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## Back-to-Basics: Credit Default Swaps

by Teri L. Geske

**I**n this back-to-basics article, we address the basics of credit default swaps. These instruments represent the majority (over 70 percent) of activity in the fast-growing credit derivatives market, with the notional amount of credit default swaps outstanding estimated at \$1.67 billion (as of year-end 2002), a 179 percent increase over the previous year.<sup>1</sup> Not only is the usage of credit default swaps increasing rapidly among a variety of financial institutions, prices for credit default swaps, which are quoted in terms of spreads, are becoming an important indicator of market levels and risk for corporate bond investors. So, we thought it would be useful to review these instruments from a theoretical and practical perspective.

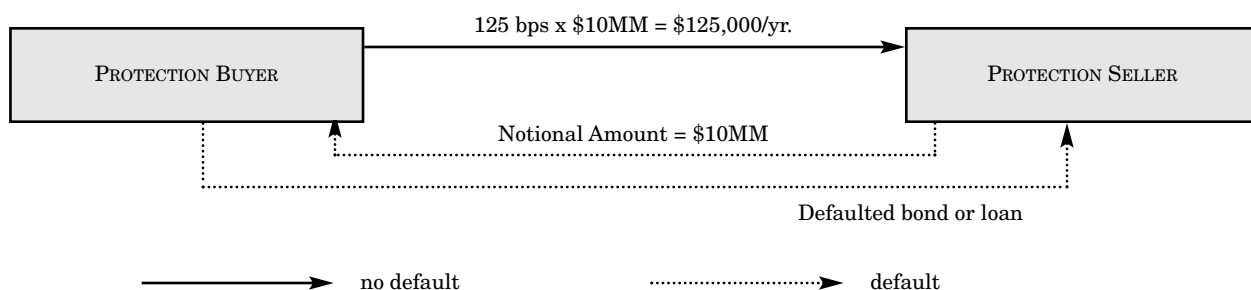
First, the mechanics. In a credit default swap, the protection buyer pays a periodic premium called the credit default swap spread to the protection seller in exchange for compensation in the event that a referenced asset defaults during a specified period of time, most commonly five years. If an event of default occurs (which we'll define shortly), the protection seller's obligation may be fulfilled in one of two ways, referred to as physical delivery or cash settlement. In the case of physical delivery, the protection buyer delivers the defaulted instrument (such as a bond, or a loan) to the protection seller in exchange for the full face value of the instrument. With cash settlement, the protection seller pays the protection buyer the difference between the face value and the post-default market value of the debt instrument (where the market value is determined by polling a number of dealers a specific number of days after the default has occurred). In either case, the buyer is protected from losses arising from the default. The following is a diagram illustrating the payment flow of a credit default swap on a \$10



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1) Source: *Risk Magazine's* annual credit derivatives surveys (published February 2002 and 2003).



million notional amount, where the default swap spread is 125 bps and we assume physical delivery if default occurs (see diagram above).

Under the current, standard International Swaps & Derivatives Association (ISDA) credit default swap agreement, an event of default is defined as a bankruptcy, obligation acceleration, failure to pay, debt moratorium/repudiation or restructuring. There is an ongoing controversy regarding the inclusion of "restructuring" as an event of default. In certain cases, banks that have purchased protection under a credit default swap are the same banks that have loaned money to an obligor and are therefore in a position to approve or accept a debt restructuring by that obligor, which would then trigger a payment under the default swap agreement. This situation creates a moral hazard, which is objectionable to credit protection sellers. Furthermore, there are some instances where a debt restructuring has arguably not resulted in financial harm to the debt holder and protection sellers object to paying under these circumstances. However, there are arguments to be made in favor of including restructuring as default event, and the issue is as yet unresolved.

What types of institutions use credit default swaps? Commercial banks, with their large portfolios of corporate loans, are the biggest participants in this market and are usually protection buyers. Insurance companies, both reinsurers and other insurers, represent a growing percentage of credit default swap

users, typically acting as protection sellers since insurance companies are accustomed to analyzing and accepting risk. Hedge funds are also active in the market. Selling protection via a credit default swap is similar to owning a corporate bond with the interest rate risk eliminated (it is equivalent to purchasing a corporate bond with funds obtained by shorting a duration-matched Treasury). Any change in value of this position would be due to a change in the credit quality of the corporate bond issuer. Similarly, buying protection is a way of shorting a corporate credit, which in the cash markets is usually not feasible. Other end-users include synthetic collateralized debt obligations (CDOs), whereby the exposure to one or more issuers is derived from selling protection under a credit default swap rather than from purchasing actual bonds. Synthetic CDOs are particularly popular in the European market where the corporate bond market is not as broad as it is in the U.S. Corporations themselves often buy protection against the default of obligors of trade receivables—for example, if Corporation X derives a significant percentage of its revenues from sales to Corporation Q, a default by Corporation Q might have a materially negative impact on Corporation X's financial situation, which a credit default swap can prevent. Traditional fixed income asset managers represent a potentially large group of credit default swap users, both as protection buyers and as sellers, although actual usage among this group is still limited, most likely due to investment policy restrictions against the use of most or all types of derivatives.

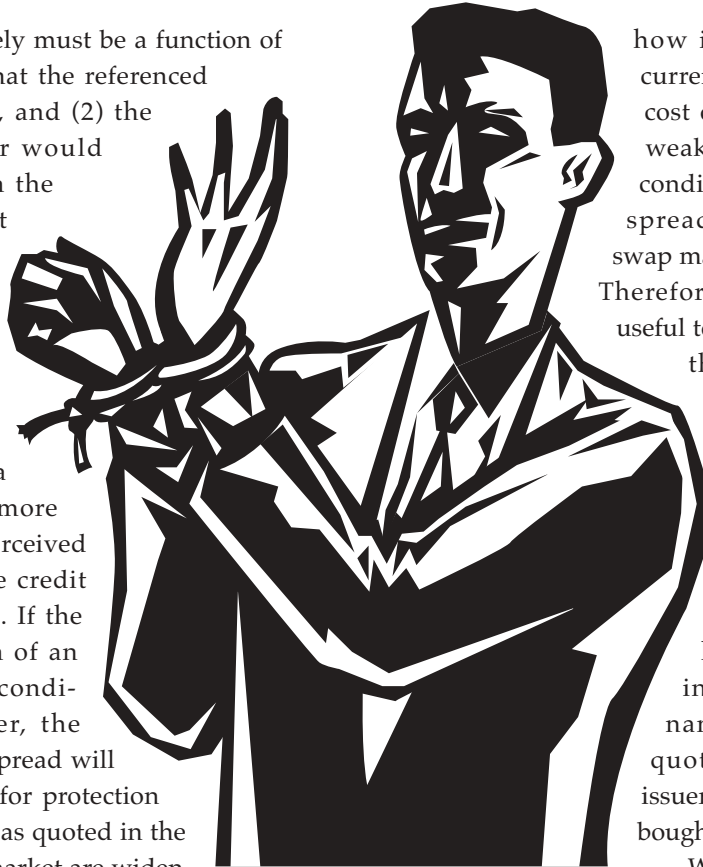
We now discuss how the cost of protection is determined. At the time a default swap is created, the present value of the payments made by the protection buyer must equal the expected value of the payment to be received from the protection

2) For more information about models of default probability, please see the CMS BondEdge research publication, "An Introduction to Credit Risk Modeling," available on the BondEdge Private Client Web site or by request at [www.cmsbondedge.com](http://www.cmsbondedge.com).

3) The default probability cannot be derived from default swap spreads without specifying a "recovery," or "loss given default" rate.

seller, which intuitively must be a function of (1) the probability that the referenced obligor will default, and (2) the amount an investor would expect to recover in the event a default occurs.<sup>2</sup> Therefore, quoted credit default swap spreads are indications of the market's view on the default probability for a given obligor.<sup>3</sup> The more likely a default is perceived to be, the higher the credit default swap spread. If the market's perception of an obligor's financial condition grows stronger, the credit default swap spread will tighten. So, if prices for protection on a particular name as quoted in the credit default swap market are widening significantly, this is an indicator of a change in perceived credit quality. The credit default swap market may respond more quickly than the cash market and therefore can be an important leading indicator of what spreads on the issuer's bonds are likely to do.

Having said that, it is important to note that while the credit default swap market is growing in breadth and liquidity, it is still a new market and therefore suffers from supply/ demand imbalances that can cause substantial and potentially misleading price volatility. In fact, price volatility in the credit default swap spread market may even be a self-fulfilling prophecy: Assume Obligor X is planning a new debt issue. The dealers in the underwriting syndicate buy protection in the default swap market as a hedge against spreads widening while the new issue is being marketed, which causes the default swap spread for Obligor X to widen. Bond investors observe the volatility in the price of credit protection for Obligor X and begin to sell their current holdings, which causes spreads on Obligor X's existing debt to widen. The coupon rate Obligor X must now pay to raise new funds therefore increases to keep up with



how its outstanding debt is currently trading. This higher cost of debt could potentially weaken Obligor X's financial condition, which would cause spreads in the credit default swap market to widen, and so on. Therefore, while it is extremely useful to monitor spread levels in the credit default swap market, the information derived should be used judiciously. Note also that default protection is not available on all corporate issuers, although some claim to have databases containing thousands of obligor names, daily prices are quoted only on a subset of issuers for whom protection is bought and sold regularly.

While the bulk of activity in the credit derivatives market consists of single-name, "vanilla" default swaps, there are variations that are worth noting. In particular, there are so-called "first to default" swaps, where protection is bought/sold on a "basket" of obligors and a payoff occurs when the first issuer in the basket defaults. The price of protection (the swap spread) for this kind of swap is not simply the sum of the cost of protection for the individual names in the basket, since the expected loss on the basket of names depends upon the default correlation among the issuers in the basket. While a discussion of default risk correlation is beyond the scope of this article, suffice it to say that there is no standard way of measuring default correlations and that the correlation assumptions used make a substantial impact on the valuation of a basket default swap.

The credit derivatives market is growing rapidly, and offers financial institutions new ways to manage credit risk. Like any new market, it will undoubtedly experience "growing pains" but promises to be an increasingly valuable tool and important source of information for all types of institutions with exposure to credit risk. ☺



*Ms. Geske is senior vice president at CMS BondEdge where she manages the research and design of enhancements to the BondEdge fixed income portfolio analytics system. This article was adapted from a series of articles on fixed income topics, available at [www.cmsbondedge.com](http://www.cmsbondedge.com). Comments may be directed to her at [teri.geske@be.ftid.com](mailto:teri.geske@be.ftid.com).*