

Credit Default Swaps (CDS) and their Role in the Credit Risk Market

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Abstract

The market for credit default swaps (CDS) has experienced explosive growth in the past. Credit default swaps have existed since the early 1990s and the market increased tremendously starting in 2003. By the end of 2007, the outstanding amount was \$62.2 trillion, falling to \$38.6 trillion by the end of 2008. The recent crisis has revealed several shortcomings in CDS market practices and structure. The purpose of this paper is to explore how the developments of the CDS market have played an important role in the credit risk markets. In particular, it is relevant to ascertain whether the CDS markets act as a leading price indicator, and hence, if CDS spreads provides a valuable market-based assessment of credit conditions.

Keywords: *credit derivatives; CDS; Credit risk; Credit spread; Counterpart risk; systemic risk.*

Field: Finance and economics

1. Introduction

The credit default swap is a simple derivative contract that has revolutionized the trading of credit risk. In its simplest form, a CDS is used to transfer the credit risk of a reference entity (corporate or sovereign) from one party to another. In a standard CDS contract one party purchases credit protection from another party, to cover the loss of the face value of an asset following a credit event. A credit event is a legally defined event that typically includes bankruptcy, failure-to-pay and restructuring. This protection lasts until some specified maturity date. To pay for this protection, the protection buyer makes a regular stream of payments, known as the premium leg, to the protection seller. CDS allow credit risks to be separated from the underlying credit relationship and to be traded separately. A broader distribution of credit risks improves the financial system’s overall ability to absorb shocks. Furthermore, CDS even allow for greater risk distribution in those sectors which cannot function as a direct creditor in credit operations. For many years, these instruments have been touted as an efficient means of distributing risk and promoting financial stability.

The use of credit default swaps has become increasingly popular over time. Between 2002 and 2007, gross notional amounts outstanding grew from below USD 2 trillion to nearly USD 60 trillion. By the end of 2007, the outstanding amount was \$62.2 trillion, falling to \$38.6 trillion by the end of 2008. The recent crisis has revealed several shortcomings in CDS market practices and structure.

The purpose of this paper is to explore how the development of the CDS market have played an important role in the credit risk markets. In particular, it is relevant to ascertain whether the CDS markets act as a leading price indicator, and hence, if CDS spreads provides a valuable market-based assessment of credit conditions.

The paper, *in the first step*, focuses on the functions of a credit default swap. Past problems should not distract from the potential benefits of these instruments. In particular, CDSs help complete markets, as they provide an effective means to hedge and trade credit risk. CDSs allow financial institutions to better manage their exposures, and investors benefit from an enhanced investment universe. CDS represent an important instrument for managing the risk-return profile of a portfolio. Although disentangling the various uses of CDSs is somewhat artificial, one approach has been to distinguish between CDSs for hedging and trading purposes. In the first category, CDSs can be used to hedge the credit risk of on-balance sheet assets (e.g. corporate bonds or asset-backed securities) by acquiring CDS protection on them. Such protection provides capital relief and insures the acquirer of protection against credit losses (assuming the terms of the CDS contract provide for perfect hedging). Commercial banks and other lenders are natural buyers of CDS protection for such purposes, while highly rated dealers, insurance companies, financial guarantors and credit derivative product companies were the typical protection sellers prior to the financial crisis. Derivatives can also be used as trading tools, for speculating or arbitrage purposes. Speculators and arbitragists add liquidity to the market by “connecting” markets and eliminating pricing inefficiencies between them. Instead of purchasing a specific bond, a market participant who considers certain credit risks to be overvalued can earn an attractive CDS premium as a protection seller in the CDS market. On the other hand, market participants who consider risks to be undervalued can purchase protection by paying a premium. Then, the paper describes the market for credit default swaps and how it evolved.

In the *second step*, this paper examines CDS as a potential source of important additional information, CDS spread as a measure of credit risk and as means of allocating risks more efficiently. CDS spreads provide a valuable market-based assessment of credit conditions. CDS have got an important function with regard to price discovery in the credit markets. CDS markets have price leadership over bond markets and act as a clear indicator of upcoming credit downgrades by rating agencies. In an ideal world, CDS spreads and risk premia in the bond market should show similar behavior due to the integration of both markets via the possibility of arbitrage. However, a number of factors weaken the price link between CDS and bond markets. These include liquidity restrictions, tax treatments, limited short-selling opportunities, callable bonds and an additional counterparty default risk in the case of CDS. Developments in the CDS markets may also increase the threat of systemic crises.

2 CDS as a risk management tool

Within an economy a broad variety of entities have a natural need to assume, reduce or manage credit exposures. These include banks, insurance companies, hedge funds, fund managers, corporate and government agencies. Each type of player will have different economic or regulatory motives for wishing to take positive or negative credit positions at particular times. In simple terms, credit derivatives are instruments that transfer part or all of

the credit risk of an obligation, without transferring the ownership of the underlying asset. Credit default swaps are the most important and widely used instruments in the credit derivatives market.

Conventional credit instruments (such as bonds or loans) do not offer the same degree of structural flexibility or range of applications as CDS¹. A fundamental structural characteristic of this product is that they de-couple credit risk from funding. Thus players can radically alter their credit risk exposures without actually buying or selling bonds or loans in the primary or secondary markets. CDS enable users to:

- hedge and/or diversify credit exposure. Credit default swaps are often used to manage the risk of default which arises from holding debt. A bank, for example, may hedge its risk that a borrower may default on a loan by entering into a CDS contract as the buyer of protection. If the loan goes into default, the proceeds from the CDS contract will cancel out the losses on the underlying debt². Another kind of hedge is against concentration risk. Financial economists have long noted the benefits of applying a portfolio approach to loans by means of diversification but practical considerations made diversification difficult to achieve. Relationship considerations, for example, posed an obstacle to diversifying by deliberately reducing exposure to major clients. Further, the statistical properties of credit risk—that is, non-normality of loss distributions and the resulting effect of specification errors in determining losses in the tail of the distributions— suggest that a truly diversified loan portfolio requires a significantly larger number of credits than would an equity or bond portfolio³. Buying protection by means of CDS provides solutions to both of the foregoing problems, A major benefit is that, in contrast to loan sales, CDS do not require consent of the reference entity, without impacting its loan portfolio or customer relations. Similarly, a bank selling a CDS can diversify its portfolio by gaining exposure to an industry in which the selling bank has no customer base⁴.

¹Cfr. Mengle D. (2007); Das (2005; 2006).

²The problem is that taking a short position in credit is not generally feasible Although selling a corporate bond is theoretically possible, many borrowers do not have liquid debt outstanding, so borrowing for a short sale is often not feasible. As a result, if a credit deteriorates, a lender can do little to protect itself prior to default other than taking collateral, which might not be effective in many distressed cases, or by selling the loan, which normally requires the consent of the borrower.

³ Smithson C. (2003).

⁴ A financial institution seeking to diversify its credit exposure might, for example, sell CDS protection as an alternative to making loans or buying bonds. This alternative is especially helpful to institutions that seek credit exposure but lack the legal infrastructure for lending; it is also helpful to banks seeking to diversify their loan portfolios but lacking direct relationships with desired credits. Further, selling protection allows an investor with a high cost of funding to take on credit exposure without incurring the cost of funding. It is important in such cases that the investor realizes that the exposure to losses is the same as if it were lending directly. The ability to sell protection also allows market participants to act on a view that a reference entity's credit quality will improve. In this case, the investor would sell protection now in the hope of unwinding it later by purchasing it at a lower price. As mentioned above, such activity adds liquidity to the market and increases the quality of price discovery.

- Speculate on credit exposure. Credit default swaps allow investors to speculate on changes in CDS spreads of single names or of market indices⁵. An investor might believe that an entity's CDS spreads are too high or too low, relative to the entity's bond yields, and attempt to profit from that view by entering into a trade, known as a basis trade, that combines a CDS with a cash bond and an interest-rate swap. Finally, an investor might speculate on an entity's credit quality, since generally CDS spreads will increase as credit-worthiness declines, and decline as credit-worthiness increases. The investor might therefore buy CDS protection on a company to speculate that it is about to default. Alternatively, the investor might sell protection if it thinks that the company's creditworthiness might improve. The investor selling the CDS is viewed as being "long" on the CDS and the credit, as if the investor owned the bond. In contrast, the investor who bought protection is "short" on the CDS and the underlying credit. Credit default swaps opened up important new avenues to speculators. Investors could go long on a bond without any upfront cost of buying a bond; all the investor need do was promise to pay in the event of default. Shorting a bond faced difficult practical problems, such that shorting was often not feasible; CDS made shorting credit possible and popular. Because the speculator in either case does not own the bond, its position is said to be a synthetic long or short position. Such speculative activity has the beneficial effect of adding liquidity to the market and of increasing the quality of price discovery⁶.
- synthetically create loan or bond substitutes for entities that have not issued in those markets at chosen maturities. CDS can be combined to create new financial instruments, to better satisfy the needs of the risk shedder and risk taker. Credit default swaps are also used to structure synthetic collateralized debt obligations (CDOs). Instead of owning bonds or loans, a synthetic CDO gets credit exposure to a portfolio of fixed income assets without owning those assets through the use of CDS. CDOs are viewed as complex and opaque financial instruments.
- decompose and separate risks embedded in securities (such as in convertible bond arbitrage). CDS allow participants to take advantage of arbitrage opportunities in the bond market since, in principle, a risky bond can be duplicated through a risk-free investment or a CDS contract taken out on a suitable reference debtor. As a rule, however, CDS trade is limited to liquid credit positions, which means that any operations in the CDS market are possible for only a limited number of debt securities.
- manage regulatory capital ratios.

Finally, through trading, the CDS market generally becomes more liquid, improving not only the chances of protection buyers and sellers finding a contract partner, but also enhancing pricing efficiency. On the other hand, it has been argued that excessive trading may distort the pricing mechanism and reverse causality by forcing corporate or sovereign borrowers to pay excessively high rates on their debt.

⁵ The buyer of credit risk protection does not necessarily need to be exposed to the underlying risk when entering into a CDS contract. CDS may also be used for pure trading purposes, where traders try to exploit possible mispricing between different asset classes or take open positions if they believe the market will evolve in a certain direction. Similarly, sellers of credit protection are able to gain access to the credit market via an arm's length financial transaction.

⁶ International Monetary Fund (2006).

3. Impact of CDS trade on credit risk markets

It is often argued that the flip side of wider and deeper risk transfer is that, instead of exerting a stabilizing influence on markets, it is potentially destabilizing because it transfers risk from participants that specialize in credit risk (that is, banks) to participants with less experience in managing credit risk. In addition, there is the danger that anything used to disperse risk can also be used by investors seeking yield enhancement to concentrate risk. These new institutions generally fall outside the regulatory reach of agencies that oversee various aspects of the credit markets⁷. Such arguments have weaknesses, however. While it is true that banks traditionally specialize in managing credit risk, for example, it is also true that traditional lending has tended to concentrate credit exposures in a narrow class of institutions, namely, commercial banks. Further, one could argue that nonbank institutions might in many cases have liability structures that are more suitable than those of banks for bearing credit risks⁸. But even if one were to accept the questionable argument that nonbank investors are inevitably less skilled than banks at managing credit risk, it would also be the case that credit losses would have less effect on any one institution than was the case when credit was limited mostly to banks. Finally, the argument that CDS increase overall risks by transferring credit risk outside strictly regulated institutions makes an implicit assumption that government regulation automatically leads to more prudent risk-taking. But this argument ignores the potential moral hazard associated with such an assumption. Indeed, because less regulated institutions are less likely to be protected by an official safety net, such institutions are likely to have substantial incentives to identify, measure, and manage credit exposures. Another commonly cited drawback of CDS is that they reduce incentives for lenders to analyze and monitor credit quality because they now have the ability to off-load credit risk. The result is a decrease in overall credit quality. Again, there are weaknesses to such arguments, mainly that hedging is not costless. As is true with other risks, when one hedges away a risk, one also hedges away the opportunity to profit. A possible exception to this rule would be systematic under pricing of CDS protection relative to loan risk, for which no evidence exists. Another possible exception is a “lemons” argument that lenders use collateralized debt obligations to off-load risks to protection sellers, although one would expect that such a practice, if widespread, would induce CDO note buyers to build expectations of higher losses into the price of the credit protection they provide. Yet another exception would be lenders’ possessing inside information about credit quality, on which they could act by buying underpriced protection. This issue has already received extensive attention by the financial industry, however, and one would not expect such activity to be a systematic feature of CDS markets. A corollary to the argument that lenders with access to credit protection are indifferent to risk is that credit derivatives, as do other forms of risk transfer, inevitably involve a moral hazard effect that leads to higher risk overall. In other words, risk reduction at the individual entity level can mean higher risk at the system level. Such an argument has an element of plausibility in that, when market participants are able to hedge certain risks, they are able to increase the amount of risks they take overall. But even if firms do take on more risk than before, one could argue that, as long as firms do not

⁷Cfr. Mengle D. (2007).

⁸ International Monetary Fund (2006).

take on excessive amounts of risk, the system is in fact safer because the individual institutions that hedge are less vulnerable to market shocks.

Another benefit of credit derivatives is that they add transparency to credit markets⁹. Prior to the existence of credit derivatives, determining a price for credit risk was difficult, and no accepted benchmark existed for credit risk. As credit derivatives become more liquid and cover a wider range of entities, however, lenders and investors will be able to compare pricing of cash instruments such as bonds and loans with credit derivatives. Further, investors will be able to engage in relative value trades between markets, which will lead to further improvements in efficiency and price discovery. At a higher level, economic stability stands to benefit from the ability to transfer credit risk by buying and selling protection. As with other derivatives, the cost of risk transfer is reduced, so risk is dispersed more widely into deeper markets.

During the crisis of 2007-2009 it became clear that the mere existence of a CDS market was not a sufficient condition for achieving a more stable financial system. There are several reasons for this¹⁰. First, CDSs may have contributed to an alignment of risk profiles across financial institutions, thereby increasing the institutions' vulnerability to common (systemic) shocks. Second, credit risks may have piled up in certain parts of the financial system, that did not have adequate organizational or financial capacities to deal with those risks. Finally, by increasing counterparty risk, while at the same time leaving market participants largely uniformed about this risk, CDSs may have constituted a further channel for spill-over effects possibly adding to the system's vulnerability. As the crisis demonstrated, the full benefits of enhanced risk diversification cannot be reaped until the deficiencies mentioned have been rectified. Current regulatory and industry initiatives thus try to establish the means necessary to minimize possible externalities of the CDS market.

3.1 The correlation between CDS and bond spreads

A non-distorted reflection of debtor-specific information in CDS spreads is of importance to both market participants and to overall financial stability. With a view to financial stability it is important to have as wide as possible a range of indicators which deliver reliable early warning signals of any looming risks. CDS markets may exhibit different pricing behavior from that of conventional financial markets. CDS can therefore be a potential source of important additional information.

The reliability of CDS spreads as an indicator for conducting a stability analysis depends to a large degree on how closely they are linked to default probabilities and to what extent they are appropriate to identify changes in debtors' creditworthiness. Comparing the price of the CDS with the bond spread (ie the excess return above the interbank rate), the investor can see how the market for credit default swaps to consider issuer's risk. If the premium is higher than the CDS spreads, the bond was little convenient and vice versa. So the greater the differential, the greater the relative attractiveness of the bond (See Table 2).

⁹ Kroszner R. (2007).

¹⁰ See Deutsche Bank Research (2009).

Table 2: CDS and bond spreads.

ISSUER	YIELD BOND (5 Y) (a)	INTERBANK RATE (5 Y) (b)	PREMIUM CDS (5Y) (c)	(a)– (b) – (c)
<i>Italease bank</i>	5,17%	2,73%	2,18%	0,27%
<i>Banca Intesa</i>	3,40%	2,73%	0,50%	0,17%
<i>Unicredit</i>	3,36%	2,73%	0,85%	-0,22%
<i>Generali</i>	3,38%	2,73%	0,60%	0,05%
<i>Mediobanca</i>	3,04%	2,73%	0,55%	-0,24%
<i>Bnl</i>	3,48%	2,73%	0,52%	0,24%

Source: JC&Associati (2009)

Based on the arbitrage-related integration of both markets, CDS prices and bond risk premia should actually be closely linked. Given risk premia from bond yields, little should be learned from CDS spreads. In practice though, the two indicators reveal significant differences for various reasons¹¹. First, bond yields are influenced by many other factors apart from credit risk, notably interest rate risk and liquidity risk, which require distinct assumptions before their implied probabilities of default can be extracted. Likewise, CDS spreads do not easily translate into default probabilities, due to uncertainties concerning recovery values, counterparty risk or the pricing of specific contractual details. Moreover, CDSs allow credit risk to be separated from interest rate risk, thereby excluding one source of uncertainty in the underlying pricing mechanism.

One of the most peculiar aspects of the crisis of 2008 it was the huge difference between the cost of CDS and the yield spread of bonds that actually represent the same risk (ie the failure of an issuer), should take very similar values. As the chart below, however, the difference between the cost of CDS and the spreads of bonds (called CDS basis) has become heavily negative values. So in practice, while the yield increased, indicating a high risk of insolvency, the cost of CDS increased, in fact, much less (Chart 6).

¹¹ See Deutsche Bank Research (2009).

Chart 6: CDS basis



Source: JC&Associati (2009)

According to a study conducted by Zhu¹², the available liquidity in the CDS and bond markets plays a major role in explaining existing price differences in both markets. In the corporate bond market, many participants hold their securities until maturity. Liquidity in the secondary markets is too low to permit extensive dealing in major credit risks at relatively low transaction costs.

To conclude, CDS and bond spreads provide for two complementary sources of information. A number of studies conclude that on balance CDS spreads display the more favorable characteristics as a market indicator of distress. Based on rigorous empirical analysis, these studies find that CDS spreads tend to lead the signals derived from bond markets¹³. For riskier credit, CDSs seem to be more liquid than their underlying reference entities, as indicated by lower bid-ask spreads in the CDS market. In addition, the evidence suggests that CDS trading tends to continue during periods of distress, in times when liquidity in bond markets may be severely restricted¹⁴. Due to their favorable characteristics, CDS spreads have gained widespread acceptance as an important indicator of distress. Other examples include the prices charged for government guarantees for debt issues of banks hit by the financial crisis or the rates demanded for corporate credit lines, both of which have been directly linked to CDS spreads. Likewise, rating agencies use information derived from CDS prices to calculate “market implied ratings”. Thus in practice, CDS spreads serve as an important source of information for private banks, central banks, supervisors and international organizations alike.

¹²Zhu H. (2004).

¹³ See Blanco, Brennan and Marsh (2005) find that price discovery takes place primarily in the CDS market. Hull, Predescu and White (2004) find that the derivatives market tends to anticipate future rating events, with either credit spread changes or credit spread levels providing helpful information in estimating the probability of negative credit rating changes. Zhu (2006) suggests that in the long run credit risks are equally priced between the two markets. Yet in the short run, the derivatives market tends to lead the cash market. Alexopoulou (2009) obtain similar results.

¹⁴See Kiff et al. (2009).

4. Conclusions

The recent crisis has revealed several shortcomings in CDS market practices and structure. Past problems should not distract from the potential benefits of these instruments. In particular, CDSs help complete markets, as they provide an effective means to hedge and trade credit risk. CDSs allow financial institutions to better manage their exposures, and investors benefit from an enhanced investment universe. In addition, CDS spreads provide a valuable market-based assessment of credit conditions.

To conclude, ongoing monitoring of the credit risk transfer market is indispensable for gaining new insights into the stability of the financial markets. CDSs are not only risk management tools for banks but also contribute to the completeness of the market, by providing market participants with a possibility to take a view on the default risk of a reference entity, on a company or a sovereign borrower. Thereby and as shown during the crisis, derivatives allow for pricing of risk that might otherwise be difficult due to lack of liquidity in the underlying assets.

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