometimes taking steps to mask the risk. Without CDOs to buy up the lower-rated tranches of subprime RMBS, it is likely that many RMBS deals would never have successfully gone through.¹⁰¹

As a final note on CDOs' role in increasing systemic risk, a huge part of the problem going into the crisis was insufficient capitalization at banks.¹⁰² The effects of the shadow bank run described above were more severe because banks were so thinly capitalized. Many banks used the securitization process, and CDOs specifically, to lower their capital ratio while meeting regulatory requirements.¹⁰³ They could do this by repackaging lower-rated securities into CDOs or CDO-squareds and holding them. Because banks were required to hold less capital against AAA-rated securities than other assets, and because the majority of each repackaged CDO was rated AAA, the total amount of bank capital required to support the identical underlying assets was less than before.¹⁰⁴

While the crisis had a variety of interrelated causes, the role of CDOs and CDO ratings was significant.

V.

PROPOSED REFORM

A. *Ratings ceiling*

1. *The proposal*

I have attempted to explain how structured finance CDOs are vulnerable to large systemic shocks, wherein the "worst-case" co-movement of underlying assets can wipe out the lower tranches of first-level securitizations, and thus the entire structure of second-level securitizations. This vulnerability to systemic risk, abetted by high ratings, was a key causal factor in the crisis.

The market has taken care of this problem for the time being, as structured finance CDO issuance has collapsed since

101. See Mason & Rosner, *supra* note 77, at 69-72 (describing the reliance of RMBS markets on CDOs for the sale of mezzanine tranches).

102. Arnold Kling, *Not What They Had in Mind: A History of Policies That Produced the Financial Crisis of 2008* 6 (Mercatus Fin. Mkts. Working Grp., Working Paper No. 1474430, 2009), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1474430.

103. See *id.* at 68.

104. See *id.*

the crisis.¹⁰⁵ We cannot, however, rely on the market to self-regulate during the next period of market euphoria. In bubble conditions, not just issuers but investors push against the conservatism of gatekeepers such as rating agencies.¹⁰⁶

Many commentators question whether the benefits of CDOs outweigh the costs.¹⁰⁷ A possible implication of this is that CDOs should be banned.¹⁰⁸ I believe that another approach may salvage any net-positive economic function CDOs may serve, while at the same time removing or severely limiting market actors' ability to employ CDOs to hide risk during periods of economic growth. This approach would place strict limits on the rating of any individual tranche of a CDO. It would apply to any re-securitization; in other words, to any structured product that has as collateral other structured products (mortgage-backed or asset-backed securities, or other CDOs), or derivatives referencing those products (such as CDSs). It would still be possible to tranche second-level securi-

105. See SEC. INDUS. & FIN. MKTS. ASS'N (SIFMA), GLOBAL CDO ISSUANCE, <http://www.sifma.org/research/research.aspx?ID=10806> (follow "Global CDO Issuance" hyperlink).

106. See, e.g., JOHN COFFEE, JR., GATEKEEPERS 56 (2006) (explaining with respect to the role of accounting firms that "[i]n a bubble, investors lose their skepticism. . . . In this atmosphere of market euphoria, gatekeepers become irrelevant – or, even worse, shareholders reinforce the pressure on them for the use of risky and/or improper accounting policies in order to sustain hyperbolic earnings growth.").

107. See, e.g., Robert E. Litan, *In Defense of Much, but Not All, Financial Innovation* 35 (Brookings Inst., Working Paper, 2010), available at http://www.brookings.edu/~media/Files/rc/opinions/2010/0217_financial_innovation_litan/0217_financial_innovation_litan.pdf (stating that "it is difficult to imagine a more destructive financial innovation" than the CDO); Alan Murray, *Paul Volcker: Think More Broadly*, WALL ST. J., Dec. 14, 2009, at R.7, available at http://online.wsj.com/article/NA_WSJ_PUB:SB10001424052748704825504574586330960597134.html ("[T]he economy was rising very nicely in the 1950s and 1960s without all of these innovations. Indeed, it was quite good in the 1980s without credit-default swaps and without securitization and without CDOs. I do not know if something happened that suddenly made these innovations essential for growth. In fact, we had greater speed of growth and particularly did not put the whole economy at risk of collapse.").

108. JEROME S. FONS, FONS RISK SOLUTIONS, WHITE PAPER ON RATING COMPETITION AND STRUCTURED FINANCE 12 (2008), available at <http://www.fonsriskolutions.com/Documents/Ratings%20White%20Paper.pdf> ("Even if market forces do not render them extinct going forward, the rating of complex structures should be avoided or prohibited."); Roubini, *supra* note 3.

tizations, but ratings would no longer help hide the vulnerability of senior CDO tranches to systemic shocks.

There are several approaches one could take to implementing these limits, including an outright ban on the highest rating categories for CDOs – forbidding, for example, any CDO tranche, however senior, to receive a rating of AAA and AA. Another approach would be to limit CDO ratings to the weighted average rating of the underlying collateral. In this case, the prudent course would be for the weighted average rating of the *entire* pool of assets to set the ceiling for the senior-most tranche of the CDO. Any approach that would allow the rating of the senior tranche to be greater than the weighted average of the entire underlying pool could invite arbitrage and risk-hiding during the next period of market euphoria.

A potential complication for this approach is that default probabilities do not climb linearly as one descends the rating scale. Table 5 illustrates this with historical default rates for Fitch. As one drops from AAA to AA+ (a one-notch drop), the annualized default rate climbs 0.04 percentage points, from 0.02 percent to 0.06 percent. As one falls from CCC to CC (another one-notch drop), however, the annualized default rate climbs more than eight percentage points, from 6.64 percent to 14.70 percent. The weighting should, therefore, be based on expected default probabilities, and not on linear numerical weighting of ratings notches.

Rating agencies already provide expected default probabilities for each rating, and Dodd-Frank ensures that this will continue by requiring them to do so.¹⁰⁹

To illustrate the difference between the two approaches to calculating the weighted average rating, consider how we would compute this rating for a pool of two one-year bonds with equal face value: one a AAA bond with a default probability of 0.02 percent, and one a BB- bond with a default probability of 2.04 percent. If we counted the rating notches between the two and picked the rating mid-way between them, the result would A- (which otherwise would have a one-year default probability of 0.25 percent). If, on the other hand, we

109. 15 U.S.C. § 78o-7(s)(3)(B)(ii)(II) (West 2006); Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203 § 932(a)(8), 124 Stat. 1376 (2010).

TABLE 5: HISTORICAL DEFAULT EXPERIENCE OF BONDS
RATED BY FITCH

| Rating at issuance | Investment-grade Bonds | | | | | | | | | |
|--------------------------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | AAA | AA+ | AA | AA- | A+ | A | A- | BBB+ | BBB | BBB- |
| 10-year default probability | 0.19% | 0.57% | 0.89% | 1.15% | 1.65% | 1.85% | 2.44% | 3.13% | 3.74% | 7.26% |
| Default rate (annualized) | 0.02% | 0.06% | 0.09% | 0.12% | 0.17% | 0.19% | 0.25% | 0.32% | 0.38% | 0.75% |

| Rating at issuance | Speculative-grade Bonds | | | | | | | | | |
|--------------------------------|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | BB+ | BB | BB- | B+ | B | B- | CCC+ | CCC | CC | C |
| 10-year default probability | 10.18% | 13.53% | 18.46% | 22.84% | 27.67% | 34.98% | 43.36% | 48.52% | 77.00% | 95.00% |
| Default rate (annualized) | 1.07% | 1.45% | 2.04% | 2.59% | 3.24% | 4.30% | 5.68% | 6.64% | 14.70% | 29.96% |

Source: Coval et al., *The Economics of Structured Finance*

computed the average of the two default probabilities, we would get 1.03 percent; we could then find the rating whose default probability most closely matched this, rounding *up* (as rounding down could invite further arbitrage). In this case, that would be BB+, with a one-year expected default probability of 1.07 percent.

Another approach would weigh average expected loss rates rather than default probabilities. This may be preferable to the degree we expect a large variance in the amount of losses given default.

Finally, it would be possible to limit the size of any tranche with a given rating to the value of the underlying collateral with an identical rating. Thus, if AAA-rated bonds made up five percent of the value of the collateral of a CDO, the CDO could issue a AAA-rated tranche not exceeding five percent of the deal value.

These are admittedly blunt tools, but they have the advantage of providing clear guidelines that would be relatively resistant to a slippage in standards during the next bubble. Most importantly, they would prevent the creation of second-level securitizations aimed at creating apparently "safe" debt out of riskier debt. They would force raters to treat the worst-case comovement of junior first-level bonds as what matters. The wisdom of restricting ratings in such a manner, of course, rests on

a judgment that the range of beneficial uses of CDOs is likely very narrow.

2. *Potential concerns*

What do we give up with a CDO rating ceiling?

What might be lost with this approach? Here we may hearken back to the market failures to which, I argue, CDOs may respond. First, there is the creation of “safe” AAA-rated debt to serve a market that places a premium on it. A CDO rating ceiling would significantly impede this function. This should not cause us regret, however, as second-level securitizations that serve this purpose are likely to prove less-than-safe at precisely the moment they are most needed: during a crisis.

The other market imperfection to which CDOs may respond is market incompleteness. Our approach would do nothing directly to impede this response, as ratings are not necessary to any market-completing function CDOs may serve. On the other hand, it is possible that high ratings were necessary for CDO issuance for other reasons, and that a byproduct of CDO creation was completing certain markets. If this is the case, it will be a loss, but one that is probably worth bearing in return for reduced systemic risk.

Would the First Amendment impede a mandatory ceiling?

First Amendment concerns may prevent the direct imposition of a rating ceiling on NRSROs, but it would be possible to achieve the same end by regulating the sale of CDOs.¹¹⁰ For example, if the rule were that CDO ratings cannot exceed the weighted average of the collateral ratings, the SEC could forbid the sale of any structured finance CDO¹¹¹ that has received a rating for which the issuer has paid that exceeds this average. Unsolicited ratings for CDOs require information that is not

110. See, e.g., Letter from Eugene Volokh, Professor, UCLA Sch. of Law, to Members of the House of Representatives Fin. Serv. Comm. (May 15, 2009), at 9, available at http://www.house.gov/apps/list/hearing/financialsvcs_dem/volokh.pdf (explaining that despite First Amendment obstacles to “direct regulation of agency evaluations . . . , Congress could . . . require that various commercial transactions . . . be accompanied with reports that comply with certain guidelines”).

111. Defined as a securitization that includes, or, in the case of managed CDOs, can include in its collateral pool any structured product.

publicly available; as described below,¹¹² the SEC now requires that such information be made available to other rating agencies on a password-protected website. The SEC could further require that any rating agency availing itself of this information agree not to assign a rating to a CDO greater than the weighted average of its collateral.

Could issuers replicate the effects of a CDO at the first level of securitization?

One possible question is whether issuers and rating agencies could reproduce the effect of the CDO market through first-level securitizations. In theory they could, but doing so would likely have to rest on either (a) enormous collateral pools that would be very costly and difficult to assemble, or (b) parameter assumptions so cynically unrealistic that they would invite a harsh regulatory and market response.

In considering this question, we should remind ourselves of what structured finance CDOs did: they pooled junior RMBS tranches, and against this pool they issued new securities, a very high percentage of which were AAA. The first level of securitization turned 80 percent of the dollar value of risky mortgages into AAA bonds. The second level took tranches from the bottom 20 percent, and turned 80-90 percent of these tranches into AAA bonds. After two rounds of securitization, \$100 million worth of subprime mortgages might support more than \$97 million worth of AAA bonds.¹¹³ With repeated rounds of securitization,¹¹⁴ the value of AAA bonds based on a pool of mortgages could asymptotically approach the face value of the underlying mortgages. Indeed, the value of the AAA bonds could exceed the value of the underlying mortgages, as CDOs were built in part from credit default swaps that referenced particular RMBS tranches.¹¹⁵

The CDO process relied on assumptions about imperfect correlation in the credit performance of mezzanine tranches of a wide array of first-level securitizations. One could imagine

112. See *infra* note 130 and accompanying text.

113. See, e.g., Gorton, *Subprime Panic*, *supra* note 18, at 13 (showing tranche size by rating as a percentage of deal size in typical subprime RMBS and Mezz CDO deals).

114. See Barnett-Hart, *supra* note 9, at 29.

115. See *Credit Risk Transfer*, *supra* note 2, at 5.

that instead of, say, 100 RMBS and one CDO, one could construct a single giant RMBS and, using the correlation assumptions that informed the CDO, assign AAA ratings to a tranche or tranches making up, say, 97 percent instead of 81 percent of the entire deal structure. The problem with this is that the correlation assumptions about the mezzanine tranches, to the degree they were at all plausible, rely on types of risk diversification that would be very hard to achieve with one securitization, particularly diversification across vintages (e.g., RMBS tranches of different origination date). Diversification across underwriters would also be more difficult to achieve, though this might be partially offset if the deal were syndicated. With or without this diversification, the warehousing risk of building a first-level asset-backed security of this size would be extremely large. CDOs were typically built from more than 100 securities,¹¹⁶ so the warehousing risk associated with building a giant first-level security to mimic the CDO market would likely be roughly two orders of magnitude greater than the risk associated with any single RMBS deal. In the sample of more than 3,000 RMBS discussed above,¹¹⁷ the average deal size was \$896 million for subprime-backed RMBS, and \$595 million for RMBS backed by Alt-A mortgages.¹¹⁸ The warehousing risk for a monster RMBS, then, could be in the tens of billions of dollars. This would make it a significantly more costly and less attractive venture, even to a consortium of underwriters.

If, on the other hand, rating agencies relaxed their parameter assumptions and assigned AAA ratings to a much higher percentage of a typical RMBS deal, it would be relatively clear that the agency had eschewed any aspirations toward quality, and much easier for the market and regulators to respond in real time. First-level securitizations, while complex, are significantly more transparent than CDOs, and it would be much more difficult for the rating agencies to justify assigning AAA ratings to, say, 97 percent of a subprime RMBS issuance. Again, part of the reason that AAA-rated CDO tranches were attractive was that they *hid* risk.

In any event, first-level securitizations have a clear economic rationale; they will continue to be rated, and it is usually

116. Barnett-Hart, *supra* note 9, at 106.

117. See *supra* note 23 and accompanying text.

118. Ashcraft et al., *supra* note 23, at tbl. 1.

justifiable for a substantial portion of each such securitization to receive the highest rating. It is better to try to encourage quality ratings for these instruments in other ways. The rationale for CDOs is weaker, and their sensitivity to parameter assumptions significantly greater. For CDOs, a hard and fast rule makes more sense.

Is a rating ceiling needed given other reforms?

A final key question is whether this reform is needed, given the many reforms affecting rating agencies in the Dodd-Frank Act, earlier SEC rule changes, and other reform proposals put forward by critics. Below I explain why a rating cap for structured finance CDOs is a useful supplement to the other reforms, proposed or enacted.

B. Other proposals

A number of credit rating agency reforms have been enacted, and others proposed, since the onset of the crisis. These reforms address important flaws in the ratings process, some of which exacerbated overly optimistic ratings in structured finance, but none targets the specific problem of CDOs. Here I briefly discuss credit rating reform efforts categorized by the perceived problems they attempt to address.

1. Conflict of interest

The majority of proposals and reform efforts have focused on the conflict of interest inherent in the rating agencies' business model: the agencies are paid by the firms whose bonds they rate.¹¹⁹ Issuers want to see higher ratings for their bonds as it lowers their cost of capital,¹²⁰ and may exert pressure on rating agencies to inflate their ratings. Credit rating agencies' reputational concerns should, theoretically, steel them against such pressure, but the drive to expand market share and to

119. See, e.g., SUMMARY REPORT OF ISSUES IDENTIFIED IN THE COMMISSION STAFF'S EXAMINATION OF SELECT CREDIT RATING AGENCIES 23 (July 2008), <http://www.sec.gov/news/studies/2008/craexamination070808.pdf>.

120. It may do so in two ways. First, buyers may believe the rating, perceive lower credit risk, and pay more for the bonds. Second, regardless of whether they believe the rating or not, higher ratings may, at certain trip points, expand the market to institutions that face rating-based holding and capital requirements.

generate short-term profits may trump longer-term reputational concerns.¹²¹

There are two principal types of reform that aim to address this conflict of interest. First, some reforms try to counteract the effects of the conflict by increasing the cost of inaccuracy, particularly through increasing rating agencies' exposure to liability.¹²² Second, some proposed reforms would eliminate the conflict by changing the rating agency business model.¹²³ While addressing the rating agencies' conflict of interest is important, and some of these reforms may be worth implementing, they are insufficient as a response to the CDO problem this paper has outlined. Our concern is to prevent the explosion of CDOs during the next asset bubble; decades of steady performance in a given ABS class could reduce wariness about a shock or a "worst-case" scenario, and *good-faith* (rather than venal) assumptions that prove slightly off about default probabilities and correlations could again have disastrous consequences for senior bonds at the second level of securitization. Addressing the conflict of interest will not prevent this, but a limit on CDO ratings could.

2. *Regulatory licensing*

Perhaps the most profound reform enacted by Dodd-Frank is the immediate removal of references to rating agencies from a number of federal laws, and its prescription that federal agencies remove regulatory references to ratings within 12 months.¹²⁴ This jibes with a view held by some critics that rating agencies' primary function is to provide regulatory

121. See FONS, *supra* note 108, at 2 ("It is argued that building a stellar reputation requires a long-term horizon and view. Yet managers of publicly owned rating agencies are subject to intense short-term pressure to demonstrate earnings growth. It takes tremendous discipline to turn away business, particularly when competitors are building market share.").

122. See, e.g., 15 U.S.C. § 78u-4 (West 2006); Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203 § 933(b) (2010) (lowering the scienter element of the pleading standard against rating agencies in private securities fraud cases).

123. See, e.g., Dodd-Frank Wall Street Reform and Consumer Protection Act § 939F (2010). This provision directs the SEC to study the feasibility of setting up a clearinghouse that would receive payments from issuers, and channel assignments and payments randomly to pre-selected ratings agencies.

124. *Id.* § 939A.

licenses, not to serve as reputational intermediaries.¹²⁵ Because ratings have been used so heavily in regulation to prescribe what investors may hold, issuers have had to hire the rating agencies in order to sell their debt, regardless of the informational content of ratings. If this view is correct, reforms that assume the continued use of ratings in regulation are a waste of time. Stripping references to the rating agencies from laws and regulations is necessary to force rating agencies to function legitimately as reputational intermediaries or to die. If investors do not trust rating agencies, and have no regulations to try to game, they will not pay a premium for bonds rated by the agencies, and issuers will see no reason to hire them in the first place. This, in turn, will make rating agencies guard their reputations much more jealously.

While Dodd-Frank greatly reduces regulatory reliance on ratings, issuers and investors will likely continue to have incentives to push for or wink at inflated ratings, for several reasons. First, many state regulators will continue to rely on ratings. Second, even if, for example, money market mutual funds no longer have to refer to ratings to determine their holding requirements, the boards of these funds will likely continue to refer to them voluntarily, if for no other reason than to minimize their own risk of liability. Finally, ratings remain a key factor in private contractual arrangements to control risk-taking by fund managers and to manage counterparty risk.

More generally, removing references to ratings may address problems with the rating process arising out of complacency, but again, it will not prevent minor estimation errors, made in good faith, that the CDO structure amplifies. This is where a rating ceiling can fill the gap.

3. *Lack of competition*

Some critics believe the Big Three credit rating agencies have been sheltered from concerns about reputation because they constitute an oligopoly, with significant entry barriers. Views have differed on how much this oligopoly was due to regulation, and how much to “natural” economic forces, as it was extraordinarily difficult to attain NRSRO status prior to

125. See Partnoy, *supra* note 45, at 681-686.

the Credit Rating Agency Reform Act of 2006.¹²⁶ At least in the field of structured finance, the recent success of Dominion Bond Rating Services (DBRS), which attained NRSRO status in 2007,¹²⁷ has cast doubt on the idea of a natural oligopoly. DBRS's market share of the mortgage-backed security market, non-existent prior to the crisis, climbed to 18 percent in 2008, and 41 percent in 2009.¹²⁸ Moody's share, meanwhile fell from 40 percent in 2008 to 6 percent in 2009.¹²⁹

Those who nonetheless believe features of oligopoly persist often call for increased competition in the rating industry. The problem with this, particularly for CDOs, is that increased competition could lead to a "race to the bottom" rather than the top, as rating agencies compete for business by offering higher ratings to larger CDO tranches than other agencies.¹³⁰ Particularly in a bubble, when vigilance is low and fund managers are less circumspect about trying to goose returns, the existence of more rating agencies would likely provide structured finance issuers with more chances to increase AAA tranche sizes, exacerbating the problem with CDO ratings. This, in turn, raises questions about the practice of rating shopping.

126. See 17 C.F.R. § 240.17g-1 (2007) (streamlining the registration process for NRSROs).

127. Order Granting Registration of DBRS Limited as a Nationally Recognized Statistical Rating Organization, Exchange Act Release No. 34-56508, 2007 SEC LEXIS 2187 (Sept. 24, 2007).

128. Aaron Lucchetti & Serena Ng, *Still Broken: "Ratings Shopping" Lives on as Congress Debates a Fix*, WALL ST. J., May 24, 2010, at A1.

129. *Id.*

130. A race to the top would mean that competition improved ratings quality; a race to the bottom would mean competition would harm ratings quality. Both outcomes are plausible. A study of the impact of Fitch breaking into corporate bond rating market in 1990s has shown that average rating quality declined. Bo Becker & Todd Milbourn, *Reputation and Competition: Evidence from the Credit Rating Industry* (Harv. Bus. Sch., Working Paper No. 09-051, 2009), available at <http://www.hbs.edu/research/pdf/09-051.pdf>. But see Neil A. Doherty et al., *Does Competition Improve Ratings?* (Sept. 14, 2006) (unpublished manuscript), available at http://www.pfp.gsu.edu/Research/downloads/Phillips_RA_insurance.pdf (showing that when S&P broke into the previously niche insurance rating market, challenging monopolist rater AM Best, average rating quality improved).

4. *Rating shopping*

An issuer may “shop” for a rating by determining what rating an agency would assign to a particular debt issuance – either by paying the agency for a preliminary opinion or running numbers through a publicly available rating agency model – and paying for publication of only the highest rating or ratings. Rating shopping constitutes a principal vehicle of the race-to-the-bottom scenario, and is key to explaining why the issuer-pays conflict of interest might have pernicious effects with respect to RMBS and CDOs. It deserves to be treated separately from the conflict of interest issue, however, because even absent conscious decisions or bad modeling by the rating agencies, rating shopping might lead to inflated ratings. To the degree that greater complexity leads to greater variance in the evaluation of credit risk, and as long as there is not a systematic conservative bias in the varied evaluations, choosing the highest rating will lead to systematically inflated ratings.¹³¹

Rating shopping likely led to larger AAA tranches for CDOs than would otherwise have been the case.¹³² The SEC recently attempted to address rating shopping by facilitating unsolicited ratings of structured financial products, so that firms that have been passed over for a rating can still express their views on an offering.¹³³ If rating shopping can be successfully prevented, it would dampen bad-faith or venal ratings actions by the agencies, but it would be unlikely to kill them off entirely, especially in the “repeat game” that structured finance has become.¹³⁴ Nor would the prevention of rating shopping affect good faith ratings during bubbles that innocently ignore the tail risk of a product like the CDO. Again, a CDO ceiling would provide a valuable supplemental safeguard

131. Vasiliki Skreta & Laura Veldkamp, *Ratings Shopping and Asset Complexity: A Theory of Ratings Inflation* (N.Y. Univ. Stern Sch. Of Bus., Working Paper, 2008), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1295503 (describing a dynamic similar to that of the “winner’s curse” in auction theory, where imperfect information leads to a dispersion of bid levels around the actual value of the item up for sale, so that the winner always bids too much); see also Richard Thaler, *Anomalies: The Winner’s Curse*, 2 J. ECON. PERSPS. 191 (1988).

132. See Griffin & Tang, *supra* note 13, at 20.

133. See 17 C.F.R. § 240.17g-5 (2007).

134. In other words, rating agencies could bend at the threat of losing not the current deal, but future deals.

to help prevent hidden risk from building during the next market euphoria.

CONCLUSION

While conflicts of interest, regulatory arbitrage, lack of competition, and rating shopping may have helped drive inflated CDO ratings, this was not the fundamental problem with CDOs. The fundamental problem with structured finance CDOs is their sensitivity to baseline parameter assumptions, and their “all-or-nothing” character – paying off with a probability approaching 1 in normal times, while losing a huge portion of their value in a systemic crisis.

Placing a ceiling on the ratings a structured finance CDO can receive would impede its use as a way to hide tail risk, or to exploit poor quality or outdated ratings of first-level securitizations. A rating ceiling is probably better than an outright ban, as it allows the use of CDOs to the degree that they serve a legitimate purpose, while limiting their pernicious effects. Imposing a ceiling on structured finance CDO ratings is not a silver bullet, but it could prove an effective way to limit risk and to help avoid systemic crises in the future.

