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# The Empty Creditor Hypothesis

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**Executive summary**

This Research Note provides a preliminary analysis of the issues raised by the "empty creditor" hypothesis that creditors who hedge their exposures will be indifferent to a firm's survival. It will explain the empty creditor hypothesis, and why it might be of concern. The note then formulates some explicit implications of the hypothesis and examines the arguments and evidence in support of the implications. As will be seen, there are reasons to question the plausibility of the empty creditor hypothesis on logical grounds. Further, the evidence available thus far, in the form of restructuring choices by distressed firms as well as in market practices surrounding credit derivatives, does not appear favorable to the empty creditor hypothesis.

## Introduction

Hedging involves the transfer of an unwanted risk to another party in return either for a payment or for taking on a preferred risk. Although hedging has the benefit of reducing exposure to a particular risk, it comes at the cost of giving up the opportunity to benefit from the exposure. In the case of credit, creditors can hedge credit risk by means of credit default swaps and certain other instruments. Hedging credit means that the protection buyer gives up exposure to default by the reference entity, but it also means that the protection buyer gives up the opportunity to profit from exposure to the reference entity's credit. As a general matter, the ability to hedge credit risk, and the resulting facilitation of credit risk diversification, has been welcomed as a useful and beneficial innovation that enhances the safety and soundness of the financial system (Greenspan 2004, Berner 2007).

Professors Henry Hu and Bernard Black, however, have advanced a hypothesis regarding the effect of hedging credit risk on the behavior of creditors of distressed institutions (Hu and Black 2008a, 2008b). Although Hu and Black acknowledge that the evidence in support of the hypothesis is slim, the hypothesis has attracted wide attention, especially in the press. Investor George Soros, for example, linked the AbitibiBowater and General Motors bankruptcies to the fact that "some bondholders owned CDS and stood to gain more by bankruptcy than by reorganization" (Soros 2009). In addition, the *Economist* has argued that the availability of credit default swaps has undermined the premise "that creditors always attempt to keep solvent firms out of bankruptcy."

Instead, “lenders who hedged their economic exposure through credit default swaps… can often make higher returns than from out-of-court restructuring plans” (Economist 2009). And yet another article argues that credit default swaps, and negative basis trades in particular, make investors “indifferent to an insolvency” and less likely to approve an out-of-court restructuring than they might otherwise be (Morgan 2009).

The following pages analyze the issues and implications raised by the empty creditor hypothesis. There are reasons to question the hypothesis' plausibility on grounds of logic as well as of evidence.

## The nature of derivatives technology

Derivatives are financial instruments that transfer risk between parties to a transaction; they are called derivatives because they derive their value from that of an underlying financial variable. Derivatives are generally classified into two categories. One category is exchange-traded derivatives, generally called futures or listed derivatives, which are highly standardized instruments that are traded on centralized exchanges. The other is over the counter (OTC) derivatives, which are customized risk transfer instruments that are negotiated and executed bilaterally instead of centrally; credit default swaps fall into the OTC category. Both exchange-traded derivatives and over-the-counter derivatives are used by market participants to lay off unwanted risks and to take on desired risks.

The growth of derivatives over the last quarter century has had lasting effects on risk management, effects that may be summarized as derivatives technology. There are two essential elements of derivatives technology. The first is *risk decomposition*, which consists of the identification and unbundling (“stripping out”) of risks (Hull 2009, p. 15); and the second is *risk transfer*, which consists of dispersing risks among financial market participants by means of hedging. Given these two elements, the application of derivatives technology is feasible when it is possible to identify and isolate particular risks as well as to locate parties willing to take on or shed these risks.

A characteristic of derivatives technology is that it views financial products as bundles of different risks that can be taken apart and managed separately. A foreign currency denominated bond, for example, would not be viewed as a discrete product category but instead as a bundle of interest rate, currency, and credit risk. A bondholder can strip out the interest rate risk by means of a cross-currency interest rate swap (or asset swap), and can strip out the credit risk by means of a credit default swap, or strip out all three by means of a total return swap; the result is flexibility for the bondholder in what risks he actually bears. Further, financial institutions generally manage risks instead of products, that is, they identify common risks in the various financial instruments on their books, strip out the risks, and transfer the risks internally to be managed by specialized business groups. An institution holding a globally diversified portfolio of corporate bonds, then, would not necessarily hedge risks of each type of bond on a separate desk, but would assign common risks across different bonds to the dollar interest rate risk desk, the dollar-euro desk, the dollar-yen desk, the credit desk, and so on.

## Derivatives and capital structure

Hu and Black have extended the unbundling principle behind derivatives technology to the corporate capital structure and how derivatives might affect the incentives of principals and other market participants. They first looked at the relationship between

derivatives and equity ownership (Hu and Black 2006, 2007) and developed the concept of the hedged shareholder as "empty voter." Just as derivatives participants view financial instruments as bundles of risks, Hu and Black describe equity ownership as a bundle of rights. Some of the rights are voting rights, and others concern the economic exposure to the profits and losses from owning equity shares (economic ownership); full ownership consists of both voting rights and economic ownership. Derivatives technology makes it possible for a shareholder to unbundle ("decouple") economic exposure and thereby to reduce or eliminate economic ownership. The result is what Hu and Black call an empty voter, whose incentives will be altered in a manner similar to that found in traditional principal-agent conflicts (Jensen and Meckling 1973). The concept of the empty voter has arguably influenced recent regulatory decisions in the United Kingdom and Switzerland, and has also attracted regulatory interest in the United States (Hu and Black 2008a).

More recently, Hu and Black have extended a similar logic to corporate debt (Hu and Black 2008a, 2008b). According to Hu and Black's analysis, debt is a bundle consisting of "economic" exposure, primarily in the form of interest and principal repayments and the associated interest rate and default risk, as well as "non-economic" rights under contract, bankruptcy, and corporate law. The precise terms of non-economic rights under a debt contract would depend on the specific documentation agreed between the borrower and the original lenders, but could include, for example, enforcement of covenants as well as voting rights under loan agreements or bond indentures on covenant or default waivers. Similarly, rights under bankruptcy law include voting rights on declaring bankruptcy and on decisions made after bankruptcy such as voting on reorganization or liquidation plans. And just as derivatives make it possible to unbundle risks from each other, credit derivatives and other financial technologies such as securitization enable a creditor to shed economic exposure to the debt ("debt decoupling") while retaining voting and other non-economic rights. The result is an "empty creditor." Hu and Black go even further, however, and consider the possibility that a bondholder might set up a hedge that is larger than the underlying bond amount. The result is a creditor with "negative net economic ownership," which creates "incentives to reduce the value of all debt claims" and otherwise alters the creditor's incentives regarding the debtor firm. The resulting incentive effects may be undesirable, according to Hu and Black, because "control rights should be held by those with an incentive to increase the value of the firm, or at least the value of a particular class of debt claims" (Hu and Black 2008a p.734).

Hu and Black argue that the incentive effects of hedged credit occur in two areas, namely, exercise of contractual rights outside bankruptcy, and exercise of legal rights within bankruptcy. With regard to exercise of rights outside bankruptcy, the primary problem appears to be that hedged creditors might "have weaker incentives to cooperate with troubled corporations to avoid collapse" (Hu 2009), and might even "prefer that a firm fail, and hence oppose an out-of-court restructuring", because the failure would trigger compensation under the credit default swap. With regard to rights in bankruptcy, the problem is apparently that empty creditors no longer have an interest in maximizing the value of the firm, and as a result might vote for "less efficient decisions on liquidation versus continuation, or on post-reorganization capital structures" (Hu and Black 2008b, p. 684).

Finally, Hu and Black argue that empty crediting might have systemic risk implications. The first reason is that debt decoupling will lead to a "freezing" of relationships between debtors and creditors because empty creditors will have less incentive to renegotiate troubled credits; for the economy as a whole, this rigidity means greater systemic risk. The second is the familiar argument that the ability to hedge credit risk makes creditors less attentive to the quality of those to whom they lend. Third, debt decoupling and empty crediting might have adverse effects on market liquidity, mainly because debt decoupling would tend to disperse liquidity among more players and therefore increase the difficulty of addressing a systemic liquidity crisis. Some of these effects are familiar arguments that have been aimed at credit derivatives: Risk transfer means that no one knows who ultimately bears credit risk, dispersion of risks among a wide spectrum of institutions increases the difficulty of coordinating a collective response to a systemic crisis, and liquidity problems in credit derivative markets may lead to illiquidity in underlying bond and loan markets. But in addition, the supposed increased rigidity of debtor-creditor relations mean that liquidity in the form of refinancing might tend to dry up during downturns, which is when liquidity is needed most.

Hu and Black do not propose that hedging credit be banned or otherwise subject to specific restrictions, but suggest disclosure instead (Hu and Black 2008a, pp. 734-735). Disclosure would take place at two levels. One level is disclosure in bankruptcy proceedings of hedges and other forms of decoupling that create a gap between nominal debt ownership and net economic exposure. The rationale for the disclosure is to inform courts and other parties to a bankruptcy of actual economic interests, and Hu and Black suggest the possibility of limiting voting rights to creditors with positive net economic exposure. The other level of disclosure is meant to address systemic risk concerns. Although Hu and Black are vague on specifics, they suggest the possibility of delayed disclosure, similar to post-trade transparency, of hedged debt positions. The rationale at the systemic level is to "let market participants decide which counterparties to trust."

Hu and Black's articles on the empty creditor hypothesis give little in the way of specific examples of how the hypothesis might manifest itself in practice. Indeed, Hu and Black acknowledge that they rely "on possibilities, rumors, practitioner articles (which often don't name particular instances), and conversations with bankruptcy lawyers, bankruptcy judges, and other knowledgeable market participants" (Hu and Black 2008b, p. 679). Hu does cite one example in support of the hypothesis, but the example stems not from a credit event but instead from the circumstances leading up to the AIG bailout. Specifically, Hu argues that Goldman Sachs, which had bought credit default swap protection on AIG, was willing to demand full collateral from AIG even though doing so could cause liquidity problems for AIG (Hu 2009). Goldman presumably might have hesitated to demand collateral had it not already hedged its credit exposure.

## Analysis of the empty creditor hypothesis

The empty creditor hypothesis has, as noted above, generated significant interest in the press and among legal practitioners. Because the hypothesis could influence future regulatory policy, it is necessary to analyze both the logic and the evidence in support of it. Based on the arguments presented above, one might propose three more specific and operational hypotheses that are implied by Hu and Black's arguments on empty creditors.

The first hypothesis is based on Hu and Black's concerns about how hedging can affect creditor decisions under the Bankruptcy Code:

> Suppose a creditor is fully hedged, with zero economic interest. The Code assumes that creditors will act to further their apparent economic interest, and will favor a bankruptcy filing only if they expect to receive more in bankruptcy than in an out-of-court restructuring. However, an empty creditor may prefer to force the company into bankruptcy, rather than agree to a restructuring, because the bankruptcy filing will trigger a contractual payoff on its swap position. (Hu and Black 2008a, p.732)

One press article pushed the point further, claiming that investors in negative basis trades during late 2008 and early 2009 (see sidebar on Basis trading) were indifferent as to whether a firm defaulted or not, but were unlikely to approve an out-of-court restructuring because it would nullify the benefits of the basis trade (Morgan 2009; see also Yavorsky 2009). The first hypothesis is therefore that hedged creditors should be less likely to approve an out-of-court restructuring than unhedged creditors, thereby forcing the distressed firm into bankruptcy. If this hypothesis is true, then one would expect to see few restructurings among firms on which credit protection is widely available.

The second hypothesis concerns over-hedging, not simply to protect against the consequences of default but to benefit from it:

> Suppose, for example, that a hedge fund, bank, or other investor holds $200 million of a company's bonds, but is also long a $500 million notional amount in credit default swaps on this debt. The investor has negative net economic ownership, and thus has an incentive to act to cause the company to fail—for example, to oppose an out-of-court restructuring—because it will benefit more from its swap position than it will lose from its bonds. (Hu and Black 2008a, p.731)

*The Economist* picked up on the theme, arguing that one can make insolvency more attractive than solvency—that is, create a negative economic interest—by buying "a material amount of a firm's debt" and then buying protection on several times the face amount (Economist 2009). Based on these arguments, the second hypothesis is that hedged creditors will have incentives to buy protection with a face amount exceeding the amount of debt owned, that is, build up negative economic ownership.

A third hypothesis concerns behavior following filing for bankruptcy. Hu and Black suggest that "Voting by empty creditors in bankruptcy can lead to less efficient decisions on liquidation versus continuation, or on post-reorganisation capital structures" (Hu and Black 2008b, p. 684). Alternatively stated, the hypothesis is that creditors that have bought protection will be indifferent to the value of the bankrupt firm, which leads to inefficient decisions on restructuring versus liquidation.

This Note will not advance a hypothesis on systemic risk implications because it depends on the plausibility of the empty creditor hypothesis itself. If the empty creditor hypothesis does not withstand scrutiny, the systemic risk implications fall as well.

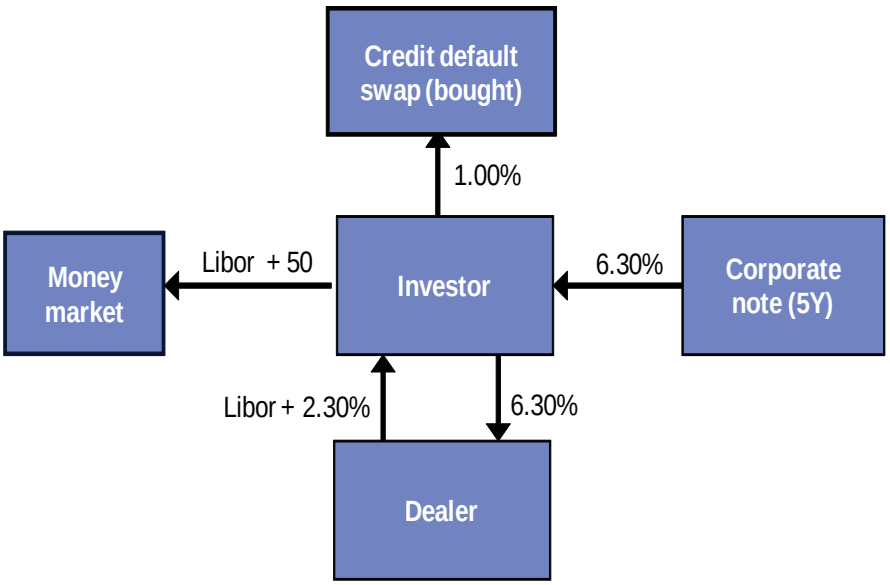
# Basis trading and credit derivatives

Basis trading is an arbitrage—or, more precisely, relative value—trading strategy that consists of the purchase of one instrument and the sale of another; the objective is to exploit a perceived mispricing of one or both the instruments. In credit markets, basis trading consists of an asset-swapped bond position and an offsetting credit default swap position. Because basis in credit markets refers to the difference between credit default swap spreads and asset swap spreads, basis trading in credit markets attempts to profit from differences between the two spreads.

The reasons for basis trading lie in the nature of an asset swap, which combines a fixed-rate bond with an interest rate swap. The party that owns the bond pays the coupon into an interest rate swap with a similar maturity to the bond. Because the bond coupon is typically larger than the current swap rate for that maturity, the Libor leg of the swap is increased by a spread equal to the difference between the underlying bond coupon rate and the interest rate swap rate prevailing on the trade date. The interest rate swap effectively strips out the interest rate risk of the bond, so the bondholder is left mainly with the credit risk of the bond (along with some counterparty credit risk on the swap). The asset swap spread therefore compensates the bondholder for the credit risk of the bond; for this reason, the asset swap spread should be related by arbitrage to the credit default swap spread. Basis trading arises from the expectation of some degree of convergence of the spreads.

Figure 1 shows a hypothetical negative basis trade package. The investor buys the bond, usually at par, and the coupon is paid into an interest rate swap; the combination forms the asset swap. The floating rate is adjusted for the difference between the bond coupon and the par interest rate swap; the resulting spread over Libor is known as the asset swap spread. After accounting for the cost of funding, the investor profits by the difference between the excess, known as negative basis, of the asset swap spread over the credit default swap spread; in the example, the negative basis is 130 basis points before funding, and the net profit after funding is 80 basis points. If the basis decreases in absolute value—because of either an increase in credit default swap spreads or a fall in asset swap spreads or both—the investor can unwind the package at a profit. But if the bond issuer were to default, the investor would be compensated under the credit default swap but might face losses if the interest rate swap were out of the money or if the proceeds of the investment can only be invested at a lower rate than before (Yavorsky 2009).

Other things equal, basis trades have the effect of leading to increased convergence between asset swap spreads and credit default swap spreads. Although there are many factors working against convergence of the two spreads (Choudhry 2006), the asset swap spread is often considered to be the "benchmark for the fair pricing" of a credit default swap (Cilia 1996). To the extent the spreads do converge, the result is higher market efficiency in that credit spreads, both on bonds and CDS, provide more accurate information to market participants on the cost of credit.




**Assume:**
5Y USD interest rate swap rate = 4.00%
Par bond coupon = 6.30%
⇒ Asset swap spread = 2.30%

*Exercise of contractual rights prior to bankruptcy*. As traded contracts, credit default swaps enable hedged creditors of a distressed firm to realize a profit prior to any bankruptcy filing by unwinding their hedge positions: Because credit default swaps are not insurance contracts, they do not require that a loss event occur before compensation can occur. But once the creditors have unwound their hedges, they face two options. One option is to sell the bonds at their current value, in which case these former creditors will have no further interest in the outcome. The other option is to hold on to the bonds, in which case the creditors will have incentives to maximize recovery value; failure to do so would be "leaving money on the table." Among hedged creditors that do not unwind their credit default swaps, however, the essential choice is usually between restructuring outside bankruptcy and restructuring within bankruptcy.[1] Both have their advantages for creditors, but the empty creditor hypothesis implies that hedge creditors are less likely to approve an out-of-court restructuring than unhedged creditors.

The advantages of restructuring outside bankruptcy include a more favorable recovery rate than is typically experienced within bankruptcy (Altman and Karlin 2009) as well as avoidance of the often substantial administrative and legal costs of going through the bankruptcy process (Altman and Hotchkiss 2006, chap. 4). Although restructuring was a standard credit event for credit default swaps in North America until April 2009 (Mahadevan 2009) and still is in most other markets, out-of-court restructurings as discussed here have not triggered credit default swaps. The primary reason is that the ISDA documentation provides that a restructuring credit event must bind all holders; the terms of the restructurings mentioned in this article, in contrast, were binding only on those investors that accepted the terms (ISDA 2003, Section 4.7; Altman and Karlin 2009).

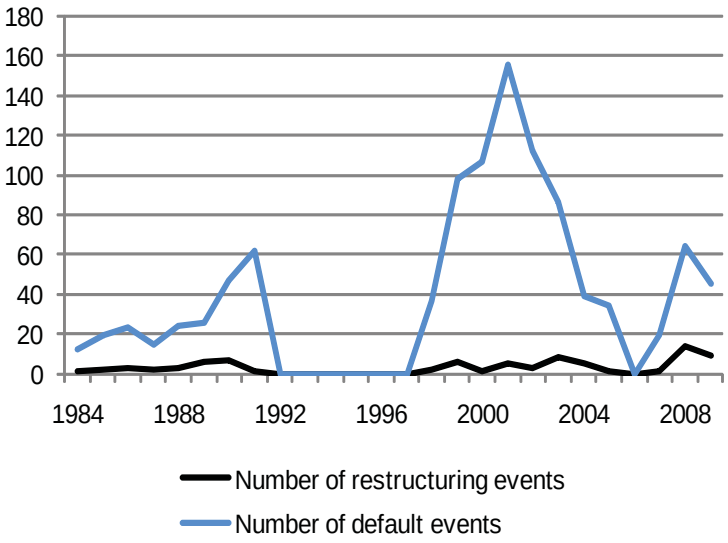
But bankruptcy also has advantages for creditors, one of which is the automatic stay, which prevents the "tragedy of the commons" problem of creditors rushing all at once to seize assets (Hardin 1968). In addition, creditors in general benefit from the ability to bind all parties to a restructuring plan instead of allowing dissident creditors to free ride on the restructuring while retaining the pre-restructuring claim. And bankruptcy provides benefits to other stakeholders as well, such as access to debtor-in-possession financing, which has priority over existing debt and equity claims, and the ability to escape, with court approval, burdensome contractual obligations (Betker, Franks, and Torous 1999).

Empirical studies suggest that firms with complex capital structures characterized by different classes of debt outstanding are likely to find it difficult to obtain approval for a restructuring plan that satisfies all classes of creditors (Gilson, John, and Lang 1999). Further, the ability to escape some contractual obligations suggests that one would expect out-of-court restructuring to be more likely for firms that do not face substantial pension liabilities, burdensome labor contracts, of legacy obligations such as environmental clean-up costs or asbestos settlements. In summary, many factors influence the likelihood of an out-of-court restructuring even before considering the effect of hedging using credit default swaps.

[1] In the remainder of this Note, "restructuring" will refer to out-of-court restructuring and not to restructuring in bankruptcy.

Given the above considerations, the salient policy issue is whether hedging with credit default swaps leads systematically to restructuring in bankruptcy even in cases where out-of-court restructuring would have been more efficient. A full analysis of the relationship between likelihood of restructuring and availability of hedging with credit default swaps should ideally hold the above factors constant. Such an analysis would require extensive data collection, however, and is beyond the scope of this note. Instead, the present analysis will consider the frequency of defaults and restructurings, both before and after the availability of credit default swaps. Altman and Karlin (2009) contains data on defaults and restructurings from 1984 through May 2009. Chart 1 shows number of default events and of restructuring events from 1984 through May of 2009, while Chart 2 (following page) shows restructuring events as a percent of total default events over the same period.[2] The charts show no obvious pattern. Chart 1 shows three periods during which defaults spiked: The first occurred in 1990, which preceded the existence of credit default swaps; the second was centered in 2001, during which credit default swaps were available but the market was not yet liquid; and the third was in 2008 (and possibly 2009), by which time credit default swap markets had evolved into their present highly liquid form. Chart 2 shows that, of the three periods, restructurings were most common relative to all default events during the third period.[3]

**Chart 1: Default and restructuring events, 1984-2009**
Source: Altman and Karlin (2009)

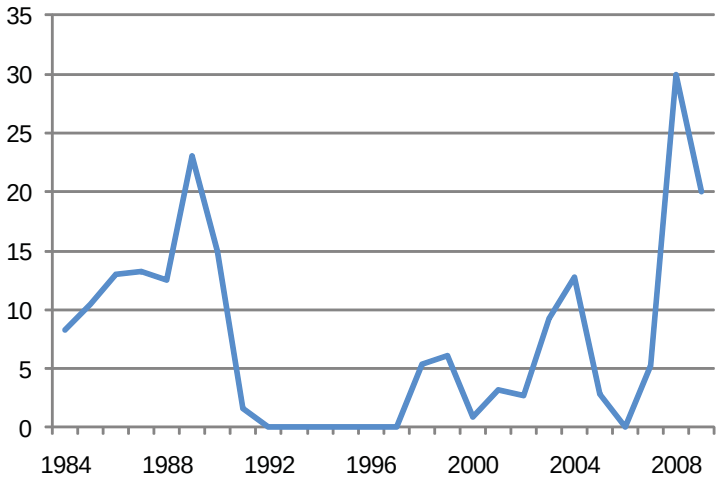



Further, one would expect that, if the ability to hedge using credit default swaps tends to make restructurings less likely than a bankruptcy filing, the correlation between number of defaults and restructurings as a percent of defaults should be lower when credit default swaps are available than when they are not. The data show that the correlation between number of defaults in a given year and restructurings relative to defaults in the same year is about 9 percent over the entire sample period. But restricting attention to

[2] Altman and Karlin (2009) consider a restructuring, which they refer to as a distressed exchange, to be a default even though it avoids a formal bankruptcy filing.

[3] Using dollar value of restructured debt instead of number of default events, the third period shows even greater prevalence of restructuring. Because the GMAC restructuring is largely responsible for that result, this Note focuses only on number of defaults.

**Chart 2: Restructuring events as a percent of number of default events, 1984-2009**
Source: Altman and Karlin (2009)




the period of liquid credit default swap markets, which arguably began in 2003 with the publication of the 2003 ISDA Credit Derivative Definitions and the subsequent initiation of trading in the CDX and iTraxx credit indexes, the correlation jumps to 90 percent. While correlations within small data sets should be interpreted carefully, the correlation statistics presented here would not appear to support the empty creditor hypothesis, according to which the availability of credit default swaps would make restructurings less likely.

Further evidence comes from the list of restructurings that occurred during 2008 and the first half of 2009; Appendix 1 contains a list of restructurings and their subsequent fates during that period. During that time, twenty-one firms underwent out-of-court restructurings; credit default swap protection was available on eleven of them (52 percent). And of the restructurings that occurred during that period, four subsequently filed for Chapter 11 bankruptcy; of those four, two had liquid CDS available and two did not. Again, the evidence thus far does not appear to support the empty creditor hypothesis.

*Negative economic ownership*. The other implication of the empty creditor hypothesis for behavior prior to bankruptcy is that hedged creditors will not only be indifferent to the value of the distressed firm, but might even benefit from failure by building up credit default swap hedges for which the face amount exceeds, possibly by an integer multiple, the face amount of debt owned. Even more than in the above case, it is argued, hedged creditors will have incentives to favor bankruptcy over out-of-court restructuring. Essentially, the issue here is that investors in a position to influence the fate of a distressed credit can profit systematically from the use of credit default swaps; the result is bankruptcies where other alternatives might have been preferable. Overhedging magnifies this effect by in effect creating a leveraged protection position.

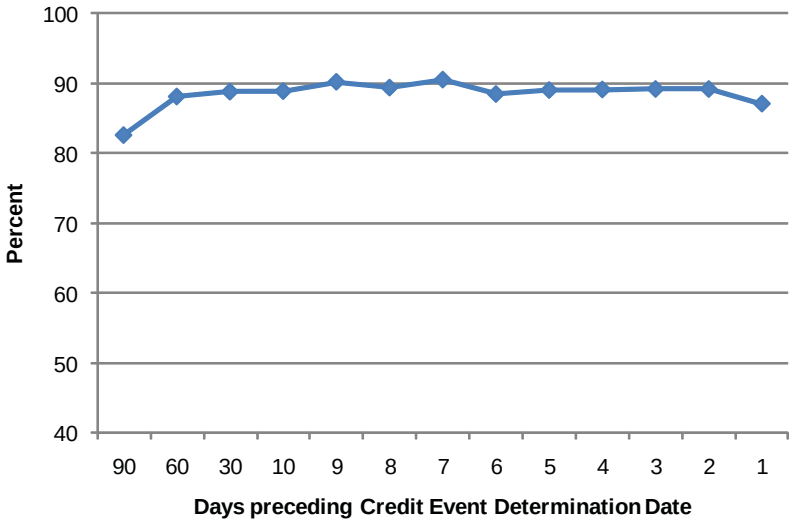
It is not possible to determine from available data whether overhedging is a significant activity, or indeed if it occurs at all. But one may reasonably question the plausibility of the second hypotheses on the basis of how the credit default swaps market treats distressed credit. If an investor were actually to try to build up a negative economic ownership position through overhedging, the strategy would be expensive and unlikely to yield a high return. Setting aside the possibility of trading on insider information,

which is itself illegal in most jurisdictions, an overhedging strategy is likely to be profitable only if an unusually prescient hedger were to foresee accurately the failure of an investment grade company while the company's credit default swaps still traded at a low spread. In such a case, the gain might be regarded as a windfall but would not lead to behavior that might affect the functioning of credit markets. And if the anticipated bankruptcy did not occur, the large hedge position could lead to large losses.

It is not clear, however, how an overhedging strategy might be exploited systematically in a way that could distort credit markets or the bankruptcy process. As a firm begins to experience distress, both bond and credit default swap prices incorporate the expected losses from insolvency. In the bond market, expected losses lead to lower bond prices; in CDS markets, they lead to higher spreads. Further, credit default swap market practice for distressed credits is for protection buyers to pay sellers an up-front payment followed by a 500 basis point annual coupon for the life of the transaction; the up-front payment is equal to the default-adjusted present value of the excess of the conventional spread over 500 basis points over the life of the swap.[4] Essentially, the protection buyer prepays a large part of the expected compensation.

Charts 3 through 6 show up-front payments and pre-default bond prices for two distressed credits—Abitibi and Lyondell—that eventually defaulted; similar data for other credit events are available from the Markit CDS website (www.markit.com/CDS). For example, an investor who attempted to build a negative interest in Abitibi debt in November 2008—Abitibi actually defaulted in March 2009—would have been required to pay 83 percent of the face value of the debt up-front and then pay 500 basis points per year for the life of the hedge. If the underlying position were $10 million and the bondholder had wanted to build up a negative interest by, say, buying protection equal to twice the face value of the underlying debt, it would have been necessary for the bondholder to make a payment of $16.6 million up-front and then pay $250,000 every three months. Given that default did occur, the investor could profit but, as with any leveraged position, if default had not occurred losses would have been substantial.

**Chart 3:**
**Upfront credit default spreads, Abitibi**
Source: Markit




[4] Up-front payments followed by standardized coupons became standard market practice for all trades, not just those referencing distressed credits, in April 2009.

**Chart 4:**
**Pre-default bond prices, Abitibi**
Source: Markit

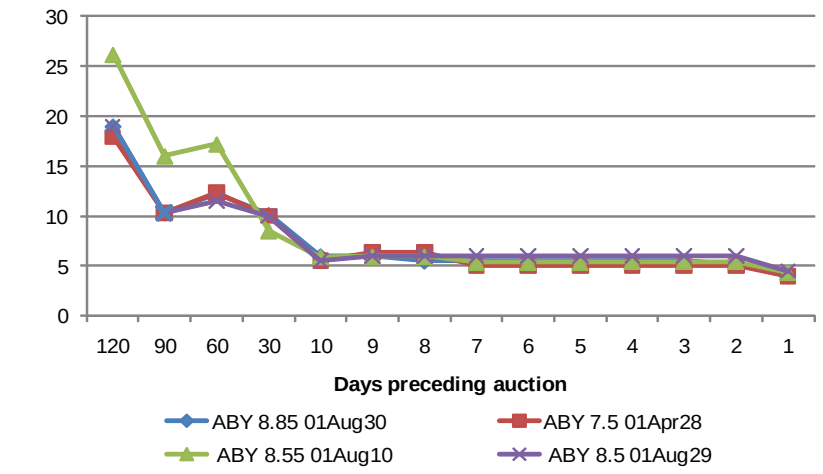



**Chart 5:**
**Up-front credit default swap spreads, Lyondell**
Source: Markit

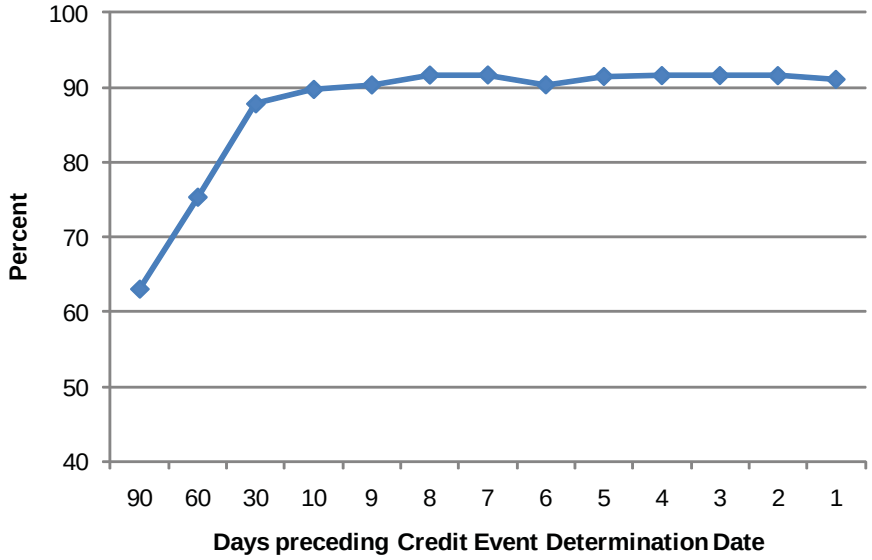
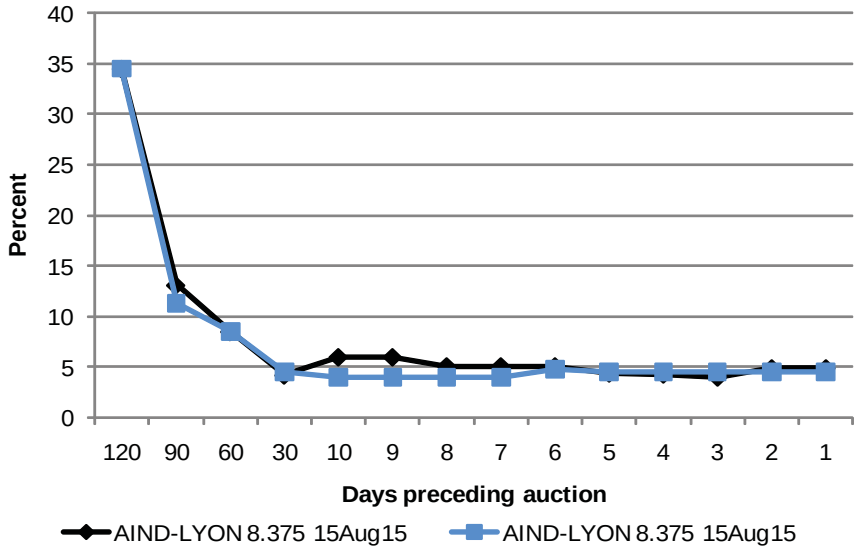



**Chart 6:**
**Pre-default bond prices, Lyondell**
Source: Markit



Further, it is not clear how the investor would have been in a position to influence the likelihood of a bankruptcy, and thereby make a positive return more likely, other than by failing to support a restructuring if one were proposed. And as shown already, the evidence regarding restructurings does not support the contention that credit derivatives have had a negative effect on restructurings.

*Exercise of legal rights within bankruptcy*. The third hypothesis, that hedged creditors are indifferent to the value of the firm after bankruptcy, seems implausible on its face. Once a firm files for bankruptcy, a credit event has occurred and the credit default swap settlement process begins. Under physical settlement, which was was routinely used to settle credit events until mid-2005, the protection buyer delivered the defaulted bond to the protection seller in return for payment of the bond's par value. There was no incentive for the hedged creditor to manipulate the price of the defaulted bond because the payment amount was always the par value.

Under cash settlement, which is now the standard method of credit default swap settlement, protection sellers pay the loss amount to buyers. The loss amount is the par value of the defaulted bonds minus the value of the bonds determined from a settlement auction. Under the auction procedure, participants submit bid and offer prices for the defaulted bonds and the resulting post-default price is used as the basis for compensation for losses. The auction procedure includes safeguards, such as penalizing crossed bids and offers as well as requiring that bid and offer prices be within a fixed spread of each other to deter aggressive bidding to manipulate the auction results. Settlement generally occurs within thirty or fewer days of the Credit Event Determination Date that follows the bankruptcy filing. There is no requirement for delivery of the defaulted bond. Once settlement occurs, the credit default swaps on the defaulted bonds terminate so there is no further possibility of compensation under the contracts.

Even though crucial decisions in the bankruptcy process might be made prior to settlement, especially in pre-packaged filings, the cash settlement process essentially decouples compensation from ultimate recovery. Prior to settlement, the auction procedures make it difficult of participants to manipulate the auction process in order to increase the loss amount. And following settlement, hedged creditors have been compensated for their losses and now have the choice of either selling the defaulted bonds at the current price or else retaining the bonds and engaging in the bankruptcy workout process. Rational bondholders in this case have incentives to maximize recovery values.

## Conclusion

Hedging is not free. A bondholder who chooses to hedge credit exposure by buying credit default swap protection must forego some or all the return on the bond. The bondholder might hedge to exploit some perceived mispricing of the bond or credit default swap, but the most common rationale for hedging is to avoid a more severe loss that would arise from default. If a bondholder decides to pay for protection against default, it is difficult to understand why one should object. Yet as the earlier press quotes attest, many do object, and some of the objections are based on the Hu and Black arguments described above.

The empty creditor hypothesis appears to be based on an analogy of dubious validity with the idea of empty equity ownership. Although appealing on the surface, the empty creditor hypothesis is not consistent with either the way credit default swaps work nor with observed behavior in debt markets. Further, the lack of compelling examples calls into question the validity of the hypothesis.

At most, it is possible that a debt holder who correctly anticipated deterioration in the value of his bonds in advance of the market might, under current credit default swap terms, oppose an out-of-court restructuring in favor of bankruptcy for the simple reason that a restructuring could lead to an economic loss while bankruptcy would trigger a credit event and lead to full compensation. By choosing to hedge, the investor chose to pay for protection and in so doing gave up some or all the return on the bond. It is not clear why the investor's preference for bankruptcy is undesirable so long as it could not be systematically exploited across the market.

Given the widespread attention given to the empty creditor hypothesis and its potential implications, one hopes the subject will attract more serious research efforts. In particular, it would be useful to look further for evidence in support of the hypothesis as well as evidence that might refute it. More important, although hedging might affect behavior because it changes one's risk exposure, it also involves a foregone opportunity. Only if such hedging could lead to systematic opportunities that might distort economic behavior or the functioning of legal institutions should it be treated as a cause of concern.

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## Appendix
**Restructuring events in 2008 and through May 2009**

| Name | Restructuring date | Subsequent development | Bankruptcy date | Liquid CDS available? |
|---|---|---|---|---|
| Ainsworth Lumber Co., Ltd. | 7/29/2008 | Still operating | NA | No |
| American Achievement Group Holding | 2/25/2009 | Still operating | NA | No |
| Clear Channel Communications | 12/23/2008 | Still operating | NA | Yes |
| CMP Susquehanna Corp. | 4/3/2009 | Still operating | NA | No |
| Finlay Fine Jewelry Corp. | 11/25/2008 | Still operating | NA | No |
| Ford Motor Co. | 4/3/2009 | Still operating | NA | Yes |
| Freescale Semiconductor, Inc. | 3/10/2009 | Still operating | NA | Yes |
| GMAC, LLC | 12/29/2008 | Still operating | NA | Yes |
| Harrah's Operating Co., Inc. | 4/8/2009 | Still operating | NA | Yes |
| Harrah's Operating Co., Inc. | 12/19/2008 | Still operating | NA | Yes |
| Hovnanian Enterprises, Inc. | 11/24/2008 | Still operating | NA | Yes |
| Intelsat Ltd. | 2/12/2009 | Still operating | NA | Yes |
| Metaldyne Corp. | 11/26/2008 | Chapter 11 | 5/27/2009 | No |
| Neff Corp. | 12/16/2008 | Still operating | NA | No |
| NXP B.V. | 3/30/2009 | Still operating | NA | Yes |
| OSI Restaurant Partners, LLC | 3/20/2009 | Still operating | NA | No |
| Primus Telecommunications Group, Inc. | 5/22/2008 | Chapter 11 | 3/16/2009 | No |
| R.H. Donnelley Corp. | 6/20/2008 | Chapter 11 | 5/28/2009 | Yes |
| Residential Capital, LLC | 6/4/2009 | Still operating | NA | Yes |
| Sensata Technologies B.V. | 3/30/2009 | Still operating | NA | No |
| Six Flags, Inc. | 6/11/2008 | Chapter 11 | 6/15/2009 | Yes |
| Tekni-Plex, Inc. | 6/2/2008 | Still operating | NA | No |

*Adapted from Altman and Karlin (2009) with permission from author; availability of liquid CDS based on either (1) DTCC Trade Information Warehouse list of top 1,000 reference entities as of 10/31/2008, or (2) spread quotes available on Bloomberg as of 1/1/2008.*

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