

Credit default swaps

Financial innovation or financial dysfunction?

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CDS contracts were originally designed to transfer and disperse default risk within the capital markets to strengthen the resilience of financial institutions. The Global Financial Crisis has revealed that CDS contracts may not in fact achieve these objectives and may in fact increase the leverage within the system and also increase systemic risks in other ways. Documentary complexity, counterparty risk and increased concentration risk, brought about by CDS contracts, have contributed to the crisis and made it difficult to deal with key issues. CDS contracts may be presented as an important financial innovation, but actually are a major financial dysfunction and a cause of risk within financial system under certain circumstances.

Credit default swap (CDS) contracts and credit derivatives are complex and powerful financial instruments that frequently have unforeseen consequences for market participants and the financial system. As former New York Federal Reserve President Gerald Corrigan told policy-makers and financiers on 16 May, 2007: "Anyone who thinks they understand this stuff is living in lala land."

1| THE PROTECTION RACKET¹

In a typical CDS contract, the buyer of protection transfers the risk of default of a borrower (the reference entity) to a protection seller who for a fee indemnifies the protection buyer against credit losses. The buyer of protection is hedging the risk of default of the reference entity while the seller of protection is assuming the risk of default of the reference entity.

For the buyer of protection, the CDS contract avoids the need to transfer loans or bonds to hedge the credit risk of the issuer or borrower. This may be useful for illiquid bonds and especially loans, where it may be difficult to transfer the debt without the consent of the borrower. It allows disaggregation of key elements in hedging credit risk such as timing of the hedge, maturity of the hedge, currency in which the hedge is transacted and the pricing of the hedge. This increases flexibility in hedging credit risk. The documentation for CDS contracts is less expensive and less complicated relative to that needed for selling or transferring a loan. The transfer of the risk of a loan can be completed without disclosure to the ultimate borrower. This is possible as the loan is not sold or transferred but hedged through the separate CDS transaction.

For the seller of protection, the CDS contracts allows entities other than traditional financial institutions with lack of credit origination infrastructure to participate relatively easily in the credit market. The CDS contract, being off-balance sheet and unfunded, allows a seller of protection to take positions in credit markets on a leveraged basis; that is, without investing the full face value of the loan or bond.

The CDS contract facilitates short selling credit risk. This overcomes structural issues, such as the illiquid nature of the corporate bond repo market, that make it difficult, in practice, to short sell credit risk. The volume of CDS contracts is also unconstrained by the available amount of the reference entity's outstanding bonds and loans potentially increasing the overall liquidity of credit markets.

The CDS contract and the entire structured credit market were predicated originally on *hedging of credit risk*. Over time, the market has changed focus – in Mae West's words: "I used to be Snow White, but I drifted." The ability to short credit, leverage positions, and trade credit unrestricted by the size of the underlying debt market have become the dominant drivers of growth in the market for these instruments. At the market peak in volume around 2007, CDS volumes were estimated to be roughly three to four times volumes of underlying bonds or loans. This reflects increased interest amongst investors, such as hedge funds, in trading credit risk.

2| OUNCES OF PERFORMANCE

Where banks use CDS contracts to hedge credit risk, the key issue is whether the contract protects the banks from the underlying credit risk being hedged. As Mae West also noted: "An ounce of performance is worth pounds of promises". Documentation and counterparty risk means that the market may not function as participants and regulators hope if actual defaults occur.

Over time, CDS documentation has become highly standardised to facilitate trading. It generally does not exactly match the terms of the underlying credit risk (for example, the bond or loan) being hedged. A CDS contract is only likely to be a close hedge to another position in an offsetting CDS contract.

CDS contracts are also technically complex in relation to the identity of the entity being hedged, the events that are covered and how the CDS contract is to be settled. This means that the hedge may not provide, in practice, the protection sought. In fairness, all financial hedges display some degree of mismatch or "basis" risk.²

¹ For a more technical treatment of CDS contracts see Satyajit Das (2005).

² For a discussion of documentary issues in CDS contracts see Satyajit Das (2008 and 2009).

In 2009, the International Swap Dealers Association (ISDA), the industry lobby group with little regulatory or legal status, implemented the "hardwire" of the CDS contract, creating a Credit Determinations Committee (CDC) to deal with some of these issues. The CDC, made up of ISDA members, primarily dealers but now also including investors and other market participants, is charged with "determining" whether a credit event has occurred or a successor event has taken place and establishing the framework for settling contracts.

This curious development has real world consequences. In 2010, ISDA's American CDC voted that a bankruptcy credit event had occurred in respect of Ambac Assurance Corporation, which provided financial guarantee insurance for public and structured finance obligations. Interestingly, Ambac Assurance had not actually filed for bankruptcy protection. The insurer was seeking to restructure its operation. The credit event was classed as a 'bankruptcy' credit event, rather than alternatives such as 'restructuring' or 'failure to pay' due to complex provision of the CDS governing documentation. The case highlights the complexity and (sometimes) unintended consequences of CDS documentation, which moreover are poorly understood.

At the quantum level, the laws of classical physics bend in intriguing ways. In the case of CDS contracts, at the derivative level, the rules of finance also operate differently.

3 | WHO'S HEDGING WHOM?

CDS contracts substitute the risk of the protection seller for the risk of the loan or bond being hedged. If the seller of protection is unable to perform then the buyer obtains no protection.

In many cases, the CDS is marked-to-market daily and any gain or loss is covered by collateral (cash or high quality securities) to minimise performance risk. If there is a failure to meet a margin call then the position must be closed out and the collateral applied against the loss.

AIG's CDS contract were subject to the provision that if the firm was downgraded below AA- then the firm would have to post collateral. In October 2008, when AIG was downgraded below the nominated threshold, this triggered a collateral call rumoured to be around USD 14 billion. AIG did not have the cash to meet this call and ultimately required government support.

Current derivative market reform proposals requires standardised derivative transactions, including CDS contracts, to be cleared through the central counterparty (CCP). The CCP guarantees performance and manages the credit risk of derivative transactions. However, there are reasons to be cautious about the efficacy of the CCP.

The CCP risk management process requires liquid markets and reliable market prices that may not be available. Few derivatives will be capable of being marked-to-market against *actual* prices. For CDS contracts, it may be mark-to-model based on inputs that may be validated from market prices. For less traded reference entities, it will be a case of *mark-to-make-believe* or *mark-to-myself*. One market participant described quotes for CDS contracts in the following terms: "The business looks like the window of a Brezhnev-era Soviet butcher shop. Mouldy scraps hanging in the window. Old women lining up at 4am to try and buy credit protection on General Motors. What are reported as trades are really ways to establish prices to satisfy the auditors."³

CCP risk management relies on establishing a level of initial margin to secure performance. Margins will be based on historical price movements using value-at-risk and stress models that performed poorly during recent times. For CDS contracts that are triggered by defaults, unexpected and rapid deterioration in the credit condition of an entity can trigger large changes in value – known as "jump to default" risk. Such rapid changes in value are difficult to model and capture in risk management systems. If initial margins are too low, then the CCP is inadequately protected against counterparty default. Alternatively, the initial margin may be set too high creating disincentives for legitimate risk management activity.

3 See John Dizard (2008).

Where a margin payment is not met, the mechanics of closeout assume the ability to replace the defaulted contract with a new counterparty at current market prices in an active and liquid market. In the aftermath of the Lehman Brothers' bankruptcy filing, market liquidity diminished sharply and price volatility increased. It was practically difficult to replace CDS contracts. Market prices and valuations were significantly different from model valuations. It is not clear how these risks will be managed by the CCP.

In its December 2009 report "Reforming OTC derivative markets: a UK perspective", the UK Financial Services Authority (FSA) did not support *mandatory* clearing because "the clearing of all standardised derivatives could lead to a situation where a ...CCP... is required to clear a product it is not able to risk manage adequately, with the potential for serious difficulties in the event of a default."

4| FINANCIAL DYSFUNCTION

Financial innovation can offer economic benefits. CDS contracts may help complete markets, enhancing investment and borrowing opportunities, reducing transaction costs and allowing risk transfer. CDS contracts, where used for hedging, offers these advantages. Where not used for hedging, it is not clear how this assists in capital formation and enhancing efficiency of markets.

In providing the ability to transfer risk, CDS contracts may in turn encourage moral hazard in institutions encouraging them to take on more risk on the assumption that the additional risk will be transferred or hedged. It exposes firms to significant risk of losses from a breakdown in markets and also where the hedges do not work as intended due to either problems in the design of the hedge or counterparty risk.

It is generally assumed that speculative interest assists in enhancing liquidity and lowers trading costs. Where the liquidity comes from leveraged investors, the additional systemic risk from the activity of these entities has to be balanced against potential benefits.

Pricing of CDS contracts frequently does not accord with reasonable expected risk of default. The CDS prices,

in practice, incorporate substantial liquidity premia, compensation for volatility of credit spreads and other factors. CDS pricing also frequently does not align with pricing of other traded credit instruments such as bonds or loans.

The "negative basis trade" is predicated on pricing *inefficiency*. In a negative basis transaction commonly undertaken by investors including insurance companies, the investor purchases a bond issued by the reference entity and hedges the credit risk by buying protection on the issuer using a CDS contract. The transaction is designed to lock in a positive margin between the earnings on the bond and CDS fees. Negative basis trades exploit market inefficiencies in the pricing of credit risk between bond and CDS markets.

Benefits of CDS contracts must be balanced against any additional systemic risks from trading in these instruments. CDS contracts may amplify losses through leverage and increase credit risk within the financial system as well as change the risk of bankruptcy and affect the level of recoveries.

5| SEND ME A CHILD OF FIVE!

Discussions of "losses" always lead to arguments that approximate Groucho Marx: "A child of five would understand this. Send someone to fetch a child of five."

The derivative industry's indefatigable support of the market centres on the fact that all the CDS contracts related to the high profile defaults in the global financial crisis settled and the overall net settlement amounts were small.

Closer scrutiny suggests caution. In practice, until the implementation of the "hardwire" in 2009 there are actually two settlements. The "real" settlement where genuine hedgers and investors deliver bonds under the physical settlement rules (i.e. those who actually own bonds or loans and were hedging). Then there is the parallel universe where the dealers and large hedge funds settled via the auction. Dealers tend to have small net positions (large sold and bought protection but overall reasonably matched).

In the case of Lehman Brothers, the net settlement figure of USD 6 billion that is frequently quoted

refers to the second process. Real CDS losses from Lehman CDSs were higher, probably around USD 300-400 billion. Some banks and investors that had sold protection on Lehman's did not participate in the auction. They chose to take delivery of defaulted Lehman debt resulting in losses of almost the entire face value. For example, one German Landesbank reportedly took delivery of USD 1 billion of Lehman bonds that were worth USD 30 million at current market values.

CDS contracts did, in all probability, amplify losses in the credit market in recent defaults. For example, when Lehman Brothers defaulted the firm had around USD 600 billion in debt. This would have been the maximum loss to creditors in the case of default. According to market estimates, there were CDS contracts of around USD 400-500 billion where Lehman's was the reference entity. If used for hedging, then the CDS contracts would merely have resulted in the losses to creditors being transferred to the sellers of protection leaving the total loss unchanged. Market estimates suggest that only around USD 150 billion of the CDS contracts were hedges. The remaining USD 250-350 billion of CDS contracts were not hedging underlying debt. The losses on these CDS contracts (in excess of USD 200-300 billion) are additional to the USD 600 billion.

Proponents of CDS contracts argue that losses on additional "speculative" positions on Lehman as a reference entity are not a loss *per se*; that is, there are no "real" losses. Instead, the argument goes that they represent a transfer of payments from one counterparty to another – from the seller of protection to the buyer of protection. The idea is evident in a short essay by Michel de Montaigne entitled "That one man's profit is another's loss". Interestingly, if you follow that logic with Lehman's debt then nobody actually lost money either because somebody somewhere must have made it on the other side. Indeed, there have been *no losses* at all during the entire Global Financial Crisis as someone somewhere has made the offsetting gain.

The true issue is subtler – the CDS contracts amplified the losses as a result of the bankruptcy of Lehman's by (up to) approximately 50%. It increases the embedded leverage in the financial system to

a specific event namely the default of the reference entity. It also may absorb available liquidity and capital creating systemic issues.

6 | CHAIN LETTERS

The CDS market entails complex chains of risk similar to the re-insurance chains that proved so problematic in the case of the Lloyds market. The transfer of risk assumes that all parties along the potential chain perform their contracts. Any failure in the chain of risk transfer exposes other parties to the risk of insolvency and default. Defaults and failures in CDS contracts may quickly cause the financial system to become "gridlocked" as uncertainty about counterparty risks restricts normal trading. The bankruptcy of Lehman's set off a chain of just these events causing financial markets to become "frozen" in September and October 2008.

As in the re-insurance market, the long chain of CDS contracts may create unknown concentration risks. Derivatives markets generally may have higher concentration risk than considered desirable or acceptable. The CDS market is similar in structure to the overall derivative market with less than 10 dealers having the major share of the market. The potential impact of a bankruptcy filing by Bear Stearns and AIG on the OTC derivatives market, including CDS contracts, was probably one of the factors that influenced the Federal Reserve and US Treasury's decision to support the rescue of the two firms.

If the CDS contracts fail then "hedged" banks are exposed to losses on the underlying credit risk. One analyst suggested that losses from failure of CDS protection sellers to perform could total between USD 33 billion and USD 158 billion.⁴ Barclays Capital estimated that the failure of a dealer with USD 2 trillion in CDS contracts outstanding could potentially lead to losses of between USD 36 billion and USD 47 billion for counterparties. This underlines the potential concentration risks that are present.

CDS contracts may under certain circumstances create volatility and uncertainty instead of reducing

⁴ See Andrea Cicioni (2008).

risk. For example, the coupling of participants and long chains of risk transfer may mean that uncertainty about the financial position or solvency of any firm is quickly transmitted throughout the financial system rather than being confined to firms directly exposed to the distressed entity. Attempts to hedge this risk or close out positions may increase volatility. There are also negative feedback loops. If reference entities start to default then insurers, hedge funds and banks are affected. If the economic climate worsens and defaults rise then the overall ability to rely on these hedges may decline. The extent of the diversification of risk may diminish exactly when it is most needed.

7 | WAS IT GOOD FOR YOU TOO?

The documentation of CDS contract may also increase the risk of bankruptcy and impede debt restructuring that would limit losses from financial distress.

In 2008, CDS contracts on Federal National Mortgage Association (FNMA or Fannie Mae) and the Federal Home Loan Mortgage Corporation (FHLMC or Freddie Mac) were triggered as a result of the "conservatorship". This may seem odd given the government actions were specifically designed to allow Fannie and Freddie to continue fully honouring their obligations. However, "conservatorship" is specifically included within the definition of "bankruptcy" in the CDS contract resulting in a "technical" triggering of the contracts. This necessitated settlement of around USD 500 billion in CDS contracts with losses totaling USD 25 to USD 40 billion. The triggering of these contracts poses questions on the effectiveness of CDS contracts in transferring risk of default.

A study by Henry Hu and Bernard Black (from the University of Texas) identified the "empty creditor syndrome".⁵ This is where a lender who has bought protection on an underlying loan, bond or credit exposure may have an incentive to put the reference entity into bankruptcy or Chapter 11 *in order to be able to settle the contract*. This may be necessary as

the only way to trigger the CDS and capture the value of the credit insurance purchased.

CDS contracts might create incentives for creditors to push troubled companies into bankruptcy rather than seek to restructure debt to preserve the value of underlying assets. This may exacerbate losses in case of defaults. In fairness, ISDA's research challenges the "empty creditor syndrome" on both theoretical and empirical grounds.⁶

At a minimum, the CDS market may complicate restructuring of distressed loans, as all lenders do not have the same interest in ensuring the survival of the firm. A lender with purchased protection may seek to use the restructuring to trigger its CDS contracts.

CDS traders influenced the financing or restructuring of VNU, the multinational media business, GUS, the UK retail group, and Cablecom, a Dutch communications company. In February 2009, the US unit of LyondellBasell, the world's third-largest petrochemicals group that is in Chapter 11, secured a temporary restraining order and preliminary injunction against a group of creditors looking to enforce claims in a bid to trigger protection payments under their CDS contracts.

Conversely, the restructuring of MBIA avoided triggering CDS contracts on the firm through the use of reinsurance. The MBIA restructuring entailed the US municipal underwriting book being reinsured by a new entity – National Public Finance Guarantee Corporation (NPFGC). Reinsurance arrangements with Financial Guaranty Insurance Company (FGIC) were then ceded to NPFGC. NPFGC also issued second-to-pay policies to all policyholders covered by the assignment giving the beneficiaries a direct claim on the new entity and benefit from the credit quality of the new entity (that may be superior to the pre-existing MBIA). All other business of MBIA including structured finance exposures remains with MBIA.

The arrangements were designed in part to avoid triggering the CDS contracts under the "restructuring" credit event. They were also designed to avoid the succession provisions in the CDS contract that would have required existing CDS contracts where MBIA

⁵ See Henry T.C. Hu and Bernard Black (2008).

⁶ See David Mengle (2009).

was a reference entity to be split between MBIA and NPFGC. The effectiveness of the arrangements in not triggering the CDS contracts relies on highly technical readings of the contract.

The economic result of the arrangements is that MBIA retains the troubled structured finance exposures while losing the profitable and arguably less risky municipal re-insurance business. MBIA also reduces significantly the amount of capital it has available to support the exposures that remain with the firm.

MBIA was subsequently downgraded to non-investment grade. The downgrade reflected a reduction in MBIA's claim paying capacity, reduced capital, transfer of reserves associated with cession of its municipal portfolio and the continued deterioration in the insured portfolio of structured credit assets. This may materially increase the risk to sellers of protection in CDS contracts on MBIA.

The technical nature of the arrangements highlights the potential legal issues present in CDS contracts. Different legal forms of economically similar actions can lead to entirely different outcomes under the CDS contract complicating significantly the effects of the contract and its efficacy as a hedge.

8 | OBSERVING PROTOCOLS

In 2009, the CDS "big bang" and "hardwiring" process codified cash settlement of CDS contracts in case of a credit event. In cash settlement, the seller makes a payment to the buyer of protection intended to cover the loss suffered by the protection buyer based on the market price of a specific defaulted bond established through an "auction" system. The auction was designed by ISDA to be "robust" and "free of the risk of manipulation". The following highlights some of the issues in respect of the protocol and auction mechanism.

In Delphi, the protocol resulted in a settlement price of 63.38% (the market estimate of recovery by the lender). The protection buyer received 36.62% (100%-63.38%) or USD 3.662 million per USD 10 million CDS contract. Fitch Ratings assigned

a R6 recovery rating to Delphi's senior unsecured obligation equating to a 0-10% recovery band - far below the price established through the protocol.⁷ The buyer of protection depending on what was being hedged may have potentially received a payment on its hedge well below its actual losses - effectively it would not have been fully hedged.

Other cases highlight some of the issues in respect of the protocol and auction mechanism. The auction prices (effectively the recovery rates of the relevant bonds) in the settlement of CDSs on Fannie and Freddie were as follows:

- Fannie Mae – around 91.51% for senior debt and 99.90% for subordinated debt;
- Freddie Mac – around 94.00% for senior debt and 98.00% for subordinated debt.

Holders of subordinated debt rank behind senior debt holders and would generally be expected to suffer larger losses in bankruptcy. The lower payout on the subordinated debt probably resulted from subordinated protection buyers suffering in a short squeeze resulting in their contracts expiring virtually worthless. The differences in the payouts between the two entities are also puzzling given the fact that they are both under identical "conservatorship" arrangements and the ultimate risk in both cases is the US government.

In other CDS settlements using the auction, the payouts required from sellers of protection have been highly variable and (sometimes) large relative to historical default loss statistics. This may reflect poor economic conditions in the wake of the global financial crisis but are more likely driven by technical issues related to the CDS market.

Skewed payouts do not assist confidence in CDS contracts as a mechanism for hedging. In addition, the large payouts may place a material pressure on the price of underlying bonds and loans exacerbating broader credit problems. For example, the relatively low loan CDS recovery rates around 20-30% (high payouts on the loan CDS) may also lead to further pressures on leveraged loan prices and on transactions, such as collateralised loan obligations (CLOs) based on them.

⁷ See James Batterman and Eric Rosenthal (2005).

9 | POST MODERN CONTRADICTIONS

In recent years, the ability to trade credit, create different types of credit risk to trade, the ability to short credit and also take highly leveraged credit bets has become increasingly important. To some extent the CDS market has detached from the underlying "real" credit market. If defaults rise then the high leverage, inherent complexity and potential loss of liquidity of CDS contracts and structures based on them may cause problems.

The excesses of the CDS market are evident in the recent interest in contracts protecting against the default of a sovereign (known as sovereign CDSs). The specter of banks, some of whom have needed capital injections and liquidity support from governments to ensure their own survival, offering to insure other market participants against the risk of default of sovereign government (sometimes their own) is surreal.

The unpalatable reality that very few, self interested industry participants are prepared to admit is that much of what passed for financial innovation was specifically designed to conceal risk, obfuscate investors and reduce transparency. The process was entirely deliberate. Efficiency and transparency are not consistent with the high profit margins that are much sought after on Wall Street. Financial products need to be opaque and priced inefficiently to produce excessive profits or economic rents. Traders share Walter Bagehot's views about the English monarchy: "We must not let daylight in upon the magic".

In May 2006, Alan Greenspan, the former Chairman of the Fed, noted: "The CDS is probably

the most important instrument in finance. ... What CDS did is lay-off all the risk of highly leveraged institutions – and that's what banks are, highly leveraged – on stable American and international institutions." In October 2008, Alan Greenspan, the former Chairman of the Fed, acknowledged he was "partially" wrong to oppose regulation of CDSs. "Credit default swaps, I think, have serious problems associated with them," he admitted to a Congressional hearing. This from the man who on 30 July 1998, stated that: "Regulation of derivatives transactions that are privately negotiated by professionals is unnecessary."

On 6 March 2009 Bloomberg reported that Myron Scholes, the Nobel prize winning co-creator of the eponymous Black-Scholes-Merton option pricing model, observed that the derivative markets have stopped functioning and are creating problems in resolving the global financial crisis. Scholes was quoted as saying that: " [The] solution is really to blow up or burn the OTC market, the CDSs and swaps and structured products, and ... start over..." ISDA, the beleaguered derivatives industry group, predictably countered limply that: "... the notion that you would, as he said, blow up, the business in that way is just misguided."

Ludwig von Mises, the Austrian economist from the early part of the twentieth century, once noted: "It may be expedient for a man to heat the stove with his furniture; but he should not delude himself by believing that he has discovered a wonderful new method of heating his premises". In a thoroughly post-modern contradiction, CDS contracts, originally intended to reduce risk, may have, in fact, increased risk.

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