Central Counterparties: How do they Mitigate Counterparty Risk?

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Around 90% of global derivative trades happen in over-the-counter markets. The financial crisis of 2007-09 exposed inefficiencies over large bilateral positions between the counter parties, and the associated lack of transparency. Insufficient collateral intensified these problems and considerably reduced the market liquidity. Consequently, regulators pushed legislation for clearing of OTC trades through approved clearinghouses that offer Central Counterparty Services. This article elucidates how central counterparties provide practical solutions to mitigate the counterparty risk, and thereby delivers operational and financial efficiencies to market participants by offering a guaranteed settlement.

1. Introduction
Financial market infrastructures (FMIs) [BIS: 2012] play a major role in protecting the financial stability and promoting sustainable economic growth. They not only facilitate clearing and settlement of transactions in financial markets, but also enable global movement of funds and securities. Careful management of FMIs is critical; else, they can cause serious systemic risk, especially during times of financial distress. For these reasons, central banks have an inherent interest in financial market infrastructures. FMIs include Payment Systems (PS), Central Securities Depositories (CSDs), Central Counterparties (CCPs), Securities Settlement Systems (SSSs), and Trade Repositories (TRs). The focus of this article is on CCPs, and how do they manage and mitigate the counterparty risk.

A central counterparty (CCP) is an institution that interposes between two trading parties. Clearing and settlement of market transactions are the two main functions carried out by CCPs. Clearing relates to identifying the obligations of both the parties to a transaction and settlement marks the final transfer of securities and funds. CCPs function as a matching seller to the buyer and a matching buyer to the seller, and thereby guarantee the performance of the underlying transaction (See Figure 1 [Marcus Zickwolff; 2010]). This substitution of counterparties is done through a legal process, called ‘contract novation’ that releases the contract between the original trading counterparties and generates two new, legally binding contracts between the CCP and each of the original trading counterparties, thus, transferring counterparty risk to the clearinghouse.

(a) Bilateral Clearing
Default of Bank ‘A’ in OTC derivative transaction has a cascading effect. It impacts all the concerning counterparties from Bank ‘A’ to ‘F’

(b) Central Counterparty Clearing
If Bank ‘A’ defaults the others are protected through the default management procedure of CCP

Figure 1 Counterparty Risk Scenarios

2. Backdrop
A series of financial crisis ranging from Barings bank to Enron to WorldCom to the bankruptcy of Lehman Brothers to the credit crunch of 2007 and 2008 caused a massive domino effect on the bilaterally traded over-the-counter (OTC) trades. The crisis exposed market and financial inefficiencies because large segments of the market were not standardized and automated. As a consequence, both OTC market participants and regulators
have realized that clearing houses that offer CCP services provide practical solutions that the financial market needs, namely, transparency and efficient mitigation of counterparty risk.

After their meeting in Pittsburgh in September 2009 [Pittsburgh Summit; 2009], G20 Nations [G20; 2014] called for extensive changes to develop OTC derivatives markets. They explicitly stated that all standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms and cleared through central counterparties by end 2012 and that OTC derivative contracts should be reported to trade repositories. They further stated that non-centrally cleared contracts should be subjected to higher capital requirements. They asked the Financial Stability Board (FSB) and its relevant members to regularly assess the implementation of these decisions and their adequacy to improve transparency in the derivatives markets, mitigate systemic risk, and protect against market abuse. The governments and regulators, especially in Europe and the US, have pushed for legislation forcing users of OTC contracts to clear their OTC trades through an approved clearinghouse offering CCP services.

3. Availability and Use of Central Counterparties
Market participants have been increasingly using the services of CCP for key OTC derivatives markets in interest rate and credit. However, there is still substantial potential for increased use of CCPs for clearing these standardized OTC derivatives as discussed in the following sections.

Availability of CCPs
The FSB reported in April 2014 that a few CCPs are available to clear some products in all the five asset classes, namely, commodity, credit, equity, foreign exchange and interest rate. Several CCPs have indicated plans to expand their clearing services (see Table 1) [FSB Report; 2014]. More details on CCPs providing clearing in each OTC derivatives asset class, their location, authorities with which CCP is licensed or authorized are provided in the report [FSB Report; 2014]. The largest range of CCPs is available for the clearing of interest rate derivatives with 16 CCPs clearing some types of products or the other in this asset class. The other asset classes currently have fewer CCPs offering clearing services.

Usage of CCPs
At a global level, the notional amount of centrally cleared transactions as a percentage of notional outstanding has increased for interest rate and credit derivatives. Based on transactions reported to DTCC by a group of large dealers as of February 2014, the gross notional outstanding amount of centrally cleared positions was $191 trillion in the segment of OTC interest rate derivatives [FSB Report; 2014]. This represented around 59% of the $325 trillion that could have been centrally cleared based on existing CCP offerings.

The gross notional outstanding amount of credit derivatives across all market participants was $18 trillion as of February 2014, of which $8.2 trillion (47%) could be centrally cleared through current offerings of CCPs. The reported actual CCP clearing of credit derivatives was $3.3 trillion (19%). The gap, thus, suggests that there remains substantial potential for additional uptake of central clearing.

Data related to proportion of new transactions that are being centrally cleared in the US is publicly available through Commodity Futures Trading Commission (CFTC). It reported that since Q4 of 2013, around 70% of the notional value of single currency interest rate derivatives were centrally cleared. The rate of central clearing for credit derivative indices was around 95% of the notional value of trades being cleared in the last weeks of February 2014, which is, up from around 50% during October 2013. As reported, the new client transactions in interest rate derivatives cleared across CME and LCH Clearnet Ltd. was $11 trillion in February 2014, which is more than double the amount that was cleared a year earlier [FSB Report; 2014].

The Role of CCPs
Bilateral counterparty risk in the OTC segment is a major drawback and a serious peril to the financial environment. Therefore, CCP risk management capabilities for mitigating counterparty risk are critical to the safety of the global financial markets. While CCPs reduce the likelihood of counterparty defaulting through the novation process, they also manage to reduce the consequences of a possible default by other means.

The underlying principle is as follows. When an order to buy from Party ‘A’ is matched with an order to sell from Party ‘B’ in order-driven market systems [LIFFE CONNECT], neither party is aware of the other party’s identity. As soon as the exchange matches the orders, the data gets systemically transmitted to the clearinghouse. The clearinghouse then takes over the obligations to make payments and/or deliver the relevant securities or derivatives.

As a part of the risk management process, CCP does a Multilateral Settlement Netting (MSN) of all offsetting open derivatives contracts from every trading party across all other trading parties. For example, if Party A makes 100 trades on a given day from 100 different other parties, for buying 100 shares of XYZ Ltd. in each trade, then there will be 100 settlements of XYZ Ltd. shares with Party A. With MSN service, Party A would
have only one settlement of its obligations in XYZ Ltd. shares. Moreover, the CCP provides the additional benefit of reduced settlement costs to its member firms.

**The Following is a Simplified Example of MSN:**

Bank A has an exposure of $6 million to Bank B and Bank B has an exposure of $10 million to Bank C and Bank C has an exposure of $8 million to Bank A. These are bilateral exposures as indicated in top section of Figure 2 [Amandeep Rehlon and Dan Nixon; 2013].

Following the novation process, CCP interposes itself between the trading parties as represented in the middle and the bottom section of figure 2. With this, the gross exposures get netted and reduce the default exposure. In this example Bank B has an exposure of $10 million for trades with Bank C and this is the maximum potential loss in the event of any default. However, through the novation process, it has a net exposure of $4 million to CCP.

![Multilateral Settlement Netting](image)

Figure 2 Multilateral Settlement Netting
The netting of payments also reduces the liquidity needs of the member firms. In Figure 2, Bank A is obligated to pay $8 million and receive $6 million. With CCP, the payment obligations get reduced to a single net settlement of $2 million, as shown in bottom section of Figure 2.

<table>
<thead>
<tr>
<th>Asset class</th>
<th>Currently operating</th>
<th>Not yet operational</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodities</td>
<td>12</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Credit</td>
<td>6</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Equity</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>FX</td>
<td>9</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Interest rate</td>
<td>16</td>
<td>0</td>
<td>16</td>
</tr>
</tbody>
</table>

This process reduces the gross risk exposure of trading parties, which is much higher in the OTC segment that uses bilateral netting. In doing so, the CCP’s own risk gets reduced and any possible loss occurring as a result of a default is managed through appropriate margins and capital deposits of CCP. In fact, the clearing members of CCP actually require less regulatory capital as CCPs have the capacity to mutualize losses by utilizing the default funds. While CCP’s ability to meet its obligations is monitored by the Financial Services Authority (FSA), CCP has to watch for the ability of its member firms to meet their obligations. It does this by insisting the member firms to place collateral with the CCP to meet margin requirements.

**The Following is a Simplified Example**

Party ‘A’ buys a futures contract on April 1, 2014, that obligates it to take delivery of 1,000 shares of XYZ Ltd., on May 31, 2014, in return for a payment of $10 per share. The total amount it has to pay to the CCP if it still holds the contract on May 31 would be $10,000.

Suppose, by April 15, the share price of XYZ Ltd. drops to $8 per share, and then Party ‘A’ stands to lose $2,000 if it still holds the position. The CCP, therefore, requires Party ‘A’ to make a margin payment of $2,000 to cover the CCP’s risk.

If at some time between April 15 and May 31, the share price of XYZ Ltd. rises to $9 per share, the CCP will make a refund of $1,000 to Party ‘A’. Suppose, the price falls to $7 per share, the CCP will demand another $1,000 from Party ‘A’. Margin calls need not necessarily be paid in cash, as CCPs accept the deposit of a wide variety of government bonds and other collateral as cover for initial margin.

Thus, whenever a member firm’s positions show potential losses it must make a margin payment to the clearinghouse. In doing so, the clearinghouse is protected against default by the member firm. The actual calculations performed by the CCP are more complex and cover two aspects of margin, namely, initial margin and variation margin. Most clearinghouses use a system known as SPAN (Standardized Portofolio Analysis of risk) for calculating the margin requirements.

Clearing members must also meet collateral requirements as per the rules and are governed by the margining guidelines of the CCP. The CCP calculates the change in value of the positions of its members on a daily basis and sometimes even intraday or real-time. If the members sustain losses, they must post additional collateral. The initial margin requirements are set at levels that are expected to cover estimated market moves under normal conditions.

### 4. Managing Defaults

All clearing members of CCP require a clearing license, which is issued only upon meeting the prescribed conditions like minimum levels of equity capital, and compliance with technical specifications to make sure that the transactions are properly recorded and monitored. In doing so, CCP establishes minimum quality standards for its members and regularly monitors the ability of the members to meet their financial obligations.

Through a well-defined default waterfall hierarchy, CCPs would manage the default risk of its trading members and ensure the continuity of the trading system. The defaulting member’s sources are used to absorb the losses as a first line of protection. This includes the initial margin and its contribution to the pool of default fund. The capital of the CCP will then be knocked if losses are still not covered. Sources of non-defaulting members in the default fund pool would be drawn only as a last resort to mutually share the losses.

### 5. CCP Risk Management

As CCP interposes itself between the two sides of a bilateral transaction, and its position with a single counterparty is always offset by an opposite position taken with a second counterparty. This means CCPs do not take on market risk that occurs due to a change in the market value of the trades that they enter into. Thus,
CCP is not exposed to market risk on the cleared positions. Therefore, CCP runs what is known as a ‘matched book’.

CCPs may face default risk, which is the risk that counterparty will have insufficient funds to meet its financial obligations as and when expected. It does not matter whether the counterparty may be in a position to meet its financial obligations in the future. The risk that a seller of an asset does not receive payment when due, causes liquidity risk, forcing the seller to borrow or liquidate assets to complete his other payment obligations. On a similar note, liquidity risk also includes the risk that a buyer of an asset does not receive the delivery when due, thus forcing him to borrow the asset in order to complete his other delivery obligations. In this way, on settlement date, both parties to a financial transaction are exposed to liquidity risk. If liquidity problems occur in distress conditions, like when the market is illiquid or when asset prices are swiftly changing, or when there are solvency concerns, they have the potential to create systemic problems.

In order to minimize the exposure of CCP in the event of a default by a clearing member, changes in the value of cleared positions are managed through regular payments of variation margin. When the value of net position of a clearing member falls, he pays to the CCP the value of such decrease. This variation margin is then paid by the CCP to the clearing member whose net position has an increased value.

If a clearing member defaults and fails to pay the variation margin, then CCP is exposed to market risk and will no longer have a ‘matched book’. The unmatched positions are now open to change in the value of asset prices. In such a situation, CCP will have to close out its unmatched position by entering into offsetting transactions or by auctioning the positions to non-defaulting clearing members.

![Figure 3: A Standard Default Waterfall Structure](image)
CCPs face a contingent risk of loss during adverse move of market prices. The protection against this risk is the initial margin that it collects from the clearing members. Initial margin could be securities or cash. This is the first line of defense and should be adequate to cover the probability of loss. The process of clearing puts limits on overall trading positions and quantifies the estimated losses that could occur. Risk managers devise models to price the value of the trading position at all times. Using these models, one calculates margin requirements and adjusts the same to the changes in market prices or market conditions impacting the size of losses [Haene and Sturm; 2009][Nahai-Williamson; 2013].

In case the margin that the CCP holds from the defaulting clearing member is inadequate to meet the loss, the CCP maintains a “default waterfall” of further resources that can be called upon. The “default waterfall” refers to the financial safeguards available to a CCP and the order in which they are expended in the event of a default. The “end-of-the-waterfall” refers to situations following the exhaustion of all such safeguards. Figure 3 [ISDA; 2013] illustrates a standard default waterfall structure.

If the collateral posted by the clearing member is inadequate to meet the amount owed to CCP, the CCP can then draw on the defaulting member’s contribution to the default fund. Default fund is pre-funded to which all clearing members are required to contribute; normally in relation to the amount of risk that each brings to the CCP. This mutualizes the losses exceeding the initial margins provided across the surviving members of the CCP.

Before utilizing the default fund contributions of surviving members, the CCP may itself make a contribution to the default waterfall from its own capital resources. This would indicate that as far as possible the losses are managed through the resources of the defaulting member, instead of passing it on to the surviving members.

If a CCP’s own resources get exhausted, it may mutualize the residual loss by drawing on default fund contributions of the surviving members. If the default funds also get exhausted, CCPs may call on the surviving members for an additional contribution up to a pre-determined limit. This is called rights of assessment.

Finally, if no other resources are available to meet the losses, the CCP’s remaining equity is thereafter utilized to absorb losses. If the remaining equity of the CCP is insufficient to cover the unabsorbed losses, the CCP becomes insolvent and that would be the “end-of-the-waterfall”.

**End-of-the-Waterfall Situations can Arise where [ISDA; 2013]**

1. The resources in the default waterfall gets exhausted by mark-to-market losses on the CCP’s open risk positions before the completion of the auction process and determination of settlement price.
2. Upon finalization of an auction, the price at which clearing participants would be willing to assume the CCP's open risk position exceeds the remaining resources in the default waterfall bucket.
3. The auction process fails.

**6. Defects of the “Default Waterfall”**

The default waterfall structure has a number of defects in addressing risks emanating from the clearing members as well as from the CCP itself. “End-of-the-waterfall” does not mean that CCPs are bankruptcy remote and this will depend on the prevailing insolvency law.

A consortium of about 20 insurers have recently stepped in to address the possibility of the “end-of-the waterfall” situation by offering to provide a safety net of about $6 billion to $10 billion to clearinghouses such as the CME Group or the LCH Clearnet Group [Reuters; 2014]. Although, this is an insurance plan against CCP insolvency, it is a mere transfer of risk from clearinghouses to the insurers, thereby increasing the cost of doing business for the CCP users. A similar protection could be managed by CCP itself by raising the initial margins in response to swift changes in the market conditions. But, this may put CCP to risk as CCP members may rush to liquidate their positions when the market may have already become illiquid. The other option being considered by the regulators is Variation Margin Gains Haircutting (VMGH), where the net in-the-money positions of the clients of clearing members are used to cover losses at the “end-of-the-waterfall” [ISDA; 2013].

**7. Non-Default Losses (NDL)**

NDL occurs when CCP’s loss go beyond its minimum regulatory capital. These losses occur due to operational failure of CCP and not because of the default of clearing members. Therefore, NDL should be borne first by the holders of the CCP’s equity and debt. It could impact a clearing participant only to the extent of his equity or debt claim on the CCP’s capital.

Major global CCPs have managed financial crises ranging from Drexel Burnham Lambert (1990) to Lehman Brothers (2008). In these cases, CCPs managed these default events well within the margin and other financial resources available to them and by closing out or transferring the positions of the defaulters. The counterparty creditworthiness provided by CCPs helped the financial markets to recover from these crisis events. In retrospect, CCPs have globally shown their ability to manage extreme price volatility and member defaults.
8. Reforms
As OTC markets dominate the global derivative trading volume, governments and regulators, primarily in US and Europe have pushed for legislation compelling the users of OTC derivative markets to clear their trades through CCP. In July 2009, the European Commission initiated the central clearing of standardized OTC derivatives. With the introduction of mandatory central clearing for standard OTC derivatives, CCPs will become the most systemically important market participants in FMI. Therefore, CCPs must establish robust recovery and continuity mechanisms, as per standards set out in the European Market Infrastructure Regulation (EMIR) and by the Committee on Payment and Settlement Systems and International Organization of Securities Commissions (CPSS-ISOCCO), to avoid CCP insolvency. Once a CCP has approved recovery rules in place to cover specific sources of losses, the systemic risk arising from a CCP failure would get reduced. In addition, the clearing members and other clearing participants must have the ability to measure and manage their risk to the CCP. This requires that CCP rules relating to all stages of its lifecycle, including recovery and resolution, must be constructed with care.

As global financial markets are interconnected, it is prudent for CCPs to exchange relevant information and act in collaboration. Therefore, leading clearing houses formed CCP 12 to promote sharing of information and best practices in CCP risk management.

Four Safeguards for CCPs
Continued efforts are being made for the implementation of the four safeguards to support a strong and efficient global framework for central clearing. The FSB will continue to monitor progress in ensuring that the four safeguards are in place.

The four safeguards are [FSB Report; 2014]
1. Fair and open access by market participants to CCPs, based on transparent and objective criteria
2. Cooperative oversight arrangements between relevant authorities, both domestically and internationally to ensure a robust set of regulations and oversight of global CCPs
3. Resolution and recovery regimes to ensure the core functions of CCPs are maintained during times of crisis and that it considers the interests of all jurisdictions where the CCP is systemically important and
4. Appropriate liquidity arrangements for CCPs in the currencies in which they clear.

Progress in International Guidance for Reforms
There has been continuing progress in the implementation of OTC derivatives market reforms. While, the key international policy standards have been finalized, work on the remaining standards is planned to be finalized by the November 2014, G20 Leaders Summit.

Progresses made on developments in meeting the underlying G20 objectives on various commitment areas are summarized here.

Jurisdictional Progress on Central Clearing [FSB; 2014]
1. In the European Union (EU), Stockholm-based NASDAQ OMX Clearing has become the first authorized CCP in Q1 2014, compliant with EMIR. This has prompted processes to identify the OTC derivatives products that might fall under a clearing obligation in the EU.
2. China, Japan and the US have implemented their first clearing mandates.
3. The Australian Government made a proposition to allow for clearing requirements in certain OTC interest rate derivatives to be placed on large financial institutions with major cross-border transactions.
4. In April 2014, Hong Kong adopted the legislative framework needed to further reform trade reporting, central clearing, and trading on exchanges or organized trading platforms.
5. Since the September 2013 progress report, Korea and India adopted regulation, and Mexico and Russia reported proposing or publishing regulation for consultation.

By the end of 2014, Korea and Singapore are expected to bring some clearing requirements and Hong Kong anticipates proposing rules to implement clearing requirements. Clearing obligations are also expected to be operative in Canada, the EU and Hong Kong during 2015.

9. Cross Border Coordination
Few CCPs are currently permitted to operate in more than one or two jurisdictions. They cause challenges to the broader global uptake of central clearing, specifically to the participants engaged in cross-border transactions. If CCPs are not permitted to operate in jurisdictions with cross border trades, then the markets would face hurdles to meet their clearing obligations. To maintain cross border market activity, permission from authorities for foreign-based CCPs to provide services in their jurisdiction is critical. A number of CCPs incorporated outside UK are functioning in UK as Recognized Overseas Clearing Houses (ROCHs). Examples
of ROCH include Eurex Clearing AG, ICE Clear US Inc, LCH Clearnet SA, and Chicago Mercantile Exchange. The Regulators Group will report to the November 2014, G20 Leaders Summit how it has resolved or plan to solve identified cross border issues.

Capital Requirements for Bank Exposures to CCPs
Basel III standards for handling bank exposures to CCPs are being finalized by the Basel Committee on Banking Supervision (BCBS). The standards for banks capital treatment of centrally cleared and non-centrally cleared derivative exposures have been, by and large, completed. BCBS recently published a new approach for assessing counterparty credit risk associated with derivative transactions [BCBS; 2014]. The new standards are expected to be effective from January 1, 2017 and would replace the Current Exposure Method and the Standardized Method, which are in use now for assessing counterparty credit risk.

Margin
Some jurisdictions have started developing regulatory guidelines to implement the recently finalized BCBS-IOSCO margin standards for non-centrally cleared derivatives. While the US regulators have published regulatory proposals, the EU is currently drafting rules that are expected to take effect by end 2014. Several jurisdictions have reported that they expect taking steps for implementation of guidelines by 2015 [FSB; 2014].

Organized Platform Trading
Most of the jurisdictions expect to have requisite legislation during this year to support augmented use of exchanges and trading platforms for OTC derivatives trades. While China, Japan, and the US have mandatory trading requirements in place, the other jurisdictions are in the process of developing this. The implications of this lack of consistency in jurisdictions approaches will be considered by the FSB.

Risk Mitigation Requirements for Non-Centrally Cleared Derivatives
A working group established by IOSCO is looking into the development of standards for risk mitigation requirements for non-centrally cleared derivatives. This working group is expected to develop the standards for trade confirmation, portfolio reconciliation, portfolio compression, valuation, and dispute resolution, and resolve the prevailing inconsistent approaches to risk mitigation requirements in different jurisdictions, which have been a hurdle, especially, in resolving some cross-border regulatory issues. An interim report is expected by mid 2014 and the final report by end 2014 [FSB; 2014].

Recovery and Resolution of FMIs [FSB; 2014]
Principles for Financial Market Infrastructures (PFMI) should have rules and procedures to address any credit losses, liquidity shortfalls and recovery plans. The FMI recovery report [CPSS-IOSCO; 2013] is meant to govern this. The report focuses on broad framework of recovery planning and specific recovery tools that FMIs might use. The final reports are expected in the first half of 2014.

Quantitative Disclosure Requirements for Central Counterparties [FSB; 2014]
CCPs are expected to publish certain quantitative data regularly to meet the PFMI principle on transparency. The consultative document regarding this was released by CPSS and IOSCO in October 2013. The qualitative information disclosure framework for FMIs was published in December 2012. These two documents are meant to support CCP’s stakeholders to better understand the CCP’s risks and risk control process. A final report is under preparation.

The FSB will publish a further progress report ahead of the November 2014 G20 Leaders Summit.

10. Conclusion
CCPs are a key element in the financial market infrastructure and enable a smooth settlement of financial market transactions. A CCP interposes itself between counterparties, becoming the buyer to every seller and the seller to every buyer and thus, ensures the performance of open contracts. Through multilateral netting of trades and by enforcing effective risk controls on all market participants, CCPs have the potential to mitigate the counterparty risk significantly. CCPs mandate every participant to provide collaterals to cover their existing and potential future exposures. CCPs have well defined guidelines to mutualize certain risks through tools such as default funds. As a result of their ability to reduce counterparty risks, they can also reduce systemic risk in the markets they serve. Today, CCPs have an expanded role that includes robust transaction processing, post trade management functions, management of collaterals, and settlement of obligations through payment or delivery.

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