



## Credit Default Swaps and Their Market Function

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Credit derivative instruments allow default risk to be segregated from debt of all kinds. They have granted investors the ability to hedge their portfolios and provided numerous institutions with a new source of income. However, the market for credit default swaps is neither transparent nor regulated, perhaps undermining the stability of the financial system it has helped innovate.

In the context of the current recession and the accompanying financial crisis, one hears of a vast number of innovations in the products that investors and banks can use for handling various risks. Since the 1997 invention of the credit default swap (CDS), assuming and removing credit (or default) risk from a portfolio of assets has become a major risk management tool of the world's largest and most dominant institutions, both financial and nonfinancial.

The broad use of credit default swaps by market participants has been an important development, and their widespread adoption and integration into financial markets has fundamentally reshaped the risk management landscape of domestic and international finance. Yet the collapse of Lehman Brothers in 2008 and the government bailout of the insurer American International Group (AIG) revealed the systemic risks that CDSs can pose in their current form.

In the case of AIG, the company's aggregate exposure to credit derivatives was not revealed to the market and regulators until it was already on the verge of a CDS-induced bankruptcy. The lack of sufficient transparency in the derivatives market and regulation prevented these warning signs from being conveyed appropriately prior to near-catastrophe.


Market opacity played a role in the settlement of Lehman Brothers CDSs as well. The investment bank's bankruptcy meant that CDS sellers would be forced to pay out tens of billions of dollars, but it was unclear which sellers ultimately held the exposure, and whether they would be able to pay given the stressed financial environment. Fortunately, the settlement did not breed further turmoil, but the episode highlighted the danger of an opaque, unregulated market failing to operate under—and even contributing to—conditions of extreme systemic distress.

By enabling investors to subtract or accumulate credit exposure in their portfolios, credit default swaps have provided a valuable function in markets and will likely continue to do so, albeit within a new regulatory structure. This *Commentary* explains how CDSs work, why they are useful for shedding risk or speculating on market conditions, and why CDS markets might need to be reformed.

### Defining a Credit Default Swap

At its most fundamental level, the CDS is analogous to an insurance contract, though it differs in ways that are important in understanding how they are used. An insurance contract might insure a homeowner by providing a payment in the event of a house fire. The homeowner pays premiums at set dates, and if a fire occurs, the premiums stop and the insurance company pays the homeowner the claim, which depends on the amount of damage done to the house. In the same way, a CDS “insures” the holder of the contract against a corporate default. In exchange, the writer of the CDS contract receives “premium” payments. However, the analogy with insurance extends only so far. One major difference between the two contracts is that the CDS can be bought by a person who does not actually hold the underlying asset (a bond). (Imagine trying to buy insurance for a house that one does not own!) Consequently, the total value of CDS contracts can (and frequently does) exceed the amount of outstanding debt being insured.

Defaults of corporations—called reference entities with regard to the CDS instrument—are the most common events these contracts are written against, but protection can also be bought against the default on the debt of sovereign nations, including the United States.



In a typical transaction, the seller of the protection takes on the credit risk associated with a reference entity in return for a quarterly premium paid by the buyer. The premium, or spread, is quoted as the total annual payment divided by the face amount of the reference entity's debt that is being protected. CDS premiums are quoted in basis points per year (where one basis point equals 0.01 percent), usually for a standardized contract protecting \$10 million, with a contract life of five years. So, if a bank holds \$20 million of a company's bonds and a CDS for that company is selling for 100 basis points (1 percent), it would cost the bank \$200,000 a year to protect itself against default on the bonds for five years.

As in a house fire, where the insurance covers only the damage on the house, a credit default swap covers the "damage" caused by the default. Thus, if a bond is worth only 60 cents on the dollar in the event of a default, the seller of the CDS will pay the remaining 40 cents.

The amount paid can be determined in one of two ways. One is that the holder of the CDS contract can present the seller with the defaulted bond, which is then exchanged in a physical settlement for its face value. A second method of settling is for the difference between the face value and the market value of the referenced corporation's debt to be paid to the holder of the contract in a cash settlement.

The fundamental difference between the methods is that one (physical settlement) requires that the underlying asset be presented to receive reimbursement. At times, the market value of the debt after a default can be difficult to determine because the underlying bonds are no longer traded, and in such cases, the large sellers of the contracts hold an auction. Buyers and sellers of the underlying bonds submit bid and offer prices to the auctioneer, who then determines a settlement price—or recovery value—for the securities. For instance, if the auction settles on a recovery value of 20 cents on the dollar for the bonds, a CDS seller would be obligated to make bondholders whole by paying out the other 80 cents.

### Improved Hedging through Credit Default Swaps

CDSs are derivative instruments because their financial value is derived from the value of an underlying financial asset, usually a bond. The ability to trade derivatives allows the various risks of an asset to be transferred to counterparties willing to bear them without the underlying asset being involved in the trade—or even being held by either the buyer or the seller. CDS contracts represent the exchange of a specific risk—corporate or sovereign default—between two investors making opposite bets, the CDS seller who bets the borrower will not default, and the CDS buyer who bets it will. This exchange of risk leads, naturally, to investment hedging, an important use of CDSs.

Suppose a long-term investor owns a sizable dollar amount of bonds of a company. Leaving aside the risk that interest rates might vary substantially during the life of the bonds

(note that there are derivatives to protect against this risk, too), the primary risk for the investor is that the company will go bankrupt and not repay the principal on the bonds. To insure against this possibility, the investor can buy a credit default swap on the underlying bonds. If the company begins to show signs of financial trouble before maturity, the value of its bonds will fall, but the value of the investor's CDS contract will rise. The contract protects the investor from price movements in the bonds attributable to credit risk.

In terms of an overall investment portfolio, CDSs prevent value fluctuations that are due to changes in the credit quality of CDS-referenced investments. Portfolio managers can also hedge by buying real assets with default risk that is inversely correlated with the company's, but this would likely entail assuming new risks at the same time and otherwise affecting the balance of the portfolio. Buying a credit default swap is much more efficient since it eliminates the desired amount of credit risk specifically, without also creating new risks to hedge.

Because buying a CDS is a bet against the financial prospects of a corporation or sovereign, and selling a CDS is a bet for them, the contracts also provide speculators with a means of gaining exposure to (that is, placing bets for or against) these entities without purchasing the underlying assets. As CDS markets have developed, speculation in the markets has attracted negative attention, just as it did in the early days of the futures exchanges. But one must be cautious about assuming that speculation is necessarily a bad thing. Market making—trading with both buyers and sellers to maintain orderly transactions—is an essential property of a liquid market, and speculators deepen the CDS market and allow investors to more easily hedge credit risk with specific contracts.

In exchange, credit default swaps can be a source of income for those speculative institutions willing to bear their risk. The breadth of CDS sellers ranges from hedge funds to major financial institutions. The large insurer AIG and a number of smaller bond insurers have written billions of dollars' worth of CDSs on companies and mortgage securities since the introduction of credit derivatives. Commercial banks and investment banks also became heavily involved in the credit derivatives market amid the competitive (and often highly lucrative) environment of the banking industry in recent years.

### An Over-the-Counter Market

Credit default swaps are currently traded in the over-the-counter (OTC) market. A potential buyer contacts a seller directly and arranges a contract, including negotiation of the spread. OTC sales are thus bilateral arrangements between the buyer of the CDS and the seller. OTC contracts are advantageous to buyers because contracts can be specially tailored to handle the particular amount of credit risk that a buyer would like to hedge against for a particular amount of time.

Furthermore, the buyer and the seller can also work out some limited arrangements that reduce counterparty risk—that is, the risk that one or the other of the parties to the CDS agreement will default on the agreement. A counterparty default would occur if a buyer is unable to make contractual premium payments or if the seller is unable to pay out the notional value of the CDS in the event of a reference entity default. Many contracts contain provisions for collateral posting as CDS prices fluctuate, in order to offset the counterparty risk that increases along with the probability of default for the underlying bonds. That is, when the chance of paying out increases because the underlying bond is performing poorly, the CDS seller “puts money down” to offset the risk it will not fulfill its obligation.

However, the relative security gained from collateral posting is contingent upon the transparency of CDS pricing and the framework for enforcing these provisions. Generally, the CDS market lacks the strong transparency and enforcement mechanisms characteristic of futures clearinghouses and exchange-traded securities markets. Pricing is not transparent for contracts that trade infrequently because the OTC derivatives market lacks a centralized trading location that can quote an all-inclusive market price, as exchanges do. Instead, a quote must be constructed by surveying various dealers of the CDS contract of interest. Without clear pricing, the market value (and thus the necessary collateral requirements) of a given CDS contract is more difficult and time-expensive to determine than if the consensus price of the market was quoted by a centralized entity.

Perhaps more importantly, the OTC market’s lack of a centralized clearing system hampers any attempt to determine the size and location of credit risk exposure to a particular reference entity. Exiting or “unwinding” a contract is not a simple matter of trading the swap to a new counterparty as a unit, as one can a share of stock. The holder of a CDS looking to offload credit protection must write a new contract protecting a new counterparty, which on a net basis removes the exposure. That is, the original CDS buyer must hold two contracts that cancel each other out. Consequently, some portion of the enormous \$50 trillion number often associated with the size of the CDS market is redundant. It counts all contracts and does not account for the contracts that have been effectively canceled out by offsetting contracts.

Indeed, the double counting goes much further. Suppose an investor owns \$100 million of a corporation’s debt and decides to hedge it with a CDS bought from a broker. Since both buyer and seller are surveyed when assessing the size of the market, the outstanding CDS is counted as \$200 million. The broker then hedges her exposure by buying a CDS from a bank, which buys from a hedge fund that is willing to bear the default risk on the original corporation. So what should normally be thought of as \$100 million of exposure in the CDS market is listed as \$600 million in outstanding CDSs (three interconnected bilateral contracts, each double-counted).

Such chains of hedging are common, and more complex chains are not uncommon, complicating efforts to pin down the actual magnitude and “location” (those holders with a positive net buyer or seller position) of credit exposure. Figure 1 shows that the total notional amount of CDS exposure held by commercial banks in the United States is \$14.6 trillion, according to the Office of the Comptroller of the Currency. This number is subject to the double-counting problem.

Recent events show that the location, or distribution, of CDS exposure is of great concern. The near-meltdown of the financial system in September 2008 occurred largely because of AIG’s extensive CDS exposure. AIG had sold CDS contracts, referencing a large number of corporate entities and complex mortgage securities, to major commercial and investment banks around the globe. The insurer faced the aforementioned collateral requirements last September as the credit quality and liquidity of these securities became more suspect, and because the firm lost its triple-A credit rating. But without a substantial loan from the Federal Reserve, AIG would have been unable to meet the collateral calls and thus would have precipitated a massive counterparty default. This in turn would have hit dozens of large financial institutions and dangerously decapitalized them.

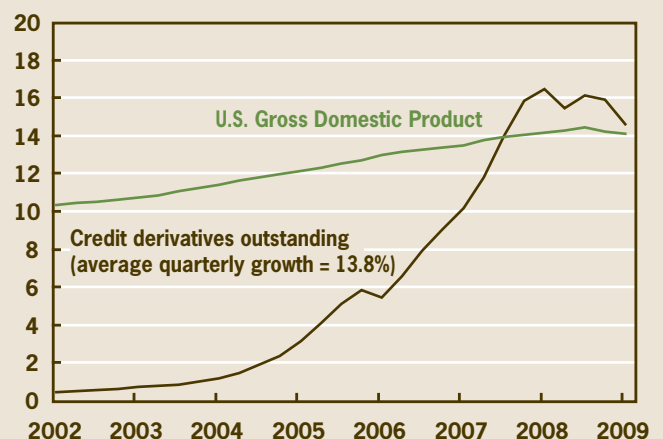
The key point is that the market’s opacity prevented market participants from knowing where an AIG counterparty default would fall, and to what extent. Such uncertainty contributed to the massive “run” on the entire financial system. The CDS market did not—and still does not—provide a clear picture of counterparty exposures throughout the financial system upon which investors and regulators can act.

### Systemic Consequences of CDSs

While CDS transactions allow the broad investor community (including banks) to add or subtract pockets of credit exposure from their portfolios, the realities of the current over-the-counter market for CDSs—with its minimal disclosure and acute vulnerability to counterparty risk—detract from the functional security

## 1. Commercial Bank Derivatives

Trillions of notional dollars, through 2009:Q1

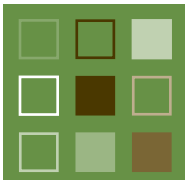


Source: Office of the Comptroller of the Currency, Bureau of Economic Analysis.

of a highly interconnected financial system. What's more, some have noted that the very existence of credit default swaps leads to skewed incentives for CDS-protected bondholders, who may be less inclined to monitor a borrower or participate in an out-of-bankruptcy restructuring if they know that they will be fully reimbursed in the event of default.

In spite of these systemic and market incentive issues, credit default swaps are unlikely to disappear from the financial scene any time soon. They have proved to be both useful

and lucrative. Because a great deal of the danger they pose has recently been borne by taxpayers, the CDS market is likely to see substantial reform. Reforms are likely to maintain most of the derivatives' functions while reducing their potential impact on financial stability and market competitiveness. Current proposals call for the creation of centralized clearinghouses or exchanges, which would go a long way toward extending transparency and standardization to the CDS and other derivatives markets.



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