Let's Make It Clear:
How Central Counterparties Save(d) the Day*

BY CYRIL MONNET

The bankruptcy of Lehman Brothers in 2008 will certainly be featured in history books as one of the greatest financial failures so far, but it will also be recorded as yet another episode of the historically successful performance of clearing arrangements in ensuring the resiliency of markets. Recognizing the usefulness of safe and sound clearing and settlement procedures, the Federal Reserve has recently supported the attempt to shift the clearing of some contracts to a central counterparty. In this article, Cyril Monnet outlines the arguments in favor of central counterparty clearing, the economic rationale for trade clearing through a central counterparty, and some possible limits to the advantages of clearing trades through a central counterparty.

Following the bankruptcy of Lehman Brothers in September 2008, market participants were worried that Lehman's positions of more than $500 billion would take ages to unwind. Lehman's creditors did not know whether they would be able to recover all of the funds from their positions with Lehman or whether they would have to write them down. The uncertainty surrounding the unwinding process put the market in a frenzy. However, the unwinding of Lehman's positions was concluded in the following month. In doing so, the major clearinghouses, LCH.Clearnet in the UK and DTCC in the U.S., restored some market confidence in only a few days, after their actions made it clear that unwinding Lehman's position would be a smooth process.

Lehman's bankruptcy will certainly be featured in history books as one of the greatest financial failures so far, but it will also be recorded as yet another episode of the historically successful performance of clearing arrangements in ensuring the resiliency of markets. Clearing and settlement systems had previously come under severe stress during the stock market crash of 1987. However, as Ben Bernanke noted about that particular crisis, before he was appointed Chairman of the Federal Reserve, clearing and settlement systems, with the help of the Federal Reserve, played a pivotal role in easing liquidity conditions.[1]

Recognizing the usefulness of safe and sound clearing and settlement procedures, the Federal Reserve has recently supported the attempt to shift the clearing of some contracts, such as credit default swap contracts,[2] to a central counterparty. In October 2008, the Federal Reserve Bank of New York stated that setting up a central counterparty for credit default swaps was one of its priorities for addressing both operational and market design concerns for over-the-counter (OTC) derivatives.[3]

To make sense of this policy, we need to understand the arguments in favor of central counterparty clearing. What is the economic rationale for

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*The views expressed here are those of the author and do not necessarily represent the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

[1] In the 2008 crisis, the Fed also played a crucial role by taking on the credit default swaps of the insurer AIG. We can only speculate on the outcome, had the Fed allowed AIG to default on its obligations.

[2] A credit default swap (CDS) is an insurance contract whereby the buyer receives insurance on a credit instrument's failure to pay — for example, a bond or loan — in exchange for a series of payments to the seller.

[3] See New York Fed, 2008.

introducing trade clearing through a central counterparty? How did market participants come to use central counterparty clearing in the first place? And are there limits to the advantages of clearing trades through a central counterparty?

THE CLEARING AND SETTLEMENT SYSTEM

In the 1987 movie "Wall Street," the opening scene shows the trading room of an investment bank, and the brokers are scrambling for trades. Many of the brokers are shouting about hot leads and talking on the phone to clients, advising them to dump or buy certain stocks. The scene, which shows both the chaos and drama of the trading room, underlines this aspect of Wall Street: Brokers can make a fortune by just taking a few hundredths of cents for each trade they conduct.

But what happens once the brokers hang up the phone? Then it is time for the much less glamorous world of clearing and settlement, also known as the back office. And a central counterparty (CCP) is one piece of the larger clearing and settlement puzzle. (See the *Glossary of Terms* for definitions of some of the terminology used in this article.)

To understand where clearing, settlement, and CCPs fit into the trading process, I will now take you through the different stages of a typical trade. A series of figures will accompany my explanation. For simplicity, consider an example with three traders: Ace (A), Bull (B), and Conservative (C), who wish to place bets on the financial viability of Direstraits, Inc. (D). Why do the traders want to place these bets? Broadly, there are two reasons: Some traders may be hedging their exposure to Direstraits; for example, one of Direstraits' lenders might want to limit its losses in the event of a loan default. Other traders may have (or believe they have) information about Direstraits' prospects. These traders are called speculators because they seek to exploit price movements to make large gains in a very short time.

In the first stage, the *trading stage*, all traders agree on the terms of their trade. To be concrete, I will use the following contract (a simplified *credit default swap*, or CDS): If Direstraits goes bankrupt, the CDS seller agrees to pay the buyer $5. No seller would make this promise for free. I will therefore assume that the buyer must pay the seller $1 today (the *price* of the contract). Often, it is convenient to use the term *counterparty* when we don't want to be specific about whether we're talking about buyers or sellers. For example, Bull is Ace's counterparty and Ace is Bull's counterparty.

> A central counterparty (CCP) is one piece of the larger clearing and settlement puzzle.

In my example, Ace sells two contracts to Bull (Ace agrees to pay $10 to Bull if Direstraits goes bankrupt), Bull sells four contracts to Conservative (Bull agrees to pay $20 to Conservative if Direstraits goes bankrupt), and Conservative sells three contracts to Ace (Conservative agrees to pay $15 to Ace if Direstraits goes bankrupt). It is important to note that, at this stage, no cash changes hands; negotiation on the terms of the contract is all that's going on. In the movie, this is when brokers speak (or rather scream) on the phone and write their trades on tickets. What do they do with these tickets? They send them for clearing.

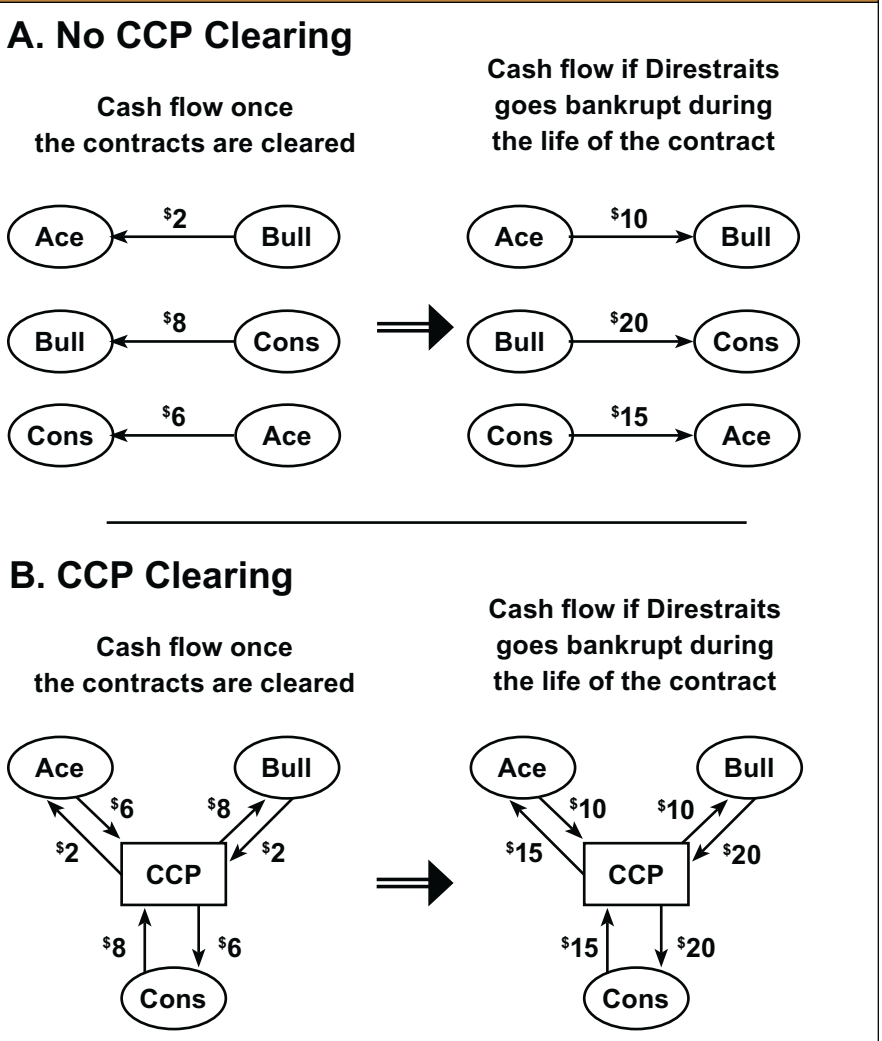
In the second stage, the *clearing stage*, the terms of the trades (as specified on the tickets) are written down in three formal contracts that Ace, Bull, and Conservative must verify. Once the terms are approved, the contracts become legally binding. The traders can add other clauses, such as the obligation to pledge collateral. For instance, the contract may require a seller to put $1 of cash in a *margin account* for each $2 it promises to pay in the event of Direstraits' bankruptcy.

If traders carry out their transactions through a CCP, there is a third stage: the *CCP clearing stage*. In this stage, the three original contracts are being replaced by six new contracts. The essential terms of the original contracts stay the same, but the CCP becomes the buyer to every seller and the seller to every buyer (this process is also known as *novation*). In our example, if Direstraits goes bankrupt, Ace now has to pay $10 to the CCP, and the CCP has to pay $10 to B, etc. The CCP may also add clauses, such as an additional collateral requirement.

Finally, at the *settlement stage*, obligations must be executed per the agreed terms. Here, cash changes hands from the buyer of the contract to the seller. Also, in our example, settlement occurs if Direstraits goes bankrupt during the life of the contract. Depending on the contract specifications, the settlement stage can extend months after the contract is cleared. Figure 1 illustrates the payments due once the contracts are cleared and in the case in which Direstraits goes bankrupt, with and without CCP clearing.

CCP clearing is therefore only an additional step between clearing

FIGURE 1



and settlement. However, this step is not without consequences, and the next section will explain its use and how traders came to introduce CCP clearing.

EVOLUTION OF CLEARING AND SETTLEMENT MECHANISMS TOWARD CENTRAL COUNTERPARTY CLEARING

Trade is at the heart of an exchange-based economy. However, counterparties to a trade may not make their promised payments; goods may be of dubious quality or, at worst, they may not be delivered. The risk that a counterparty will not fulfill its end of the contract is called counterparty risk. As in the example above, I will concentrate on counterparty risk when Direstraits goes bankrupt.

There are obvious ways to reduce these counterparty risks, but they cost time and money, and they may also limit the choices available to a counterparty. One way is to rely on the reputation of trading partners. However, building a reputation takes time, and relying on reputation restricts competition because it is hard for a new entrant without an established reputation to compete. Also, reputation will not guarantee performance by a trader that is under enough financial stress; that is, a trader may be so desperate that it doesn't really have the luxury to think about tomorrow.

A second way to limit counterparty risk is to impose a collateral requirement. Pledging a sufficiently large amount of collateral can limit counterparty risk or even completely eliminate it, if, for instance, the margin account covers all future payments. Unfortunately, the funds in the margin account are not available for other investments that might be more profitable.[4] Also, traders could monitor their counterparties, but this requires a lot of time and resources.

Conscious of the importance of managing counterparty risk, market participants introduced several modifications to clearing arrangements aimed at reducing counterparty risk in the mid to late 19th century. Improvements have occurred incrementally; however, James Moser, in his study, outlines three particular steps in the historical evolution of clearing and settlement mechanisms. While what follows is a broad historical description based largely on his work, some of the earlier and simpler arrangements are still used.

Direct Settlement. The first settlement mechanism is direct settlement. This is the most casual method of settling trades, since settlement is

[4] Collateral also involves a significant cost (and benefit). As Gary Gorton points out, "For the party calling for collateral, collateral becomes a form of funding. Because [interest] is paid on collateral, firms receiving collateral can fund themselves...when issuing debt in the market would cost them much more. This is one reason that the scramble for cash in the form of collateral calls is very important. In fact, it is difficult to convey the ferocity of the fights over collateral" (p.66).

limited to the original counterparties. An example of direct settlement is when you pay cash to buy a newspaper at a kiosk. Direct settlement works well in that case, because if you can't pay, you don't get the newspaper (and conversely, if you don't get the newspaper, the merchant doesn't get the money). In our trading example, direct settlement is represented in Figure 2. The arrows denote the flow of payments due, in the case in which Direstraits goes bankrupt. Under our scenario, Ace pays $10 to B, and so forth. However, this assumes everything is going according to plan.

In reality, in the event that Direstraits does go bankrupt, Bull (for example) has a choice: Either Bull makes the promised payment to C, or Bull can choose to default. It is important to note here that B's financial condition is not part of our simple CDS contract. In particular, in our simple example, Conservative can't opt out of the contract, even if B's ability to pay deteriorates.

This has several consequences. First, C's expected losses may accumulate if B's financial condition declines. Second, Bull might gamble on resurrection, that is, take a big risk in the slim hope of recovery. To limit losses, the contract may require that Bull place money in a margin account with C, depending on B's financial condition, for example, as measured by its credit rating. While collateral limits losses, it introduces another problem: If Direstraits does not go bankrupt during the life of the contract, Conservative may be tempted to delay or refuse to return B's collateral. So direct settlement is prone to counterparty risk, and collateral may not work very well with direct settlement.

To control default risk, ring arrangements often require traders to maintain margin requirements.

Ring Settlement. The second mechanism for settling trades is called ring settlement. The purpose of a ring settlement is to allow multilateral netting — that is, the canceling of payments of offsetting trades — by extending the set of counterparties that can settle a single contract.

Let's see how our traders might organize a ring, in which the net obligations replace the obligations of the original contracts. In the event that Direstraits goes bankrupt, Bull has promised to pay out $20, and it has been promised $10, so its net payment is $10. Ace receives a net payment of $5 (it promised to pay $10 and has been promised $15) and similarly for Conservative. Therefore, Bull pays Ace and Conservative $5 each (Figure 3).

Ring settlement requires standard or fungible — that is, easily substitutable — contracts to allow one member to substitute for another. In our example, Ace, Bull, and Conservative can form a ring, since they all trade the same contract (albeit a different number of contracts). The main benefit of netting is that it reduces the cost of open positions and, thus, the costs of a counterparty defaulting. If Direstraits defaults, Bull has to find only $10, while Ace and Conservative do not need any cash at all.

Ring settlement has three main drawbacks. First, each member must monitor all of the others, since any member may be a substitute for the original counterparty. Second, since ring members may have to monitor each other's positions, traders cannot keep their positions secret; that is, they cannot trade anonymously. This is a problem because revealing information about your position allows other traders to copy your trades or to profit by trading against you. Finally, rings can be fragile and susceptible to systemic failure, in the sense that the failure of one member may cause the failure of other members and, in

FIGURE 2

Direct Settlement

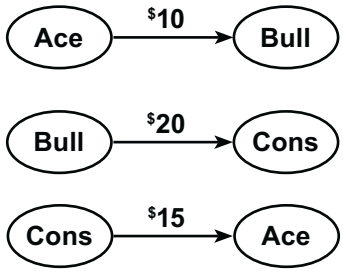
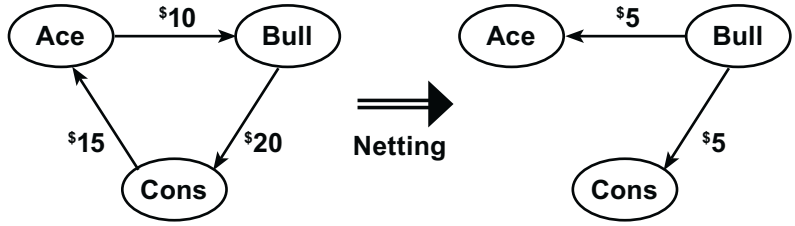


FIGURE 3

Ring Settlement



turn, the collapse of the whole ring arrangement. To control default risk, ring arrangements often require traders to maintain margin requirements.

Central Counterparty. The final settlement mechanism is through a CCP, using *CCP clearing*. To improve on the ring, a CCP replaces each existing bilateral contract with two contracts and becomes the sole counterparty (Figure 4).

CCP clearing preserves trading anonymity, since only the CCP knows the overall positions of a trader.[5] Since traders do not reveal their information to other traders, they can profitably conduct more trade. Therefore, a CCP fosters market liquidity. A CCP can also foster liquidity by standardizing the contracts it clears.[6]

The CCP, however, is not immune to the failure of one trader to pay at the settlement date. For example, Bull might not be able to pay $10 to the CCP when Direstraits goes bankrupt, but the CCP still has to satisfy its obligation to pay $5 to Ace and Conservative. To cover potential losses, CCPs use three instruments: margin requirements, position limits, and default funds. *Position limits* are limits on the number of positions that a trader can take.[7] A CCP can also use *default funds*. The CCP may require traders, before they trade, to pledge $2 each to a fund the CCP manages. The CCP then has $6 available in case Bull does not pay. If Bull pays, the CCP returns $3 each to Ace and Bull. As a consequence, traders face lower counterparty risk as long as the CCP manages its risk well. Another advantage of a CCP is to reduce monitoring costs. Indeed, contrary to the clearing mechanisms previously described whereby traders had to monitor each other, here only the CCP has to monitor traders.

As in the settlement ring, the CCP works best if contracts are completely standardized. This is the case in our example, since all traders make payments in case Direstraits goes bankrupt. However, netting is limited if contracts are only imperfectly substitutable. To see this, suppose traders also care about whether Endgame, Inc. (E) goes bankrupt. In particular, suppose Bull sells two CDS to Ace against the event that Endgame goes bankrupt (say, Bull promises to pay $10 to Ace), while other contracts remain in place. When the bankruptcies of Direstraits and Endgame are not perfectly correlated events, a CCP will not be able to fully net all positions.

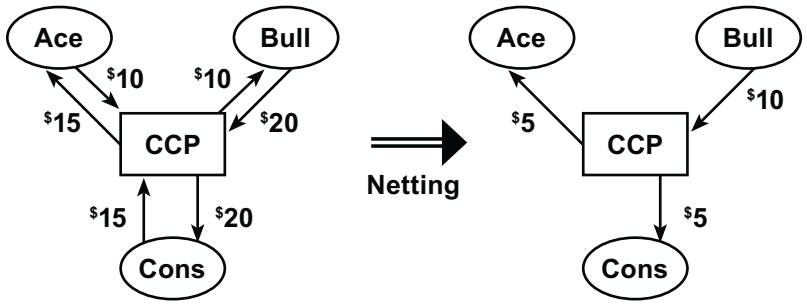
Netting is not totally excluded, even if contracts are imperfect substitutes. Rather than the exposure itself, the dollar value of the exposures can be netted. For instance, if two contracts contain obligations in different currencies, it is impossible to net the two contracts directly. However, it is possible to net them once the obligations have been converted into a single currency. This process, however, is left to the discretion of the rules governing a CCP or in the master agreement of a particular industry.[8]

Unfortunately, limited netting possibilities increase counterparty risk for the CCP. If the CCP can net all positions, it needs collateral only from Bull, who owes $10.[9] However, when netting is limited, a CCP may have to impose larger margin requirements, larger contributions to the default funds, or stricter position limits.

Finally, in addition to reducing counterparty risk, the CCP can also produce useful information for traders and can do so without compromising anonymity. If all trades have to be cleared through the CCP, the CCP has access to the specifics of all contracts. Therefore, it can gather information and release aggregate statistics on the price or quantities of the contracts traded. This is valuable because prices

FIGURE 4

CCP Clearing



[5] Of course, this requires that the CCP not reveal each member's positions.

[6] See the article by Randall Kroszner.

[7] See the paper by Yaron Leitner for a theory of position limits.

[8] See, for instance, the protocols set forth by the International Swaps and Derivatives Association.

[9] Also note that Ace and Conservative are each *owed* $5, so that with full netting, their financial condition does not affect counterparty risk.

collectively sum up the information of all traders. For example, each trader may know something about the prospect of default by Bull. Someone observing a rising price for the credit default swaps may infer that traders have raised their forecast of the likelihood of default.

LIMITS TO CCP CLEARING

CCPs are, however, not immune to failing on their obligations: If many of its counterparties default, a CCP may not have enough resources to cover all its positions. In this case, a CCP is not financially viable. For example, when Lehman Brothers failed in September 2008, markets were under particular stress. All of Lehman's positions had to be unwound, leaving market participants speculating on what the outcome would be. Were CCPs in jeopardy? Could they cover all of their obligations following Lehman's default without tapping into their default funds? Fortunately, CCPs around the world successfully conducted the unwinding process in a timely manner. (See *The Performance of Central Counterparties Clearing Following Lehman's Failure.*) Given the resilience of markets that operate with a CCP, many authorities have recently advocated in favor of extending the use of CCP clearing to other markets. To fully evaluate these proposals, we need to take account of the limits of CCPs, in particular, the difficulties of clearing over-the-counter (OTC) trades.

We can contrast two types of markets in which CCP clearing can take place: centralized markets and OTC markets. In a centralized market, contracts are very uniform, since the terms (products, quality, and settlement date) are fixed, and the only missing information to buy or sell a contract is its price. [10] All traders look at their computer screens to get price quotes, and they can buy or sell contracts with the push of a button (literally), without even knowing the identity of the seller or buyer.

One problem with standardized contracts is that they are not tailored to the needs of each trader. Traders looking for specifically tailored contracts will access an OTC market.[11] Since the terms are idiosyncratic, traders have to make phone calls or send e-mails to other traders to find out how much a specific contract costs. One drawback of an OTC market is that it is not transparent; the terms of the contract remain largely undisclosed to other participants. The lack of transparency impairs the information aggregation process that prices would normally perform.

There are two main limits to a CCP operating on an OTC market. First, Darrell Duffie and Haoxiang Zhu, in their study, show that multilateral netting is the main advantage of a CCP in reducing counterparty risk. But as we saw earlier, multilateral netting can be limited, or even impossible, when the contracts traded are not uniform.

Also, if an OTC trader defaults on its promise to pay the CCP, the CCP faces a large replacement cost risk. The less standardized the contract, the larger the cost. To understand this, suppose once again that Bull buys a CDS from Conservative, but suppose the contract specifies that if Direstraits goes bankrupt, Conservative should pay 10 Swedish krona (and not $10). In the unlucky event that Conservative himself defaults, the CCP still has to fulfill its side of the contract to B. Therefore, the CCP has to find another trader willing and able to provide 10 Swedish krona if Direstraits defaults. This may be difficult and expensive if the Swedish currency is not commonly traded in the U.S. This is an example of the replacement cost risk that a CCP faces, and the more specific a contract is, the higher the replacement cost risk will be.

If an OTC trader defaults on its promise to pay the CCP, the CCP faces a large replacement cost risk.

This is similar to a loss of a hedge by a trader. A hedge is a position with another trader in order to offset the risk originating from an initial trade. For example, wheat producers can hedge against the fluctuations of wheat prices by selling the promise to deliver wheat at a given price. If the buyer of the hedge fails, sometime before the hedge matures but after some information on aggregate wheat production is revealed, the wheat producer may find it impossible to convince another trader to buy his hedge.

To cover these costs, a CCP operating on an OTC market will naturally increase collateral requirements and the contributions to its default funds. However, the cost could be so high, and the collateral so costly to pledge, that OTC traders known to always fulfill their promises (*low-risk traders*) may reduce their trades or simply opt out of the CCP clearing arrangement altogether.

[10] To some extent, the degree of standardization is a policy variable, since the government can, for example, outlaw or tax nonstandardized agreements.

[11] See the study by Darrell Duffie, Nicolae Garleanu, and Lasse Pedersen, and the one by Ricardo Lagos and Guillaume Rocheteau.

The Performance of Central Counterparties Clearing After Lehman's Failure

As reported in the Bank of England's Financial Stability Report (October 2008), the London-based clearinghouse LCH.Clearnet was exposed, through Lehman's interest rate swap portfolio, to the risk of sharp market movements across a wide range of products. Indeed, the total notional value of the portfolio was $9 trillion, encompassing a total of 66,390 trades across five major currencies. The unwinding process was achieved through the competitive auctioning of the Lehman OTC interest rate swap portfolio. The default was managed well within the margins posted by Lehman, and LCH.Clearnet did not have to resort to its default fund.

The Depository Trust and Clearing Corporation (DTCC), the largest clearing agent for the U.S., announced in October 2008 that it had successfully closed out over $500 billion in market participants' exposure from the Lehman Brothers bankruptcy. The unwinding process was carried out by netting Lehman's positions and liquidating any remaining positions, by asset class. The largest of Lehman's positions was in securities based on mortgages, amounting to $329 billion. DTCC's Fixed Income Clearing Corporation (FICC) had plans to launch a CCP that could net mortgage-backed securities. Although it was not in operation at the time of Lehman's bankruptcy, the FICC put the idea to work and netted out $300 billion in Lehman trades related to mortgage-backed securities, or 90 percent of the outstanding value.

Lehman also held trades for $190 billion in government securities and $5.85 billion in equities, municipal bonds, and corporate debt. Subsidiaries of DTCC processed $3.8 billion in options exercises and assignments that were expiring and arranged for the release of $1.9 billion in securities with Lehman's bank to satisfy Lehman's open trades. The remaining positions were liquidated in the market. The unwinding process was therefore conducted swiftly and without resorting to DTCC's subsidiaries' default funds.*

Lehman's bankruptcy also highlights the role of information anchor that a clearing agent can play for OTC markets. With Lehman's bankruptcy, market participants speculated that the CDS market had exposure of as much as $400 billion for payments on a Lehman default. However, as DTCC announced in a press release on October 11, 2008, the payment calculations performed by the DTCC Trade Information Warehouse relating to the Lehman Brothers bankruptcy indicated that the net fund transfers from net sellers of protection to net buyers of protection were expected to be in the range of $6 billion. At the end of the unwinding process, DTCC calculated and bilaterally netted all amounts due on credit default swaps written on Lehman for $72 billion. This resulted in approximately $5.2 billion owed from net sellers of protection on Lehman to net buyers of protection.

*Source: DTCC Annual Report 2008.

If only higher risk traders use CCP clearing, the CCP may become financially unsound, unless it raises its collateral requirements, thus deterring even more traders from CCP clearing. In the end, only very high-risk traders may be willing to use the CCP, which obviously limits the insurance benefits the CCP should provide. Also, if only high-risk traders use CCP clearing, the aggregate price that the CCP would announce would not reflect all trades and would therefore limit the diffusion of the information. The bottom line is that the participation of low-risk traders in markets that trade over-the-counter and use CCP clearing is important to ensure that the market is efficient and safe.

In an article with co-authors Thorsten Koeppl and Ted Temzelides, I examine one solution to the problem of inducing low-risk traders to participate in CCP clearing. Clearly, they will participate only if the costs of using CCP clearing are sufficiently low. To reduce the cost incurred by low-risk traders, a CCP can either limit the participation of high-risk traders — for

example, through stringent position limits — or shift the cost elsewhere. Therefore, the CCP has to use another source of finance to keep contributions to the default fund and margin requirements low and position limits relatively high.

The CCP can achieve this by establishing CCP clearing that is common to both centralized and OTC markets. Suppose the CCP operates in both an OTC market and a centralized market in which traders must clear through the CCP. Then the CCP could increase the default fund contributions of traders in the centralized market and use it to finance a lower default fund for OTC market trades. The fund's contributions for OTC traders can be adjusted so that they are willing to clear through the CCP. While this hurts traders on centralized exchanges, one has to recognize that many participants are active in both types of markets, so that the overall gains from introducing a single CCP clearing arrangement can be positive.

For example, according to our analysis, it may be most efficient for a clearinghouse to clear both CDS index swaps,[12] which are standardized and could easily be traded on a centralized exchange, and bespoke CDS, which are very idiosyncratic. Collateral requirements or default funds might be set somewhat higher for those trading index swaps so that they can be set lower for those trading bespoke CDS.

To summarize, a CCP operating in several markets could subsidize its risk management activities in the OTC market using its clearing activities conducted in a centralized market. In the end, this could induce low-risk traders to participate in the CCP clearing arrangement in the OTC market

CONCLUSION

Given the large growth in trades of credit default swap contracts in the last decade, regulators and some market participants have pressed for the establishment of CCP clearing in this market. In the last year or so, considerable progress has been made, and industry participants have taken a number of steps: Multiple CDS CCP platforms are now close to starting or have already started operations. For example, NYSE Euronext through Liffe's BClear platform has been operating in Europe since October 2008. ICE Clear US has been clearing agricultural swap contracts since February 2009, and in March 2009, the Fed approved its application to become a member of the Federal Reserve System, which moves it a step closer to operating as a CCP for CDS transactions. Also in March 2009, CME Group and its associated joint venture, CMDX, announced that they have received regulatory approvals from the Federal Reserve and the Securities and Exchange Commission for clearing and trading credit default swaps through CME Clearing and the CMDX platform. Finally, Swiss-German futures exchange Eurex is also planning to launch a CCP for CDS in Europe.

In April 2009, at a meeting hosted by the New York Fed, market participants also supported broadening the use of CDS CCPs to include a wider set of firms and CDS products. They also agreed to report all CDS trades not cleared through a CCP to a central trade repository. CCPs and their members agreed to release information about their activities as they go live. In November 2008, the Depository Trust and Clearing Corporation began releasing weekly data about aggregate volume on the CDS market.

I have tried to shed light on the economic forces that lead to CCP clearing and, to some extent, explain the recent push toward the establishment of CCP clearing in CDS markets. I have also highlighted some of the difficulties of CCPs for OTC markets. Despite the clear benefits of CCP clearing, it is not obvious that this clearing arrangement fits all financial instruments. Some degree of uniformity in traders' risk profile and instruments appears to be needed to extract all of the benefits of CCP clearing. Whether we will observe a specialization of CCPs in clearing only a certain kind of trade remains to be seen.

[12] In contrast to a simple CDS, a CDS index swap gives insurance on a fixed basket of credit entities. In a simple CDS, the buyer gets insurance on any credit entity of his choice. A CDS index swap is therefore a much more standardized product than a plain CDS.

GLOSSARY OF TERMS

The Bank for International Settlements, an international organization that fosters communication and cooperation among central banks, has explained a number of terms relevant to central counterparty clearing arrangements. The glossary has been published by the BIS' Committee on Payment and Settlement Systems (CPSS) and can be found at http://www.bis.org/publ/cpss00b.htm.

Central counterparty (CCP): an entity that is the buyer to every seller and the seller to every buyer of a specified set of contracts, e.g., those executed on a particular exchange or exchanges.

Clearing: the process of transmitting, reconciling, and, in some cases, confirming payment orders or security transfer instructions prior to settlement, possibly including netting and the establishment of final positions for settlement. Sometimes the term is used (imprecisely) to include settlement.

Counterparty: the opposite party to a financial transaction, such as a securities trade or swap agreement.

Default funds (also called Loss-sharing pools): cash, securities, or possibly other assets that are provided by the participants in advance and are held by the system to ensure that commitments arising from loss-sharing agreements can be met.

Margin: margin has at least two meanings. In the futures/commodity markets, margin is a good faith deposit (of money, securities, or other financial instruments) required by the futures clearing system to ensure performance. In the equities markets, margin is a sum of money deposited by a customer when borrowing money from a broker to purchase shares. The money deposited with the broker is the difference between the purchase value of the shares and the collateral value of the shares.

Netting: an agreed offsetting of positions or obligations by trading partners or participants. The netting reduces a large number of individual positions or obligations to a smaller number of obligations or positions. Netting may take several forms that have varying degrees of legal enforceability in the event of default of one of the parties.

Master agreement: an agreement that sets forth the standard terms and conditions applicable to all or a defined subset of transactions that the parties may enter into from time to time, including the terms and conditions for closeout netting.

Multilateral netting: an arrangement among three or more parties to net their obligations. The obligations covered by the arrangement may arise from financial contracts, transfers, or both.

Novation: satisfaction and discharge of existing contractual obligations by means of their replacement by new obligations (whose effect, for example, is to replace gross with net payment obligations). The parties to the new obligations may be the same as those to the existing obligations or, in the context of some clearinghouse arrangements, there may additionally be substitution of parties.

Position limit: a restriction on the number of contracts or share of a contract's open interest that a single entity may hold.

Settlement: an act that discharges obligations in respect to funds or securities transfers between two or more parties.

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