The Promise and Perils of Credit Derivatives

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Abstract

In this Article, we begin what we believe will be a fruitful area of scholarly inquiry: an in-depth analysis of credit derivatives. We survey the benefits and risks of credit derivatives, particularly as the use of these instruments affect the role of banks and other creditors in corporate governance. We also hope to create a framework for a more general scholarly discussion of credit derivatives.

We define credit derivatives as financial instruments whose payoffs are linked in some way to a change in credit quality of an issuer or issuers. Our research suggests that there are two major categories of credit derivative. First, a credit default swap is a private contract in which private parties bet on a debt issuer's bankruptcy, default, or restructuring. For example, a bank that has loaned $10 million to a company might enter into a $10 million credit default swap with a third party for hedging purposes. If the company defaults on its debt, the bank will lose money on the loan, but make money on the swap; conversely, if the company does not default, the bank will make a payment to the third party, reducing its profits on the loan.

Second, a collateralized debt obligation (CDO) is a pool of debt contracts housed within a special purpose entity (SPE) whose capital structure is sliced and resold based on differences in credit quality. In a "cash flow" CDO, the SPE purchases a portfolio of outstanding debt issued by a range of companies, and finances its purchase by issuing its own financial instruments, including primarily debt but also equity. In a "synthetic" CDO, the SPE does not purchase actual bonds, but instead enters into several credit default swaps with a third party, to create synthetic exposure to the outstanding debt issued by a range of companies. The SPE finances its purchase by issuing financial instruments to investors, but these instruments are backed by credit default swaps rather than any actual bonds.

In the Article's first substantive part, we discuss the benefits associated with both types of credit derivatives, which include increased opportunities for hedging, increased liquidity, reduced transaction costs, and a deeper and potentially more efficient market for trading credit risk. We then discuss the risks associated with credit derivatives, such as moral hazard and other incentive problems, limited disclosure, potential systemic risk, high transaction costs, and the mispricing of credit. After considering the benefits and risks, we discuss some of the implications of our findings, and make some preliminary recommendations. In particular, we focus on the issues of disclosure, regulatory licenses associated with credit ratings, and the special treatment of derivatives in bankruptcy.

THE PROMISE AND PERILS OF CREDIT DERIVATIVES

Frank Partnoy & David A. Skeel, Jr.*

I. INTRODUCTION

A decade ago, the transfer and pricing of credit was straightforward. The typical credit relationship was between an individual or corporate manager and the lending officer of a bank, and the typical credit instrument was a loan. Lawyers for the parties looked to standardized loan documentation in their negotiations, and the interaction of borrowers and lenders determined material terms, such as covenants, amortization schedules, and interest rates. Individuals, small businesses, and large public corporations used credit instruments that were virtually identical in form and substance.

Today, these practices continue for many individuals and small businesses. But for most public companies, the credit markets are no longer so simple. The typical credit relationship today is between sophisticated risk managers. Companies still obtain funds through "plain vanilla" securities issues and loans, but increasingly turn to hybrid instruments and derivatives in their financings.

Financial intermediaries, particularly banks, no longer necessarily serve as monitors and risk bearers. Instead, intermediaries use new instruments known as credit

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derivatives to shift risks to other parties. In this article, we assess the benefits and costs associated with this disintermediation.

Credit derivatives play an increasingly important and controversial role in financial markets. Commentators have labeled credit derivatives good or evil: some have lauded them for enabling banks to hedge credit risks while others have warned of hidden dangers and systemic risks.[1] Institutions have both saved and lost fortunes using credit derivatives.[2] Meanwhile, the market for credit derivatives has grown from virtually nothing a decade ago to the range of $20 trillion of notional value in 2006.[3] The market for credit derivatives is now one of the largest markets in the world.

Yet the academic literature has largely ignored these instruments. In this essay, we begin what we believe will be a fruitful area of scholarly inquiry: an in-depth analysis of credit derivatives. We survey the benefits and risks of credit derivatives, particularly as the use of these instruments affects the role of banks and other creditors in corporate

[1] See, e.g., Alan Greenspan Speech (concluding that credit derivatives "appear to have effectively spread losses from defaults by Enron, Global Crossing, Railtrack, WorldCom and Swissair in recent months from financial institutions with large short-term leverage to insurance firms, pension funds, or others."); Warren Buffett 2003 Letter to Berkshire Hathaway Shareholders (warning of the dangers of credit derivatives, and calling derivatives "time bombs" and "financial weapons of mass destruction"); Howard Davies, the outgoing head of Britain's Financial Services Authority (calling synthetic collateralized default obligations "the most toxic element of the financial markets").

[2] Banks used credit derivatives to hedge approximately $8 billion of risk associated with Enron debt and $10 billion of risk associated with WorldCom debt, thus avoiding massive losses when those two companies defaulted. Conversely, numerous companies have announced substantial losses on credit derivatives. See, e.g., Frank Partnoy, Infectious Greed 390-91 (describing American Express's $826 million loss on CDOs).

[3] See, e.g., ISDA 2005 Year-End Market Survey, available at http://www.isda.org (noting that "[c]redit default swaps grew 38 percent from $12.4 trillion to $17.1 trillion"). Collaterized Debt Obligations also are a multi-trillion dollar market.

governance. We also hope to create a framework for a more general scholarly discussion of credit derivatives.

We define credit derivatives as financial instruments whose payoffs are linked in some way to a change in credit quality of an issuer or issuers. Our research suggests that there are two major categories of credit derivatives, and we analyze each type separately.

First, a credit default swap is a private contract in which private parties bet on a debt issuer's bankruptcy, default, or restructuring. For example, a bank that has loaned $10 million to a company might enter into a $10 million credit default swap with a third party for hedging purposes. If the company defaults on its debt, the bank will lose money on the loan, but make money on the swap; conversely, if the company does not default, the bank will make a payment to the third party, reducing its profits on the loan. Like other derivatives, credit default swaps can be used not only for hedging, but also for speculation or arbitrage. Credit default swaps have grown from a small private market in the early 1990s[4] to a liquid, standardized market today.

Second, a collateralized debt obligation (CDO) is a pool of debt contracts housed within a special purpose entity (SPE)[5] whose capital structure is sliced and resold based on differences in credit quality. In a "cash flow" CDO, the SPE purchases a portfolio of outstanding debt issued by a range of companies, and finances its purchase by issuing its own financial instruments, including primarily debt but also equity. Credit rating agencies rate the various tranches of the SPE's debt, whose terms vary depending on

[4] Mark Parsley, Credit Derivatives: You Ain't Seen Nothing Yet, Euromoney, December 1997, p. 72.

[5] The SPE can be a trust, company, or other legal entity, and typically is domiciled within a tax or regulatory haven.

seniority. In a "synthetic" CDO, the SPE does not purchase actual bonds, but instead typically enters into several credit default swaps with a third party, to create synthetic exposure to the outstanding debt issued by a range of companies. The SPE then issues financial instruments, which are backed by credit default swaps rather than any actual bonds.

In Part II, we discuss the benefits associated with both types of credit derivatives, which include increased opportunities for hedging, increased liquidity, reduced transaction costs, and a deeper and potentially more efficient market for trading credit risk. In Part III, we discuss the risks associated with credit derivatives, such as moral hazard and other incentive problems, limited disclosure, potential systemic risk, high transaction costs, and the mispricing of credit. In Part IV, we discuss some of the implications of our findings, and make some preliminary recommendations. In particular, we focus on the issues of disclosure, regulatory licenses associated with credit ratings, and the special treatment of derivatives in bankruptcy.

II. THE BRIGHT SIDE OF CREDIT DERIVATIVES

It is no accident that the growth of the credit derivatives markets has been exponential since the market emerged roughly two decades ago. Credit derivatives offer a wide range of benefits for the banks that lend to large corporate borrowers, for companies that wish to issue bonds and others. In this part, we outline the major benefits. We start with credit default swaps, and then turn to Collateralized Debt Obligations.

A. The New Vistas Opened by Credit Default Swaps

In his final years as chairman of the Federal Reserve, Alan Greenspan waxed eloquently about the virtues of credit derivatives in general, and credit default swaps in particular. They are essential to the stability and flexibility of the American economy, he argued.[6] The most obvious reason is that credit default swaps provide a simple device for banks and others to hedge the risks associated with a particular company or group of companies. This section begins by considering the hedging benefits, the most familiar virtue of credit default swaps. We then outline several additional benefits, including increased liquidity in the credit markets, contractual standardization, and the valuable signals provided by credit derivatives for other market participants.

1. Using Credit Defaults to Hedge Risk

Imagine a bank that has agreed to lend several hundred million dollars to a large corporate borrower such as General Motors. If the bank wishes to reduce its exposure, one option is to syndicate the loan so that the bank only provides a portion of the funds. This, of course, is a strategy that banks regularly use. But negotiating the syndication and

[6] "Two years ago at this conference," he recalled at a 2005 conference at the Federal Reserve Bank of Chicago, "I argued that the growing array of derivatives and the related application of more-sophisticated methods for measuring and managing risks had been key factors underlying the remarkable resilience of the banking system, which had recently shrugged off severe shocks to the economy and the financial system." Alan Greenspan, *Risk Transfer and Financial Stability* (Remarks to the Federal Reserve Bank of Chicago's Forty-first Annual Conference on Bank Structure)(May 5, 2005), available at http://www.federalreserve.gov/Boarddocs/Speeches/2005/20050505/default.htm. Greenspan also noted some of the risks of credit derivatives, many of which are discussed in Part III, *infra*.

working with a group of other banks introduces significant new costs, and also requires the bank to share the benefits of a potentially profitable lending relationship. If the bank would rather oversee the loan itself (or minimize the size of its syndicate), credit default swaps provide an alternative method for laying off some of the risk. By purchasing credit default swaps, the bank can handle the loan and lending relationship itself, and reduce the potential downside costs of a default by the borrower.

Not only can credit default swaps be used to meter the lender's exposure to a particular borrower, they also can be combined with multi-issuer swaps or other derivatives to create almost any desired risk profile. If the lender wishes to bear a borrower's firm specific default risk, but not risk related to the industry as a whole, for instance, it could purchase derivatives that would compensate the lender in the event of an industry downturn (such as a derivative linked to the stock prices of a broad group of companies in the industry).

If these techniques are used by numerous banks in numerous lending relationships, they offer system-wide benefits. Alan Greenspan and others have argued that credit derivatives served as a shock absorber during the corporate crisis of 2001 and 2002. Because many of the lenders to companies like Enron and WorldCom had hedged their risk, the corporate scandals did not spread to the banking industry. By limiting their exposure, banks averted what could have been a parallel wave of banking failures.[7] These systemic benefits are so important, in Greenspan's view, that Congress should eschew regulation so that the market will remain unfettered and continue to grow. "[T]he history of the development of these [credit derivative] products," as he put it,

[7] *See supra* note [6].

"encourages confidence that many of the newer products will be successfully embraced by the markets."[8]

Others have suggested that the hedging opportunities afforded by credit derivatives and other risk management techniques are transforming the banking industry. Banks have begun shedding ordinary risks such as interest rate risk in order to focus on more complex, borrower specific risk that they have a particular advantage in assessing and monitoring.[9] This, too, could bring important benefits, such as more focused monitoring of corporate borrowers.

2. Liquidity and Access to Capital

Because credit default swaps enable banks to lend at lower risk, these contracts increase liquidity in the banking industry. The effect is analogous to the influence securitization has had on home mortgage lending. In the three decades since Fannie Mae first began purchasing mortgages from banks, and selling interests in portfolios of mortgages, mortgage lending has soared.[10] The ability to sell a mortgage after the bank makes a loan sharply reduces a bank's risk, which encourages banks to make more loans.

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[8] Greenspan, *supra* note [xx], at 8.

[9] *See, e.g.,* Raghuram G. Rajan, *Has Financial Development Made the World Riskier?* (unpublished manuscript, Sept. 2005), available at www.kc.frb.org/PUBLICAT/SYMPOS/2005/pdf/rajan.paper.0804.pdf. We offer a related but somewhat different assessment of the implications of credit derivatives for the banking industry in our Conclusion. *See* Part V, *infra*.

[10] In its own brief description of the history of its role in mortgage back securities, Fannie Mae states that "our credit guaranty business, launched in 1981, helps lenders to package mortgages into mortgage-backed securities, and ensures their credit quality. This enhances the marketability of the securities, allowing lenders to sell the mortgages they originate more easily and replenish their funds to lend." Fannie Mae, *Corporate Fact Sheet*, *available at*

Credit default swaps have had a similar effect on bank lending to businesses. Because swaps limit the bank's downside risk (and pass it on to other parties, such as insurance companies and pension funds), banks are willing to lend much more money to many more businesses. Credit default swaps thus significantly expand companies' access to capital from bank lending.[11]

3. The Benefits of Standardization

A third virtue of credit default swaps, as compared to traditional financial contracts, stems from the newness of the market and the way that it has emerged. If the terms of each credit default swap agreement were negotiated from scratch, credit default swaps could be quite costly. But they aren't. Because the credit default swap market is dominated by a discrete number of banks, and due to the efforts of a trade group– the International Swaps and Derivatives Association, or ISDA– credit default agreements have become standardized.[12] This standardization decreases the transactions costs of credit default swap deals, and provides the other familiar benefits of standardization.[13]

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http://www.fanniemae.com/media/formedia/factsheet.jhtml?p=Media&s=For+the+Media&t=Corporate+Fact+Sheet.

[11] *See generally Risky Business—Credit Derivatives*, ECON., Aug. 20, 2005 (noting that credit derivatives facilitate "the unbundling of financial risks" and have "been healthy for the banking system").

[12] The ISDA website is www.isda.org. The website provides, among other things, a model credit swap agreement, the ISDA Master Agreement. The website also includes a "matrix" of standard provisions in the ISDA Credit Derivatives Physical Settlement Matrix. As discussed further in the next part, ISDA has resisted disclosure of any of the details of actual transactions.

[13] Classic accounts of standardization in the contracts literature include Marcel Kahan & Michael Klausner, *Standardization and Innovation in Corporate Contracting (or "the Economics of Boilerplate")*, 83 VA. L. REV. 713 (1997); Charles J. Goetz & Robert E. Scott, *The Limits of*

At the same time, the active involvement of ISDA, due in no small part to the industry's desire to demonstrate that legislative intervention is unnecessary, suggests that these contracts might not become as ossified and impervious to change as other financial contracts often appear to be.[14]

The industry's response to complaints about the huge backlog of unconfirmed trades, as well as other infrastructure problems in the swaps market, illustrates some of the benefits of this motivated self-regulation. In 2005, Gerald Corrigan of Goldman Sachs, a former president of the New York Federal Reserve, oversaw an industry report that proposed dozens of changes to the handling of credit derivative trades. In response to the report, the leading derivatives firms (affectionately or, to some, ominously known as the "Fourteen Families") agreed, among other things, to notify one another when one party sells its position to someone else, and to clean up the trade confirmation backlog.[15]

Seen in their most favorable light, then, the major players in the credit default swap market have steered between the Scylla of uncoordinated contracting and the Charybdis of excessive standardization. Credit default agreements are quite standardized in many respects, but the market is also subject to intensive, ongoing scrutiny by ISDA and the principal derivatives firms. This ongoing oversight has reduced the costs of

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Expanded Choice: An Analysis of the Interactions Between Express and Implied Contract Terms, 73 CAL. L. REV. 261 (1985).

[14] For theoretical and empirical analysis of the stickiness (and recent change) of boilerplate in sovereign debt contracts, see Stephen J. Choi & G. Mitu Gulati, *Innovation in Boilerplate Contracts: An Empirical Examination of Sovereign Bonds*, 53 EMORY L.J. 929 (2004); Stephen J. Choi & G. Mitu Gulati, *The Evolution of Boilerplate Contracts, in* DEBT RESTRUCTURING AND SOVEREIGN BANKRUPTCY (Jose Ocampo & Joseph Stiglitz, eds. forthcoming 2006).

[15] *See, e.g.,* Wessel, *supra* note [xx].

contracting, and it has further spurred the growth of a market that already is remarkably broad and deep.

4. Market Information about Credit Risk

A final benefit of credit default swaps is their informational value to other market participants. To the extent the pricing of credit default swaps is disclosed or available to the market, it provides an additional source of market-based information about a company's financial health.[16] In recent decades, the most widely followed barometer of corporate (and often, sovereign) stability has been the credit ratings published by rating agencies such as Standard & Poor's and Moody's. Despite their enormous importance to the markets, the ratings are notoriously flawed.[17] Like the yield spreads of corporate bonds, credit default swap pricing may produce better and more timely information about the companies for whom a credit default swap market develops.[18] The price of credit default swap transactions thus can perform a valuable signaling function.

[16] As will become clear in Part III, disclosure is both a virtue and a problem in the current credit swaps market. The information that is available to the markets, such as the current price of a swap, is a valuable signal of creditworthiness. But ISDA and the principal market makers have restricted access to key information about the parties' contracts.

[17] One of us has detailed the shortcomings of rating agency oversight in other work. *See, e.g.,* Frank Partnoy, *How and Why Credit Rating Agencies are Not Like Other Gatekeepers*, *in* Brookings-Tokyo Club Papers on Financial Services (Brookings Institution Press 2006, Barry Bosworth and Robert Litan, eds.) [cited hereafter as *Not Like Other Gatekeepers*]; Frank Partnoy, *The Siskel and Ebert of Financial Markets: Two Thumbs Down for the Credit Rating Agencies*, 77 WASH. U.L.Q. 619 (1999).

[18] For discussion of a proposal that credit spreads be used in the rating process, see Partnoy, *Not Like Other Gatekeepers*, *supra* note [xx], at 51-54 (assessing benefits as well as objections that have been raised).

B. The Benefits of CDOs

As noted in the introduction, CDOs are structured, leveraged transactions backed by one or more classes of fixed income assets.[19] During the mid-1990s, CDOs typically were based on portfolios of high-yield corporate bonds. More recently, CDOs have been based on other assets, including asset backed securities, CDSs, and even other CDOs.[20] In this section, we discuss several of the apparent benefits of CDOs.

1. Using Financial Engineering to Complete Markets

CDOs arguably generate investment opportunities that otherwise would not be available. In this sense, they "complete" the markets for fixed income securities. In a standard cash flow CDO, a financial institution sells debt (loans or bonds) to a Special Purpose Entity (SPE), which then splits the debt into pieces by issuing new securities linked to each piece. Some of the pieces are of higher quality; some are of lower quality. The credit rating agencies give investment-grade ratings to most or all of the tranches,

[19] See Standard & Poor's Structured Finance, *S&P Global Cash Flow and Synthetic CDO Criteria*, Mar. 21, 2002, at 4 [cited hereafter as *Synthetic CDO Criteria*]; *see generally* JANET TAVAKOLI, COLLATERALIZED DEBT OBLIGATIONS & STRUCTURED FINANCE (2003).

[20] Recently, the CDO markets have experienced some difficulties. In April and May 2005, market participants were surprised when equity tranches of CDOs suddenly became much cheaper, while mezzanine tranches became more expensive. Likewise, CDOs obviously performed poorly after the increase in corporate defaults during 2002. In 2003, S&P and Moody's downgraded 150 cashflow CDO transactions, 108 more than in 2001. *See* Anthony Currie, *Cool Heads Rule in CDO Land*, EUROMONEY, Apr. 2003, at 114.

with the exception of the most junior "equity" tranche. Payments to each tranche are governed by stipulated priorities. The use of SPEs to complete markets in the CDO context is similar to the use of SPEs more generally in the context of securitization of financial assets.[21]

As noted above, there are two broad categories of CDOs that are relevant to this discussion: cash flow CDOs and synthetic CDOs. Cash flow CDOs involve the actual purchase of real fixed income assets whose cash flows are used to pay investors in the different tranches. Synthetic CDOs bundle the same kinds of credit risk exposure without real assets, by selling protection on the underlying assets using CDSs.

Because investments in cash flow CDOs often have credit ratings that are higher than the ratings of the underlying bonds, they provide a new opportunity for investors. For example, some investors might not be able to buy the underlying bonds, given their relatively low credit ratings. Other investors might be able to buy the underlying bonds, but would have to pay high capital charges due to regulations that depend on credit ratings. Thus, a cash flow CDO presents a new investment opportunity at potentially lower cost.

One argument about how such arbitrage arises is that real value is created during the CDO process, either because the underlying assets are mispriced initially or because market segmentation otherwise prevents parties from buying the types of portfolios that CDOs create. For example, if regulatory requirements prevent many investors from

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[21] For discussion of the uses of securitization, see, e.g., TAMAR FRANKEL, SECURITIZATION: STRUCTURED FINANCING, FINANCIAL ASSET POOLS, AND ASSET-BACKED SECURITIES (1991 & Supp. 1994); SECURITIZATION OF FINANCIAL ASSETS (Jason H. P. Kravitt ed., 1991) [hereinafter KRAVITT]; STEVEN L. SCHWARCZ, STRUCTURED FINANCE: A GUIDE TO THE PRINCIPLES OF ASSET SECURITIZATION (2d ed. 1993) [hereinafter STRUCTURED FINANCE]; Christopher W. Frost, *Asset Securitization and Corporate Risk Allocation*, 72 TUL. L. REV. 101 (1997).

holding sub-investment grade bonds, one might increase the demand for these bonds by repackaging them in a way that permitted these investors to hold them.

Because synthetic CDOs – in contrast to cash flow CDOs – essentially create new instruments, instead of using assets already on bank balance sheets, they are not motivated by regulatory arbitrage, but instead complete markets by providing new financial instruments at lower prices.[22] Synthetic CDOs are regarded as "pure" arbitrage opportunities, because their tranches typically are priced at higher yields relative to other similarly rated fixed income investments. Indeed, synthetic CDO tranches are popular because they offer investors a less expensive way of participating in the bond market, particularly the market for high yield debt.

2. Taking Advantage of Mathematical Finance

It is worth considering precisely how such CDO arbitrage opportunities have arisen. According to S&P, "rating agencies played an important role in the development of the market since they were able to develop criteria to size default risk based on rates of the underlying obligors."[23] In other words, the rating agencies have developed methodologies for rating CDOs that result in the combination of the tranches being worth more than the cost of the underlying assets. The difference between the price investors in

[22] In other words, the rationale for synthetic CDOs cannot be for a bank to offload its loans for regulatory purposes, because the bank does not actually offload any loans in a Synthetic CDO (the transaction uses credit default swaps instead of loans). *See Synethic CDO Criteria*, *supra* note [xx], 5; *see also* Standard and Poor's Structured Finance Ratings: Criteria for Rating Synthetic CDO Transactions, Sept. 2003 [cited hereafter as *Criteria for Rating*]. In other words, banks must have some rationale for doing synthetic CDOs other than the rationale of reducing the capital charges associated with their loans.

[23] See *Synthetic CDO Criteria*, *supra* note [xx], at 5.

aggregate pay for CDO tranches and the cost of the underlying assets must be substantial, because it covers the high fees the various participants charge for structuring and arranging a CDO, and for managing the underlying assets.

We examined S&P's CDO rating methodology, which is said to generate value by applying principles of mathematical finance to the evaluation of CDO tranches. According to S&P, it uses a proprietary model called CDO Evaluator, which simulates the loss distribution and time to default of the assets in the underlying portfolio using random "Monte Carlo" methods and determines if in any of the simulations a loss trigger is breached. During the late 1990s, both S&P and Moody's developed early versions of such models with the close cooperation of the investment banks that created CDOs. S&P released the first version of CDO Evaluator in November 2001, and has released several updated versions since then.[24]

Once a client has signed an engagement letter, S&P and the client use CDO Evaluator to run simulations to establish the default level of each proposed pool of assets at each rating level. The model uses default estimates based on the existing ratings of the assets. For example, for a tranche to be rated AAA, S&P might require that it be able to withstand a default rate of 30 percent of the asset pool for a particular period of time, assuming a level of defaults based on the ratings of those assets. The default rate for lower credit ratings would be correspondingly higher. The model also incorporates assumptions about how much of the face value might be recovered after a default.

The rating agency and client evaluate the tranches of a CDO using a mathematical algorithm. First, they calculate the expected cash flows of the underlying assets over time. Then they determine how those cash flows would be paid out to each tranche over

[24] More detailed information about CDO Evaluator is available at http://www.standardandpoors.com.

time. The equity, or most junior, tranche absorbs losses up to the first "attachment point." Then the most junior mezzanine tranche absorbs losses up to the next attachment point, and so on. The rating agencies then give a credit rating to each of the tranches (but usually not to the junior tranche) based on assumptions about certain key variables, including expected default rates, recovery rates, and correlation rates among assets.

This process employs sophisticated mathematical techniques. For example, a rating agency might run 100,000 computer simulations to determine the number of times a breach would occur, that is, how often a particular tranche would lose value beyond a specified level. The variable in this assessment is the number of breaches out of the 100,000 runs, not the magnitude of the breach or any qualitative analysis of the breach. For example, for a typical five-year synthetic CDO, S&P might establish a confidence interval for the AAA level of 0.284%, meaning that the particular tranche would be "breached" in 284 runs out of 100,000.

One argument in favor of CDOs is that this mathematical sophistication leads to the production of new, higher value financial instruments. As this argument goes, CDO technology resembles other mathematical insights in finance, such as the Black-Scholes option pricing model, which generated value by enabling investors to price securities more accurately, and by creating new instruments that investors could use for a variety of beneficial purposes.

3. Providing New Diversification Opportunities

Finally, CDOs arguably provide benefits to investors by permitting them to purchase diversified portfolios of fixed income instruments. A CDO is like a firm, in that

a manager is empowered by shareholders to engage in certain activities. In this case, the manager selects a portfolio of bonds. As the argument goes, investors benefit from the manager's expertise, and from the fact that they can pool resources with other investors to obtain a divided ownership interest in a diverse portfolio of bonds.

The diversification value created by a CDO is parceled out among the various participants: the buyers of the highly-rated pieces are paid a higher yield than comparably rated bonds, the banks arranging the CDO receive a fee, and the buyer of the "junior" piece has access to a new kind of investment, which otherwise was not available in the markets: a highly-leveraged position in corporate bonds. Essentially, the "junior" piece borrows money from the "senior" pieces to invest in a diversified portfolio of debt. Although the junior piece is risky and volatile, it also has the potential for high returns.

A synthetic CDO offers further diversification by enabling investors to invest in a diversified portfolio of credit default swaps. Although synthetic CDO fees are high, as the technology becomes more standardized, the costs associated with the structuring process should decline. Thus, synthetic CDOs should begin to resemble indices of credit default swaps, such as the Dow Jones iTraxx, which offers investors a financial instrument based on the performance of a range of credit default swaps.[25] Both of these instruments offer investors a new way of obtaining diversified exposure to fixed income markets.

Interestingly, these two types of credit derivatives – synthetic CDOs and credit default swap-based indices – appear to be converging in some ways. One open question is whether more value is created through the process of securitizing fixed income claims

[25] The International Index Company manages and administers the various iTraxx credit derivative indices. See http://www.itraxx.com.

using synthetic CDOs or the process of creating indexed investments based on credit default swaps.

In terms of more established markets, the synthetic CDO is analogous to a mutual fund, whereas the index of credit default swaps is analogous to an exchange traded fund. In other words, investors in a synthetic CDO, like investors in a mutual fund, pay money for the rights to the cash flows associated with underlying assets. Those assets might be fixed, as in a closed end fund, or variable, as in an actively managed open end fund. In contrast, the credit default swap index is more like a commodity product, such as an ETF or even an index fund, whose value is calculated by reference to some other underlying asset. If this parallel to other markets is correct, the future of the credit default swap index might be more promising than that of the synthetic CDO, primarily because of reduced transaction costs. In other words, just as ETFs and index funds have become more popular because of their low cost, credit derivatives indices might become a preferred way for investors to get exposure to credit derivatives without the relatively high fees associated with individual transactions.

III. THE DARK SIDE OF CREDIT DERIVATIVES

In the previous part, we saw the upside of credit derivatives. This new market offers a world of promise, both for enhancing the liquidity and informational quality of the credit markets generally, and for facilitating governance by banks and other creditors in particular. We turn now to the dark side of credit derivatives. The same innovations

that offer so many remarkable benefits also can undermine the amount or quality of monitoring and oversight, can magnify rather constrain systemic risk and can create other problems as well. This part outlines the perils and limitations of the market for credit derivatives. As in Part II, we begin with credit default swaps, then turn to CDOs.

A. Potential Problems with Credit Default Swaps

1. Reducing the incentives for banks to monitor

In the standard account of banks' role in corporate governance, particularly as the borrower's fortunes deteriorate, banks are the muscular superheroes who step in and take charge to right the troubled ship. They might insist that board members resign or that the company bring in a new chief restructuring officer, and if the company does file for bankruptcy they might use their loan agreement and their ability to meter the company's access to cash to dictate the course of the restructuring process.[26] Banks do often play this role, but the fact that a group of banks has made major loans to a troubled company

[26] Bank governance of small and medium-sized businesses is well-known and is the subject of extensive analysis in the academic literature, often as part of the debate over the efficiency (or not) of secured credit. *See, e.g.,* Robert E. Scott, *A Relational Theory of Secured Credit*, 86 COLUM. 901 (1986) (classic early argument that bank acts somewhat like a joint venturer with a business it finances). Only recently has banks' role in the governance of large corporations become a subject of sustained attention. *See, e.g.,* Douglas G. Baird & Robert K. Rasmussen, *Private Debt and the Missing Lever of Corporate Governance*, U. PA. L. REV. (forthcoming 2006); David A. Skeel, Jr., *Creditors' Ball: The 'New' New Corporate Governance in Chapter 11*, 152 U. PA. L. REV. 917 (2003); George G. Triantis & Ronald J. Daniels, *The Role of Debt in Interactive Corporate Governance*, 83 CAL. L. REV. 1073 (1995).

does not always mean that the banks have an incentive to actively monitor the company.[27]

Enron seems to have been an illustration. JP Morgan Chase, Citigroup, and several other banks lent had billions of dollars to Enron, but they appeared to have provided very little oversight, either while Enron was thought to be healthy or after its fortunes began to deteriorate. There no doubt were many reasons that the banks were missing in action, but surely one of them was credit derivatives. The banks that financed Enron had used massive amounts of credit derivatives to limit their exposure in the event Enron defaulted– by one estimate, they used more than 800 swaps to lay off $8 billion of Enron risk.[28] The banks would have preferred that Enron survive, even after buying all this protection. After all, a healthy Enron meant the ability to keep making loans to Enron and to continue pocketing the fees. But the prospect of Enron's decline meant much less to Enron's banks than if their loans were fully exposed.

The phenomenon is familiar in business life. Bank managers may sleep better at night if they hedge their nine digit exposure to a company like Enron, just as the managers of well-diversified conglomerates slept well in the 1960s. But the protection dulls their incentive to actively monitor. And since banks are often particularly well-positioned to monitor– due, among other things, to their sophistication and the access they have to the details of a debtor's finances– the use of credit default swaps can neutralize a very good monitor. There may be offsetting benefits when a bank hedges its

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[27] Stephen Lubben makes a similar point in an article written shortly after this one. Stephen J. Lubben, *Essay: Credit Derivatives & The Future of Chapter 11*, at 32-33 (unpublished manuscript, 2006).

[28] PARTNOY, INFECTIOUS GREED, *supra* note [xx], at 376.

risk, of course, as we saw in the previous part. But lenders' access to credit default swaps complicates the assumption that a significant bank presence invariably translates to active oversight of the borrower.

In theory, the counterparties to a credit default swap could take up the slack, assuming the banks' monitoring role along with their credit risk exposure. Hedge funds that sell credit derivative protection may emerge, in time, as active monitors of the companies that are the subject of credit derivative contracts.[29] But the pension funds and insurance companies that take on much of the risk are unlikely to provide meaningful monitoring. Unlike banks, they have no relationship with the borrower and are less skilled and experienced in evaluating risk. Overall this suggests that credit default swaps may reduce monitoring oversight, and can lead to moral hazard on the part of borrowers who are subject to less financial discipline from their lenders.

How often do lenders use credit default swaps to lay off their borrower risk, as they did with Enron? Data on the credit default market is too spotty to allow confident conclusions, but Enron does not appear to have been an isolated example. There are active credit default swap markets for many of the largest corporations, and the lenders of these corporations are often among the principal buyers. The breadth of the market became evident when General Motors' credit rating was downgraded in early 2005, which sent shock waves through the credit derivative market because of the huge volume

[29] An interesting question in this regard is whether hedge funds currently require their bank counterparties (i.e., the banks who buy credit insurance protection) to supply them with financial information or other ongoing data about the company in question. We are not aware of arrangements of this sort currently, but such a strategy would suggest that hedge funds may indeed serve as substitute monitors.

of GM credit derivatives.[30] The observations are more suggestive than definitive, but they do suggest that diminished bank monitoring may be a downside consequence of the burgeoning credit derivative market.

2. Incentives to affirmatively destroy value

In 2004, Tower Automotive, which supplies truck frames to the auto industry, borrowed roughly $580 million under a pair of loans arranged by J.P. Morgan Chase and Morgan Stanley.[31] As its financial condition deteriorated, Tower began looking for an additional loan to improve its cash position. The new loan would have required that Tower's existing lenders free up a portion of their collateral and adjust the terms of their interest payments. J.P. Morgan and the banks that had participated in the earlier loan were willing to make the concessions, on the view that the new loan might enable Tower to avert bankruptcy. The hedge fund participants, on the other hand, would have none of it, which meant no concessions under the existing loans and therefore no new loan.[132] Two months later, Tower filed for Chapter 11.

Why the divergence of views between the banks, who favored concessions, and the hedge funds, who chose to play hardball? One can imagine a variety of possibilities,

[30] *See, e.g.,* Eduardo Porter, *Auto Bailout Seems Unlikely*, N.Y. TIMES, April 14, 2006.

[31] The loan and Tower's decline are described in Henny Sender, *Hedge Funds Shake Up Lending Arena*, WALL ST. J., July 18, 2005.

[32] The credit facility apparently required the unanimous consent of the participants as a prerequisite to altering any of its terms. [check].

including differences in institutional culture and the longer term orientation of commercial banks. But one widely rumored explanation is that, in addition to their position as financers of Tower, the hedge funds also had shorted its stock– that is, they borrowed Tower stock and stood to profit if the value of the stock declined. "Some bankers," as the *Wall Street Journal* later reported, "believe hedge funds triggered the filing to make their short positions worth more."[33]

Although the Tower episode involved traditional short selling rather than credit derivatives, it illustrates another potential misuse of the credit default swap market. As with a short position in a company like Tower, a lender that has purchased credit default swaps may have an incentive to use its position as a lender to affirmatively destroy value. A hedge fund or other lender that will benefit more if the company defaults than if it successfully averts default may become, in a sense, a Darth Vader monitor. Such lenders have a financial incentive to actively enforce the terms of their lending agreements. But they profit by forcing the company to default, even if a default will destroy value, not by helping to improve its governance.[34]

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[33] Sender, *supra* note [xx].

[34] The behavior described in this subsection is closely related to recent vote buying techniques employed by hedge funds, a development that achieved notoriety with Perry Corporation's ultimately abandoned 2004 effort to ensure that a proposed acquisition of one pharmaceutical company, King, by another, Mylan, went through. Perry held a significant stake in King's stock. Hoping to tip the Mylan vote in favor of the acquisition, Perry bought Mylan stock and simultaneously shorted the same stock. This gave Perry voting rights in Mylan, despite having no economic stake in Mylan and an incentive to further King's interests at the expense of Mylan and its shareholders. This new form of voting buying is analyzed in Shaun Martin & Frank Partnoy, *Encumbered Shares*, 2005 U. ILL. L. REV. 775 (2005); David Skeel, *Behind the Hedge*, LEG. AFFAIRS, Nov/Dec 2005, at 28, 29-30; Henry T.C. Hu & Bernard Black, *Hedge Funds, Insiders, and Decoupling of Economic and Voting Ownership in Public Companies* (unpublished manuscript, Jan. 6, 2006); Marcel Kahan & Edward B. Rock, *Hedge Funds in Corporate Governance and Corporate Control* (unpublished manuscript, July, 2006) *available at* http://papers.ssrn.com/sol3/papers.cfm? abstract_id=919881.

Because of the secrecy with which hedge funds operate, it is especially difficult to determine how widespread this anti-monitoring behavior is.[35] Any effort to assess the seriousness of the problem is further complicated by hedge funds' ability to provide benign explanations for their recalcitrance, such as the argument that "their stern stance instills financial discipline and doesn't reward unnecessary profligacy."[36] Despite the difficulty of assessing the frequency of anti-monitoring, the point remains: a lender that has purchased a credit derivative may have an incentive to use the leverage afforded by its loan to force a default, even if the default imposes serious costs and impairs the value of the firm.

3. The opacity of the credit default market

The difficulty of determining the pervasiveness of the two concerns discussed thus far points to another dark side of credit default swaps. The market for credit default swaps is quite opaque. Because swaps are structured as Over the Counter (OTC) derivatives, they are largely unregulated. Among other things, this means that the details of particular swaps often go undisclosed. Indeed, ISDA has actively resisted disclosure of credit default swap documentation, insisting that this is proprietary information.

[35] As of February 2006, most hedge funds were required to register with the SEC, but the registration requirement was subsequently struck down by the Court of Appeals for the D.C. Circuit. Goldstein, et al v. Secur's and Exch. Comm'n, No. 04-1434 (D.C. Cir. June 23, 2006). Whether the SEC or Congress will attempt to find a new basis for requiring hedge fund disclosure is unclear as of this writing.

[36] Sender, s*upra* note [xx] (describing hedge fund response).

Thickening the informational fog still further is the frequency with which one of the original parties sells its stake to someone else without notifying the other party. "Record-keeping, documentation and other practices have been so sloppy," as a recent article put it, "that no firm could be sure how much risk it was taking or with whom it had a deal."[37]

This uncertainty can have a variety of undesirable effects. To the extent that investors, the market and other creditors of a company have no way of knowing whether a lender has hedged its position with credit derivatives, they cannot adjust their behavior accordingly. A bank lender's willingness to make concessions means one thing if the bank has a major, exposed lending facility with the debtor; it means something very different if the bank has hedged its risk with credit default swaps. If suppliers, bondholders or other stakeholders do not know whether the bank is hedged, the informational content of the bank's actions will be muddied.[38] This uncertainty is itself an important cost of the credit default swap market. The opacity of the market may also make it more likely that hedge funds or other parties will manipulate default in the ways described in the previous subsection.[39]

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[37] David Wessel, *Wall Street is Cleaning Derivatives Mess*, WALL ST. J, Feb. 16, 2006, at A2. *See also* Greg Ip & Carrick Mollenkamp*, U.S. and Britain Team Up to Test Financial Risk*, WALL ST. J., March 2, 2006, at C1.

[38] For an argument that investors rely on the informational content of the public issuance of debt, see Barry E. Adler, *An Equity-Agency Solution to the Bankruptcy-Priority Puzzle***,** 22 J. LEGAL. STUD. 73 (1993); *see also* Frank H. Easterbrook, *Two Agency-Cost Explanations of Dividends*, 74 AM. ECON. REV. 650 (1984)(signaling value of dividends). As discussed in the text, the opacity of the credit default market interferes with the information content of bank oversight or lack thereof.

[39] The lack of transparency, together with the dearth of regulation, may also invite other forms of misbehavior, such as insider trading in credit default swaps. For evidence suggesting the possibility of insider trading, see, e.g., Kara Scannell et al, *Can Anyone Police the Swaps*, WALL ST. J., Aug. 31, 2006, at C1 (describing upward spikes in price prior to acquisitions).

As noted earlier, some derivatives industry participants recently have tried to address some of the infrastructure problems in the credit default swaps market. But even after the industry's intervention, two problems remain. First, to the extent investors and the markets still have little information about the credit default activities of particular parties, the informational content of a bank's or other lenders interactions with the debtor will remain unclear. The second concern is a downside of industry self-regulation, and warrants a brief, separate discussion.

4. The downside of self regulation: industry self protection

Although industry self regulation has a great deal to recommend it, it has important downsides.[40] Most stem from the fact that the industry's regulatory efforts will inevitably further the self interest of the major industry players. To the extent that industry self interest and social welfare are aligned, the role of industry players is unproblematic. The rapid standardization of credit default swaps may benefit existing market makers by increasing the volume of their credit default swaps practice, for instance, but the reduction in transaction costs also benefits other parties.

But the leading firms also may attempt to protect their own interests even when this undermines the efficiency of the market as a whole. In particular, there are concerns that ISDA, the derivatives industry trade group, will develop standardized documentation and approaches that benefit ISDA members at the expense of others, either because they

[40] The benefits and limitations of industry self regulation are discussed in detail in the corporate takeover context in John Armour & David A. Skeel, Jr., *Who Writes the Rules for Hostile Takeovers, and Why? The Peculiar Divergence of US and UK Takeover Regulation* (unpublished manuscript, 2006)(contrasting self regulation in UK to court- and rule-based US approach).

redistribute resources among parties, create or take advantage of informational asymmetries, or create negative externalities.[41] Similarly, the major market makers may have a disincentive to promote broad disclosure, since this would diminish the value of their specialized knowledge of the credit default swaps market.

The Second Circuit's 2001 decision in *Caiola v. Citibank* illustrates some of the concerns about standardized derivatives documentation.[42] In 1994, Citibank proposed to a long-time client, Louis Caiola, an investment strategy involving "synthetic" trading of stocks and options. Instead of actually buying particular stocks and options, Caiola entered into an ISDA Master Agreement with Citibank, which agreed to pay Caiola the economic returns of those instruments in exchange for an agreed periodic payment. Caiola and Citibank also executed a confirmation for each synthetic transaction. Caiola's trading was substantial, and in 1998 his synthetic trades equaled 25 percent of the total worldwide volume in Philip Morris stock options.

Initially, Citibank hedged its risks by trading stocks, but it later switched to hedging with options. A few months later, Citibank refused to allow Caiola to continue trading in Philip Morris options. Caiola alleged that he lost money when Citibank switched to options hedging, and that he was unable to hedge his own losses (tens of millions of dollars) when Citibank terminated his trading.

The Caiola case presented an issue of first impression concerning whether the parties, by labeling a transaction a "synthetic stock trade" could opt out of the coverage of the securities laws. The district court relied extensively on the parties' representations in the ISDA documents and confirmations for the transactions. In those confirmations,

[41] See Frank Partnoy, *ISDA, NASD, CFMA, and SDNY: The Four Horsemen of Derivatives Regulation*, Brookings-Wharton Papers on Financial Services 213 (Robert E. Litan and Richard Herring, eds. 2002).
[42] Caiola v. Citibank, N.A., 25 F.3d 312 (2d Cir. 2002).

Caiola acknowledged that he was not relying on any advice from Citibank, that he had the independent ability to evaluate the transaction and its risks, that Citibank was not his fiduciary, and that the transaction would not be registered under the securities laws. Based on these representations, the district court ruled that the synthetic transactions were not securities and that Citibank had not violated the securities laws.

The Second Circuit reversed this ruling on appeal. The appellate court focused on the question of whether the signed disclaimers specifically related to the risks at issue. It found that the disclaimers were too generic. In other words, the court found that because of the information and sophistication asymmetry between the parties, the party with the negotiating advantage was required to disclaim risks more specifically.

It is unclear how far *Caiola* will extend. Just as the common law of contract has evolved to include exceptions to the general rule that courts will enforce the clear intentions of the parties (e.g., implied contractual terms, fiduciary duties, unconscionability), judges interpreting ISDA provisions might make similar exceptions. However, most industry participants doubt that judges will do much to police financial services industry self regulation, and cases involving OTC derivatives suits are rare.[43]

Although standard form derivatives documentation clearly can be cost reducing, and theoretically could evolve to provide more appropriate terms, ISDA's virtual monopoly on the creation of legal rules might be problematic. If a few major dealers control ISDA documents, those agreements might be written either with dealer-to-dealer contracts in mind (and therefore might not be appropriate for contracts between a dealer

[43] Of particular significance in such cases would be evidence of any substantial information or sophistication gap between the parties, especially if such a gap generated a degree of trust in the relationship between the parties. There is an extensive body of law that refuses to treat contracts of adhesion or standard form contracts like other negotiated contracts. See John D. Calamari & Joseph M. Perillo, The Law of Contracts 382-92 (4th ed. 1998).

and an end-user such as Caola), or might be constructed to advantage dealers in dealer-to-end-user contracts.

The leadership of ISDA does appear to be dominated by a small number of major dealers. In contrast, end-users of derivatives are much more numerous and diffuse, and therefore face collective action problems in creating a plausible set of alternative legal rules. Moreover, end-users are not entitled to vote on ISDA decisions, and do not have any substantial role in formulating legal rules.

Nevertheless, even given ISDA's domination, individual dealers have incentives to compete for derivatives business, and if end-users value particular contract provisions, individual dealers can capture business by amending their forms. Derivatives markets are large and transactions costs are relatively low, so that even if the legal rules were fixed and non-negotiable, dealers and end-users still could negotiate based on price. Anecdotal evidence suggests that the key provisions of derivatives contracts are rarely negotiated, and that the types of representations appearing in the Caiola-Citibank contract pervade ISDA documents regardless of the relative sophistication and bargaining power of the parties. If representation-related contract terms are not priced, a monopoly in ex ante specification of legal rules could generate rents for the dealers who create those rules. Moreover, terms appropriate for dealer-to-dealer transactions might not be appropriate for dealer-to-end-user transactions.

In the context of credit derivatives, counterparties also might use ambiguous terms to their advantage. For example, what is the meaning of the term "restructuring"? If payment on a credit derivatives contract is to be made upon an event of "restructuring," a sophisticated counterparty might argue that the event had been triggered with respect to

payments counterparties owed to it, but not with respect to payments it owed to counterparties.[44]

5. Systemic Risk in the Credit Default Swaps Market

Credit default swaps also raise systemic concerns. Because many investors– particularly hedge funds- place highly leveraged bets on credit default swaps– even a relatively small market change could trigger a crisis of the sort that Long Term Capital Management threatened to unleash when it collapsed in 1998.[45] The rush to unwind a vast array of interconnected contracts could create serious liquidity problems in the financial markets. Given the size of the market– the ten largest U.S. banks alone have $600 billion at stake– a crisis involving credit derivatives would cause convulsions throughout the international financial markets. Thus, while credit default swaps can diminish systemic risk, as we saw in the last part, the market also has the potential to cause precisely the opposite effect.

B. The Downsides of CDO's

Although CDOs appear to create value for investors, they also present potential problems. Many of the problems of CDOs are similar to those of credit default swaps. To the extent CDO special purpose entities, rather than banks, hold bonds and loans, there are further reductions in the incentives of banks to play their traditional monitoring

[44] See, e.g., Argentina cases.
[45] The LTCM debacle is chronicled in Partnoy, Infectious Greed, at 251-62.

function.[46] Moreover, hedge funds and other sophisticated investors have incentives to manipulate the pricing and structuring of CDOs, and some studies suggest that CDO managers manipulate collateral in order to shift risks among the various tranches.[47] CDOs also are an opaque market that is dominated by a handful of interests. And CDOs pose systemic risks, including the risk that a default on one or more bonds would generate a ripple effect of defaults in CDOs.[48]

Rather than repeat the above arguments with respect to CDOs, we simply note that they apply with equal or greater force, and instead focus on a potential problem that is unique to CDOs: the costly mispricing of credit. The transaction costs associated with CDOs are very high, and there is reason to believe that the potential benefits of CDOs, described in Section II, are not real.[49]

At the outset, we note the apparent value created by CDOs is in some tension with basic economic theory. The Law of One Price suggests that similar assets should have similar values.[50] If they did not, someone would buy low, sell high, and earn a riskless profit. If a bank can make money repackaging corporate debt through a CDO, it must mean there are inefficiencies in the corporate debt market. But if some of the debt in the

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[46] These effects can be counteracted to some extent by requiring a bank—such as the investment bank that creates the CDO—to hold a stake in the junior tranche. But this still is likely to lead to substantially less monitoring than under a traditional bank loan.

[47] See Kendran Garrison, Manager Incentives in Collateralized Debt Obligations, Aug. 15, 2005, at 6, available at SSRN, http://ssrn.com/abstract=720481.

[48] Such an event nearly occurred when WorldCom defaulted on its obligations; a majority of CDOs contained WorldCom bonds at the time, and WorldCom bonds made up an average of 1.2 percent of synthetic CDOs. See Infectious Greed.

[49] This discussion is drawn from Partnoy, *Not Like Other Gatekeepers*, *supra* note [xx].

[50] For discussion of the Law of One Price, see, e.g., FRANKLIN ALLEN, RICHARD A. BREALEY, & STEWART C. MYERS, PRINCIPLES OF CORPORATE FINANCE (8th ed. 2006).

portfolio is mispriced, market participants should take advantage of this mispricing directly, by buying and selling bonds – and earning arbitrage profits – until prices are accurate.

Moreover, there aren't the same restrictions on selling short bonds or credit default swaps that there have been for stocks. Regulatory arbitrage might explain some of the activity in cash flow CDOs, where parties take advantage of the reduction in net capital requirements from holding highly-rate CDO tranches instead of the underlying bonds. But regulatory arbitrage cannot explain the growth of synthetic CDOs, because the underlying credit default swaps do not have the same regulatory costs as actual bonds.[51]

Investors who want to own diversified portfolios of fixed income assets are not prohibited from doing so. Moreover, if markets were segmented by risk, one would expect market pressure to lead corporations that issue bonds to create capital structures that would be most attractive to particular market segments. Corporate bonds are not like home mortgages, which typically cannot be purchased individually or even in diversified classes. Economists know that arbitrage opportunities rarely persist unless there is a dominant information asymmetry or regulatory explanation. The purchasers of CDO tranches typically are sophisticated and the regulatory rationales do not apply to synthetic CDOs. Moreover, the cost of this so-called "arbitrage" is enormous: if a trillion dollars of CDOs have been sold, financial intermediaries have earned billions of dollars in fees.

It seems likely that because the methodologies used for rating CDOs are complex, arbitrary, and opaque, they create opportunities for parties to create a ratings "arbitrage"

[51] As noted earlier, *see supra* note [xx], synthetic CDO's are not subject to the capital rules that influence bank investment decisions with respect to actual bonds.

opportunity without adding any actual value. It is difficult to test this view, although there are reasons to find it persuasive. Essentially, the argument is that once the rating agencies fix a given set of formulas and variables for rating CDOs, financial market participants will be able to find a set of fixed income assets that, when run through the relevant models, generate a CDO whose tranches are more valuable than the underlying assets. Such a result might be due to errors in rating the assets themselves (i.e., the assets are cheap relative to their ratings), errors in calculating the relationship between those assets and the tranche payouts (i.e., the correlation and expected payout of the assets appear to be higher and therefore support higher ratings of tranches), or errors in rating the individual CDO tranches (i.e., the tranches receive a higher rating than they deserve, given the ratings of the underlying assets).[52]

Although the mathematic techniques of CDO technology are sophisticated, they are subject to the limitations of "garbage in, garbage out." For example, S&P calculates a probability distribution of default rates for a portfolio, and then calculates a set of Scenario Default Rates (SDRs) in two steps.[53] First, for a given tranche to receive a particular rating, the probability of defaults in its portfolio exceeding the portfolio default rate cannot exceed the default rate for a corporate bond with that rating. Second, S&P multiplies the portfolio default rate by an adjustment factor depending on the tranche.

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[52] The rating agencies are sensitive to these arguments. As S&P has described the CDO process, "This is not alchemy or turning straw into gold, but rather the implementation of structured finance to create different investment risk profiles, based on the structuring of credit support." *See Synthetic CDO Criteria*, *supra* note [xx], at 14.

[53] Standard & Poor's, CDO Evaluator Applies to Correlation and Monte Carlo Simulation to Determine Portfolio Quality, Nov. 13, 2001.

This is basically an error factor that in S&P's judgment should adjust for the fact that actual defaults might be higher or lower.

Recovery rates and recovery timing for assets vary depending on the nature of the asset, particularly its seniority. This is far from an exact science – recovery times vary by jurisdiction, legal framework, and debtor's rights – and there rarely is historical evidence of default rates for particular assets (especially rated assets). Yet the assumed recovery inputs the rating agencies use necessarily must be precise ones.

The default probability estimates S&P uses are fixed, based on default probability estimates within a given rating category. S&P has published assumptions about default rates to be used in certain CDO calculations, as set forth in the chart below.[54]

S&P Default Rate Assumptions for CDOs

	ABS (all)	Corp Year 4	Corp Year 7	Corp Year 10
AAA	0.25%	0.19%	0.52%	0.99%
AA	0.50%	0.57%	1.20%	1.99%
A	1.00%	0.81%	1.81%	3.04%
BBB	2.00%	1.81%	3.94%	6.08%
BB	8.00%	9.49%	14.20%	17.47%
B	16.00%	21.45%	26.15%	28.45%

[54] *Id.*

If a CDO manager is able to purchase assets within a particular rating category at market prices that implied a higher default rate than the one suggested in the above table, the manager could create an "arbitrage" profit by achieving a higher rating.[55] To the extent purchasers of CDO tranches care primarily about ratings and yields, rather than the analysis of the actual default probability of the assets, the CDO would add value. It is important to note that the agencies rate bonds within a particular rating category, say AAA, even though market prices imply different probabilities of default. They permit CDO managers to assume that the rating agencies' assumptions, not the market's implicit assumptions, are the relevant ones when evaluating the tranches of CDOs. Put another way, credit rating agencies are providing the markets with an opportunity to arbitrage the credit rating agencies' mistakes (or, more generously, the fact that rating categories cover a broad range of default probabilities, rather than a point estimate).

The problems with how CDO pricing models incorporate various measures of correlation among assets are even more troubling. Clearly, the ratings of CDO tranches should be sensitive to the correlation of the underlying assets. Yet even as late as 2002, S&P's correlation inputs for corporate assets were simply 0.3 within a given industry and 0.0 between industry sectors. The correlation inputs for asset backed securities were similar. S&P recognized that these inputs were flawed, but used them nonetheless.[56] The

[55] For example, if S&P assumes, as the above chart suggests, that the default rate on BBB-rated bonds for four years generally is 1.81%, one could generate an arbitrage profit by finding BBB-rated bonds whose market prices implied a much higher default probability (i.e., BBB-rated bonds that were cheap), and then taking advantage of the fact that the CDO tranches based on those bonds would be rated on the assumption that the default rate was 1.81%. A resulting CDO tranch might be rated AAA, based on S&P's assumptions, and therefore be a cheap AAA investment relative to other AAA-rated instruments that were priced based on the market's perception of actual default probabilities.

[56] *See Synthetic CDO Criteria*, *supra* note [xx],, at 46 ("As data becomes available, the correlation coefficients will be modified based on documented studies.").

Bank for International Settlements also has expressed concerns about this kind of model risk, particularly with respect to correlation.[57]

Perhaps surprisingly, it is the investment bank structuring the CDO, not the rating agency, that typically performs these complex calculations.[58] The process of rating CDOs becomes a mathematical game that smart bankers know they can win. A person who understands the details of the model can tweak the inputs, assumptions, and underlying assets to produce a CDO that appears to add value, even though in reality it does not.

The mathematical precision of the models is illusory, because numerous subjective factors enter the process as well. For example, the rating agency evaluates the CDO asset manager, who has discretion to engage in trading. CDOs typically are not fully funded when they are first rated; instead, the manager has a set of parameters governing which assets it is permitted to buy or sell. There also are difficult questions about the documentation of CDOs, as well as record and reporting requirements, which are not yet standardized.[59]

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[57] *See* Bank for International Settlements, *The Role of Ratings in Structured Finance*, Jan. 2005. Some credit rating agency officials have echoed those concerns. See BIS Vindicates Agencies, But Warns on Ratings Limitations, Correlation Risk, Structured Finance International, Jan. 1, 2005, at 56 (quoting the head of CDOs at S&P in London as saying, "I'm not sure correlation risk has been fully understood by anyone. We try to be very clear to the market about what our assumptions are and how our models work.").

[58] For example, S&P states that "[t]he transaction's sponsor or banker will generally perform the cash flow modeling and provide Standard & Poor's with the results and the model. The sponsor or the banker doing the cash flow modeling must also provide to Standard & Poor's an independent-accountant verification that the proprietary cash flow model is representative of the transaction structure, and that the dominant cash flow run results are as indicated by the party doing the modeling." *See Synthetic CDO Criteria*, *supra* note [xx], at 17-18.

[59] Additional complications arise as to what are known as leveraged super senior notes, essentially tranches above the AAA-rated notes that take the last loss in a CDO transaction.

Even if these difficulties could be surmounted, consider the complexities associated with so-called "CDO Squared" transactions, whose assets consist of a reference portfolio of other CDOs and asset-backed securities (or, less commonly, "CDO Cubed" transactions, whose assets consist of a portfolio of CDO Squareds).[60] Again, the models require assumptions about all of the variables stated above, but this time piled on to a second (or third) level, with respect to the underlying CDOs, in addition to the underlying assets of those CDOs. Moreover, although a typical CDO Squared transaction might involve 1,000 corporate names,[61] there are only about 400 issuers of liquid corporate bonds. That means certain names must appear more than once. According to S&P, each corporate name appears in such transactions, on average, 4.17 times.[62]

Given these complexities, why do parties purchase CDO tranches? If the problem is that bonds are mispriced, one would expect the credit default swap market to resolve that problem, or at minimum provide lower cost opportunities to arbitrage that mispricing than high-fee CDOs. If the problem is that bond purchasers and issuers are in different market segments, one would expect issuers to take advantage of potential arbitrage opportunities by adjusting their capital structure and/or leverage to attract neglected segments of the market. Yet there is little evidence CDOs are used to create new assets

[60] The ostensible benefit of a "CDO Squared" or "CDO Cubed" transaction is that they create highly rated tranches of securities with yields that are more attractive than comparably-rated investments. It is unclear whether the purchasers of these securities understand the source of these above-market yields.

[61] Standard & Poor's, Drill-*Down Approach for Synthetic CDO Squared Transactions*, Dec. 10, 2003.

[62] *Id*.

with underrepresented credit ratings; instead, the ratings of CDO tranches span the same range as those of corporate bonds.

If the mathematical models have serious limitations,[63] how could they support a multi-trillion-dollar market? Some experts have suggested that CDO structurers manipulate models and the underlying portfolio in order to generate the most attractive ratings profile for a CDO. For example, parties included the bonds of General Motors and Ford in CDOs before they were downgraded because they were cheap relative to their (then high) ratings.[64] The primary reason the downgrades of those companies had an unexpectedly large market impact was that they were held by so many CDOs.[65]

In sum, CDOs present not only the numerous risks associated with credit default swaps, but also the risk that parties are spending billions of dollars in fees to buy mispriced debt. The potential market inefficiencies are substantial, given the size of the

[63] Recent research in finance shows that asset pricing models of the variety used by credit rating agencies fail to explain real world data. See Nikola A. Tarashev, *An Empirical Evaluation of Structural Credit Spread Models*, BIS Working Papers No. 179 (July 2005). For example, observed market spreads typically are much higher than those predicted by structural models, especially at the high quality end of the rating spectrum. See Til Shuermann, A Review of Recent Books on Credit Risk, Federal Reserve Bank of New York (Sept. 2004) (citing numerous studies). These studies suggest that there are significant non-credit components to spreads on fixed-income instruments. Moreover, such models fail to take into account tail risk, and are based on historical measures, which often are not good predictors. One would think that the collapses of firms such as Long-Term Capital Management and Askin Capital Management would have been sufficient warning to entities attempting to engage in arbitrage based on such models. See also Mark Whitehouse, How a Formula Ignited Market that Burned Some Big Investors, Wall St. J., Sept. 12, 2005, at A1.

[64] Likewise, more than three-fourths of the pre-2002 CDOs S&P rated in the United States contained WorldCom bonds, representing an average of more than one percent of the assets of synthetic CDOs. See Jenny Wiggins, *Growth of Structured Finance Sector Set to Slow*, FIN. TIMES, July 1, 2002, at 26. Representatives of Moody's have stated that 58 of the synthetic CDOs it rated had exposure to WorldCom. *See* Rebecca Bream, *Moody's Expects Pressure on CDOs*, FIN. TIMES, July 10, 2002, p. 31.

[65] See Henny Sender, Carrick Mollenkamp & Michael Mackenzie, WALL ST. J., May 11, 2005 (quoting Janet Tavakoli, a prominent structured finance expert, as suggesting that "managers often game the portfolio").

CDO market and the magnitude of CDO fees. There are only two possibilities: either CDOs are being used to arbitrage a substantial price discrepancy in the fixed income markets or CDOs are being used to convert existing fixed income instruments that are priced accurately into new fixed income instruments that are overvalued. The first possibility assumes the existence of a substantial market inefficiency, perhaps the most substantial inefficiency ever found in the finance literature. The second possibility seems more likely. In other words, CDOs either CDOs are evidence of a substantial and pervasive market imperfection, or they are being used to create one. In the next section, we examine potential reforms, including suggestions for reducing the market distortions associated with CDOs.

IV. IMPLICATIONS FOR MARKET ADJUSTMENT OR REGULATORY REFORM

In this section, we sketch some preliminary ideas regarding reforms that might resolve some of the costs and risks associated with credit derivatives. We focus on three primary areas of reform: disclosure, credit ratings, and nondebtor termination rights in bankruptcy.

A. Disclosure

We believe disclosure with respect to both credit default swaps and CDOs should improve, although we are agnostic as to whether improved disclosure requires government intervention. In general, credit derivatives have been largely unregulated, and fall within the statutory exemptions from securities law that apply to over-the-counter derivatives generally.[66] Although we believe there are strong policy arguments that credit derivatives should be subject to the same substantive regulation as other economically equivalent instruments, such as bonds and loans, we recognize that such changes are unlikely as a political matter. Nevertheless, as a quid pro quo for the continuing unregulated status of credit derivatives, we believe it is reasonable to request that private parties should make additional voluntary disclosures. Specifically, we believe public disclosures should include the following.

First, ISDA should make all credit derivatives documentation available for free on the Internet. ISDA currently has a monopoly on credit derivatives documentation, and market participants must pay fees for documents. ISDA suggests that it has copyrights to these documents and that it will enforce its intellectual property rights. It should abandon those positions and practices.

Second, market participants should be required to register credit derivatives transactions by publishing the documentation for their transactions through a service such as the SEC's Edgar service. As a preliminary matter, it would be helpful if even a few market participants would publish documentation for their transactions with an online

[66] For discussion of over-the-counter derivatives and their regulatory treatment, see, e.g., Karen P. Ramdhanie, *Derivatives Contracts of Insolvent Companies: Preferred Treatment Under the Bankruptcy Code of the United States and the Insolvency Laws of the United Kingdom*, 18 N.Y.L. SCH. J. INT'L & COMP. L. 269, 272 n.28 (1999).

service such as Findlaw, which currently publishes sample transaction documents in other areas (e.g., stock purchase agreements).

Third, although there is some price transparency in certain segments of the credit default swap market, we believe there should be a centralized pricing service for credit derivatives generally. The broker services that deal in credit default swaps could easily make historical prices available to the public. Moreover, Moody's and S&P publish data regarding CDOs on their websites.[67]

Fourth, companies that already are reporting companies should be required to include descriptions of the effects of credit derivatives, not only in footnote disclosure, but in narrative form in the management's discussion and analysis of results and operations sections of their financial filings. Specifically, companies should be required to disclose the effect of credit derivatives transactions on their risk exposure. For example, a bank might disclose the nature of its lending exposure based on its use of credit default swaps to hedge. To the extent companies are not disclosing this information, the SEC might require it through rulemaking.

B. Credit Ratings

One of us has written extensively about potential reforms in the credit rating industry.[68] We will not rehash those writings here, except to note that, with respect to credit derivatives, we believe opening credit ratings to competition should resolve some of the problems. Specifically, an approach such as that embodied in H.R. 2990, the

[67] See http://www.moodys.com; http://www.standardandpoors.com.
[68] *See, e.g.,* Partnoy, *Not Like Other Gatekeepers, supra* note [xx].

Credit Rating Agency Duopoly Relief Act of 2005, would increase competition by eliminating the SEC's role in recognizing approved credit rating agencies, and substituting a registration requirement.[69]

In addition, we believe companies should be required to explain their investment policy with respect to credit ratings. Both S&P and Moody's state explicitly that ratings are not recommendations to buy and should not be the basis of investment decisions. We believe institutional investors, particularly fiduciaries, should describe the extent to which they rely on credit ratings in making investment decisions or for other purposes. In making the additional disclosures described above, institutional investors also should describe the extent to which credit ratings are relevant to their decision to use credit default swaps or CDOs. They should describe whether their internal assessment of the credit quality and risks of CDO tranches they buy are consistent with the public credit ratings of those instruments.

C. Automatic Stay and Termination Rights in Bankruptcy

The non-debtor counterparty to a derivative or related financial instrument enjoys extraordinary privileges if its counterparty files for bankruptcy. Absent special protection, the derivative would be subject to bankruptcy's automatic stay, which prohibits nondebtors from taking any action to enforce an obligation against the debtor

[69] See H.R. 2990 (substituting a system of Nationally Registered Statistical Rating Organizations for the current SEC recognition requirement).

without court approval.[70] Bankruptcy also prevents most nondebtors from invoking ipso facto clauses—provisions that make bankruptcy a condition of default under the parties' contract.[71] Derivatives are given special treatment in both of these areas.[72] Unlike other nondebtors, the nondebtor participants in derivatives contracts are permitted to enforce their rights without interference from the bankruptcy process, due to a perception that if enforcement were delayed, the collapse of an important player in the derivatives markets could have a contagion effect throughout the financial markets.[73] The 2005 amendments to the Bankruptcy Code extended the special treatment by, among other things, expanding the range of financial instruments that qualify.[74] The question for our purposes is whether the special treatment is justified.

The first thing to note is that the standard explanation for the special treatment is not particularly compelling. It is far from clear that the exception reduces systemic risk;

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[70] The derivative would qualify as property of the estate under 11 U.S.C. sec. 541(a), and section 362(a) imposes a stay on any effort to exert control over property of the estate. 11 U.S.C. sec. 362(a).

[71] *See* 11 U.S.C. sec. 541(c)(1); *id.* sec. 365(e).

[72] 11 U.S.C. sec. 362(b)(6)&(7)(permitting setoff and closing out of derivatives contracts); *id.* 555 (excepting "securities contracts" from prohibition against enforcement of ipso facto clauses); 556 (excepting forward and commodities contracts); 559 (repos); 560 (swaps); 561 (master netting agreements).

[73] *See, e.g.,* H.R. REP. NO. 97-420, at 2 (1982)(exception needed to prevent the "insolvency of one commodity firm from spreading to other brokers or clearing agencies and possibly threatening the collapse of the market").

[74] Among other things, the amendments expanded the definition of "swap" to include both parties to nearly every conceivable derivatives contract. The amendments also explicitly added credit derivatives to the definition. 11 U.S.C. sec. 101(53B). For overviews of the 2005 amendments, see, e.g., Shmuel Vasser, *Derivatives in Bankruptcy*, 60 BUS. L. 1507 (2005); Edward R. Morrison & Joerg Riegel, *Financial Contracts and the New Bankruptcy Code: Insulating Markets from Bankrupt Debtors and Bankruptcy Judges* (unpublished manuscript, Jan. 25, 2006), *available at* http://ssrn.com/abstract=878328.

it may even increase this risk, since it eliminates a possible curb on counterparties' rush to close out their contracts in the event of a wave of failures.[75]

A more persuasive rationale is that it is unnecessary to impose the automatic stay on, and delay enforcement of, derivatives contracts. The stay, as traditionally conceived, enables the debtor to keep assets together in order to preserve their going concern value for a reorganization or sale. Because derivatives are fungible financial instruments--more like cash than essential equipment or property—there is no need to prevent a counter party from exercising its rights. "No harm, no foul," the reasoning goes.[76]

While this reasoning is much more compelling than the standard justification for special treatment, there are important countervailing considerations with respect to at least some derivatives—particularly credit default swaps. For a company whose major clients are auto manufacturers and which has purchased a credit default swap protecting it against a downgrade of one or more of the manufacturers, for instance, the swap is quite similar to an insurance policy.[77] Insurers are generally prevented from terminating an insurance policy when a company files for bankruptcy, and it is not obvious that credit derivatives that serve a similar function should be treated differently.[78] Especially is this

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[75] This problem with the traditional explanation is discussed in detail in Franklin R. Edwards & Edward R. Morrison, *Derivatives and the Bankruptcy Code: Why the Special Treatment?*, 22 YALE J. REG. 101, 107-109 (2005).

[76] Each of these points is made in Edwards & Morrison, *supra* note [xx].

[77] Similar to, but not identical. Unlike with a standard insurance policy, for instance, the protection seller under a credit default swap does not fully step into the shoes of the protection buyer. If the buyer is a bank that has lent money to the debtor, the bank continues to retain its rights under the loan itself. For a more detailed discussion of the differences between a credit default swap and a standard insurance policy, see Lubben, *supra* note [27], at 28-33.

[78] The courts that prohibit an insurer from terminating treat the policy as property of the estate and hold that termination would therefore violate the automatic stay. *See, e.g. In re Cahoki Downs, Inc.*, 5 Bankr. 529 (Bankr. S.D. Ill. 1980).

so given the incentive a counterparty may have to terminate a credit derivative strategically. If bankruptcy is a basis for termination of a credit derivative and the value of the derivative has increased (because the likelihood of issuer default or downgrade has increased), the counterparty may terminate, making it much more expensive for the debtor to enter a new hedging contract.

The risk of strategic termination suggests that there are real costs to simply leaving the parties to derivatives to their own devices. At the least, we believe that counterparties to credit derivatives should not be permitted to invoke ipso facto clauses.[79] More generally, our analysis suggests that the blanket exception for derivatives should be rethought. Although a more fine-grained approach that applied the automatic stay to some derivatives, such as those designed for insurance purposes, would complicate the treatment of derivatives in bankruptcy, we believe that a more nuanced approach is preferable to adopting a blanket rule that invites strategic termination by nondebtors.[80] The costs of excluding every derivative from the ordinary protections of bankruptcy are likely to rise, moreover, as companies increasingly turn to derivatives as a substitute for traditional forms of insurance.

V. CONCLUSIONS

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[79] For a similar concern about special treatment in bankruptcy, see Vasser, *supra* note [xx], at 154 (noting that "only the non-debtor counterparty obtains the upside of a derivative in a bankruptcy, not the debtor").

[80] We part ways here with the conclusions of an excellent new article by Ed Morrison and Joerg Riegel. Morrison and Riegel defend the Code's blanket approach as preferable to attempting to more carefully distinguish between derivatives for which the stay may be necessary, and those for which it is not. Morrison & Riegel, *supra* note [xx], at 28-29.

Sweeping new regulatory intervention in the credit derivatives market does not seem either likely or desirable. While we are less sanguine than Alan Greenspan that the market can be expected to regulate itself, regulators would do better by tweaking the market in some of the ways we have just discussed, than by attempting to intervene in more aggressive fashion.

In our view, the future of credit derivatives lies in the innovative use of these new contracts by the parties themselves. Now that it is possible to carefully calibrate risk exposure, for instance, there may be room for non-bank financial institutions to narrowly specialize on the monitoring and credit risk assessment roles that traditionally have played by banks. Such an institution—most likely a hedge fund or debt-focused analogue to a private equity fund—could hedge the interest rate risk associated with its lending operations and focus exclusively on monitoring the borrower's default risk. These institutions could compete on the turf that has traditionally been occupied by banks by separating two of bank's principal functions, bearing interest rate and borrower default risks, and focusing on the latter. In effect, such a strategy might anticipate the direction in which many major banks are evolving, and get there first.

It is, of course, impossible to predict just how the credit derivatives market will develop, and what new innovations it will spawn. But credit derivatives already are transforming the landscape of corporate governance. Our hope is that this article will be the first of many efforts by legal scholars to integrate this new market into our understanding of corporate governance.