



Understanding Derivatives: Markets and Infrastructure

02

Central Counterparty Clearing

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*A central counterparty interposes itself between counterparties to contracts traded in ... financial markets, becoming the **buyer to every seller and the seller to every buyer** thereby ensuring the performance of open contracts.¹*

Modern central counterparty (CCP) clearing arrangements typically involve counterparty substitution by means of novation or an equivalent legal mechanism.² This arrangement has many advantages, such as simplifying and making more transparent the credit chains that may develop in repeated transactions among market participants. It also provides a foundation for centralized risk management (such as multilateral netting, collateralization, and loss mutualization) and data processing operations (such as trade registration and reporting) that benefit clearing members of the CCP. However, centralized clearing also has some disadvantages, such as the concentration of credit, liquidity, operational, and legal risk in the CCP.

Because the CCP becomes a principal to all trades with its clearing members, it must carry out the future performance obligations to which they initially agreed. The CCP acts on its own behalf (as principal) and for the mutual benefit of its clearing members by imposing risk management policies and establishing operational processes to support the settlement of transactions cleared through

the CCP. It also plays a fundamental role in responding to and resolving clearing member defaults and other circumstances that threaten the orderly operation of the clearinghouse.

This tends to align the CCP's incentives with the interests of its clearing members, who are dependent upon the CCP to perform those obligations and who are exposed to the risk of loss in the event that a clearing member's default or some other circumstance makes it impossible for the CCP to fully carry out that duty.

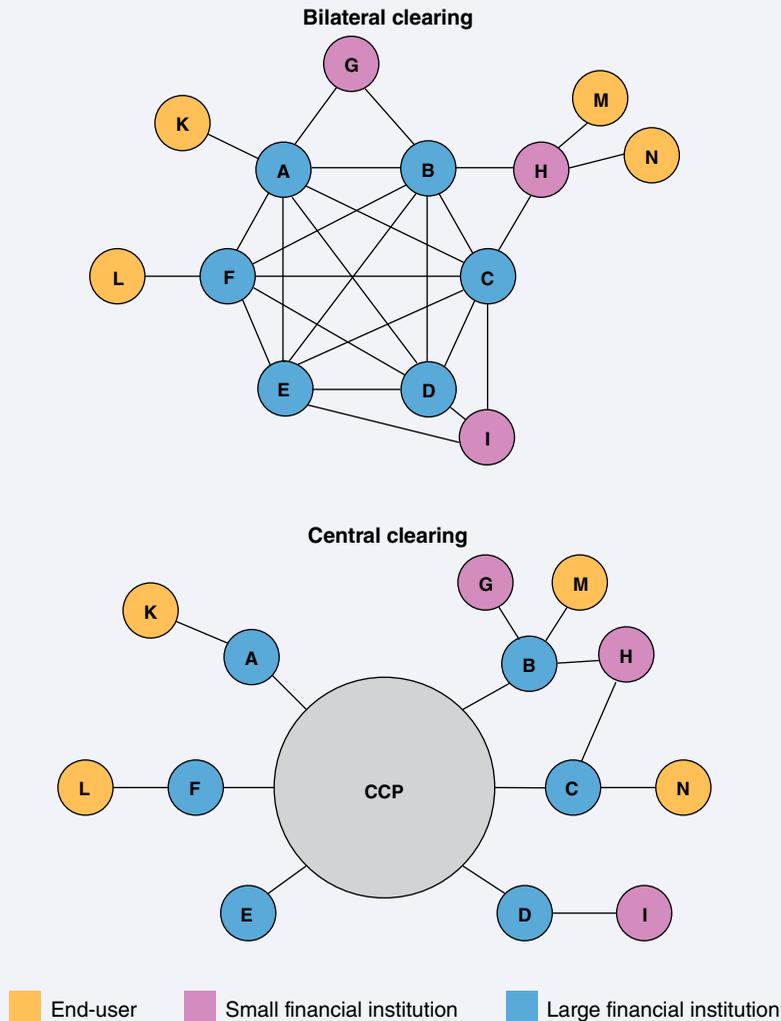
The benefits of central clearing are illustrated in figure 1. The upper panel shows a tangled web of opaque and sometimes overlapping counterparty relationships that typify transactions that are not centrally cleared. The counterparty relationships in this example are opaque because only the bilateral counterparties to each trade stand in direct contractual relationships (a relationship that lawyers refer to as "privity"³). Consequently, no single market participant can have a complete view of the credit and liquidity relationships upon which it is dependent (even if only indirectly).⁴ As noted in Reserve Bank of Australia (2011), the substitution of a central counterparty—as illustrated in the lower panel of figure 1—"allows the numerous bilateral exposures of a market participant to be substituted for a single net exposure to a financially and operationally robust"⁵ counterparty.

Legal Framework

How does the CCP become a substituted counterparty to a preexisting, legally enforceable contract? The answer to that question turns on the law of contract in the jurisdiction (or jurisdictions) in which the CCP operates. Most modern clearing arrangements depend on one of two legal doctrines to support the interposition of the CCP as common counterparty to all trades—novation and open offer. As CPSS-IOSCO (2012) explains:

A CCP becomes counterparty to trades with market participants through novation, an open-offer system, or through an analogous legally binding arrangement.

Through *novation*, the original contract between the buyer and seller is extinguished and replaced by two new contracts, one between the CCP and the buyer, and the other between the CCP and the seller. In an *open-offer* system, a CCP is automatically and immediately interposed in a transaction at the moment the buyer and seller agree on the terms.⁶



Source: Reserve Bank of Australia, Central Clearing of OTC Derivatives in Australia (June 2011), available at: <http://www.rba.gov.au/publications/consultations/201106-otc-derivatives/central-clearing-otc-derivatives.html>

I will briefly explore the development and dynamics associated with one of these legal mechanisms for counterparty substitution later in this chapter, but first I consider how counterparty substitution affects the rights and duties of the parties to a financial contract. I begin with a series of diagrams that illustrate ordinary bilateral counterparty relationships to trades that are not submitted for clearing by a central counterparty.

Figure 2 indicates that the counterparties (designated “Dealer A” and “Hedge Fund,” respectively), have entered into a legally binding financial contract, with Dealer A taking a long position (as buyer) and the Hedge Fund taking a short position (as seller).⁷ In the next illustration (figure 3), I show that Dealer A has decided to neutralize its risk position by entering into a legally enforceable financial contract with another counterparty (designated as “Dealer B”).

Dealer A’s risk position is neutral (or “balanced”) because it is both a buyer (from the Hedge Fund) and a seller (to Dealer B) of the same underlying interest. However, Dealer A has credit exposure to both of its counterparties and, as will be seen in figure 4, an implicit credit chain runs through Dealer A.

The real parties in interest to this sequence of transactions are Dealer B (the long position) and the Hedge Fund (the short position), although they do not have any direct contractual relationship and, in fact, may be completely unknown to each other. Because Dealer A has separate, enforceable contracts with each of its counterparties, it is vulnerable to a default by either counterparty, as illustrated next.

Figure 5 shows the consequences if one of the real parties in interest (in this case, Dealer B), becomes unable or unwilling to perform its contractual obligations to Dealer A. Dealer A’s risk position—which had been neutral—becomes unbalanced because it remains a buyer (from the Hedge Fund), even though Dealer B will no longer perform on the contract. Dealer A may have anticipated this possibility and taken steps to mitigate the counterparty credit risk it assumes with respect to its counterparties. For example, it may have taken collateral from each of the Hedge Fund and Dealer B (because it cannot foresee which of its two counterparties might default).

Now I turn to how the substitution of a central counterparty changes the credit risk dynamics involved in such transactions, starting from the same bilateral position as illustrated above.

Once again, assume that Dealer A and its counterparty (here designated “Dealer B”) have entered into a legally binding financial contract—with Dealer A taking a long position (as buyer) and Dealer B taking a short position (as seller).

2. Base Transaction (Bilateral, Non-Cleared Trade)



	Dealer A	Dealer B	Hedge Fund
Trade (1)	Buy 100 (from HF)		Sell 100 (to Dealer A)
Combined Position	Buy 100 (Long)		Sell 100 (Short)

Source: Federal Reserve Bank of Chicago.

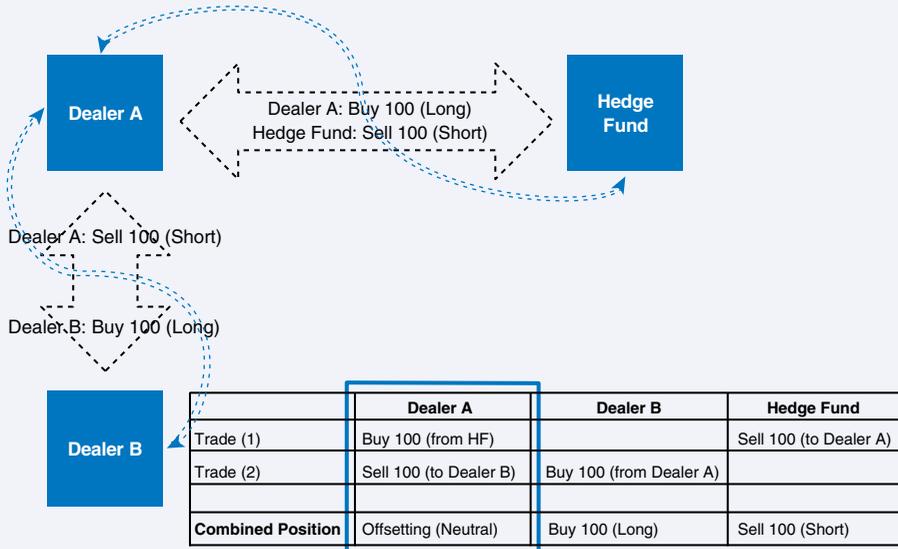
3. Additional Transaction (Bilateral, Non-Cleared Trade)



	Dealer A	Dealer B	Hedge Fund
Trade (1)	Buy 100 (from HF)		Sell 100 (to Dealer A)
Trade (2)	Sell 100 (to Dealer B)	Buy 100 (from Dealer A)	
Combined Position	Offsetting (Neutral)	Buy 100 (Long)	Sell 100 (Short)

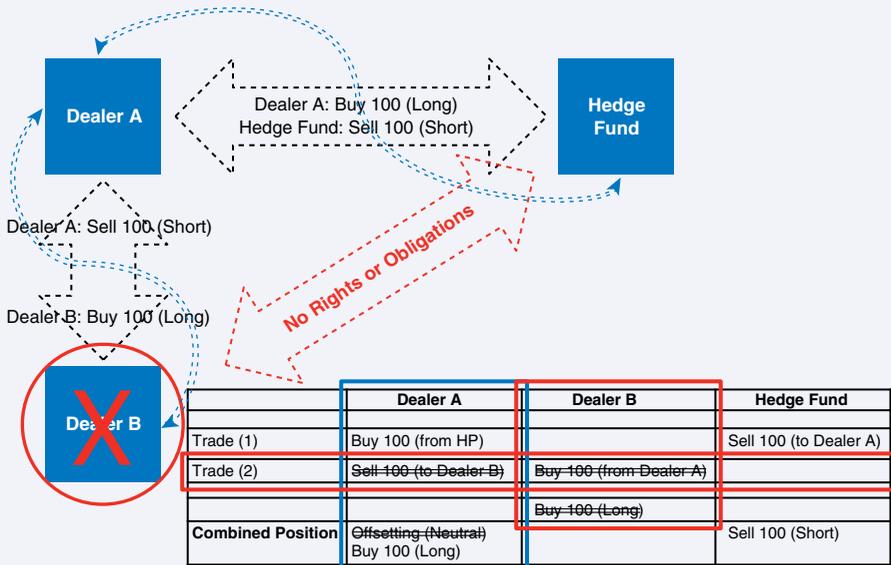
Source: Federal Reserve Bank of Chicago.

4. Implicit Credit Chain (Bilateral, Non-Cleared Trade)



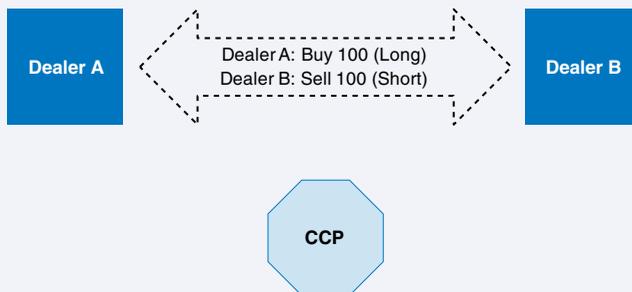
Source: Federal Reserve Bank of Chicago.

5. Consequences of Default (Bilateral, Non-Cleared Trade)



Source: Federal Reserve Bank of Chicago.

6. Base Transaction (Cleared Trade)



	Dealer A	CCP	Dealer B
Trade	Buy 100 (from Dealer B)		Sell 100 (to Dealer A)
Combined Position	Buy 100 (Long)		Sell 100 (Short)

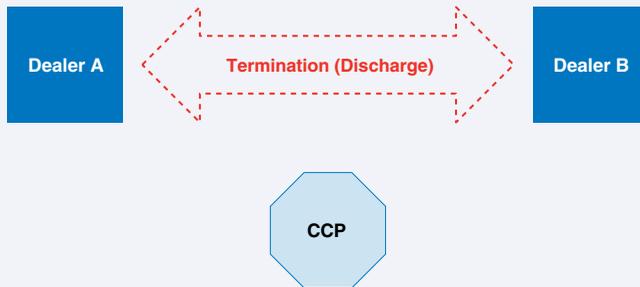
Source: Federal Reserve Bank of Chicago.

In the next two figures (7 and 8), I illustrate the steps involved in novation of the contract between Dealers A and B, with the result that the central counterparty becomes substituted as the common counterparty to both A and B. As explained in CPSS-IOSCO (2012), novation is one of two legal concepts generally recognized as a basis for counterparty substitution in most major financial centers and it is the technique illustrated in this chapter. Although the term is a bit arcane—apparently derived from Roman law⁸—the basic principles of novation are rather simple:

Novation is a means of discharging a debt. A *new contract* is substituted for an existing contract, between either the same parties or different parties, the consideration usually being the discharge of the old contract. Thus, with novation, a new legal basis is created for contractual rights and obligations. Novation requires a binding contract and intention to enter into a novation. If the latter is absent, there are two contracts.⁹

When it involves the creation of obligations on the part of a new counterparty (like a CCP), novation is loosely related to the concept

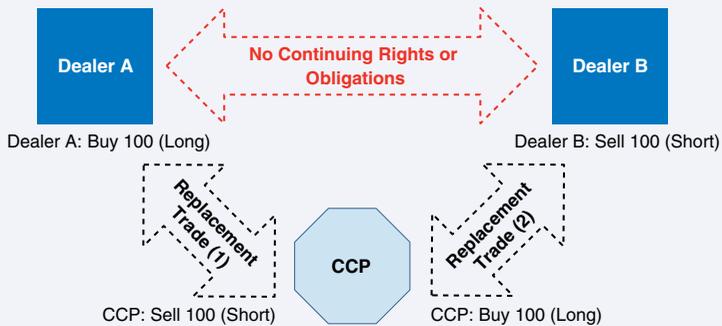
7. Novation—Contract Termination (Cleared Trade)



	Dealer A	CCP	Dealer B
Trade	Buy 100 (from Dealer B)		Sell 100 (to Dealer A)
Combined Position	Buy 100 (Long)		Sell 100 (Short)

Source: Federal Reserve Bank of Chicago.

8. Novation—Counterparty Substitution (Cleared Trade)



	Dealer A	CCP	Dealer B
Trade	Buy 100 (from Dealer B)		Sell 100 (to Dealer A)
Replacement Trade (1)	Buy 100 (from CCP)	Sell 100 (to Dealer A)	
Replacement Trade (2)		Buy 100 (from Dealer B)	Sell 100 (to CCP)
Combined Position	Buy 100 (Long)	Offsetting (Neutral)	Sell 100 (Short)

Source: Federal Reserve Bank of Chicago.

usually called “assignment” by non-lawyers, but the two concepts are distinct.

The first step in the process is for the contract between A and B to be terminated; simultaneously, as illustrated next, separate, enforceable contracts are entered into by each of the CCP and its clearing members, Dealers A and B.

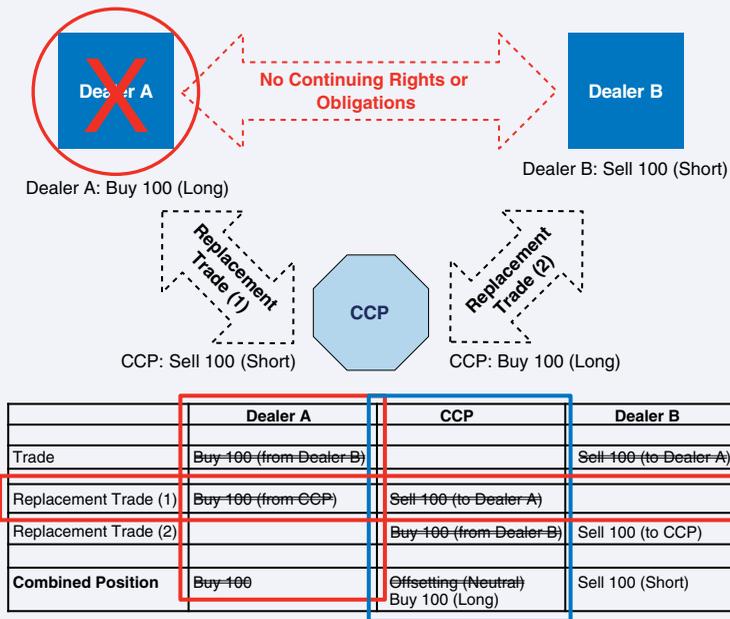
As a result, the bilateral connection that previously ran between Dealers A and B is broken and replaced by a pair of bilateral contract obligations that duplicate the economic position for which A and B originally contracted. The CCP’s risk position is neutral (or “balanced”) because it is both a buyer (from A) and a seller (to B) of the same underlying interest. However, like Dealer A in the bilateral transactions illustrated earlier, the CCP has credit exposure to both of its counterparties and an implicit credit chain runs through it. The CCP will explicitly recognize this risk exposure and take steps to manage it, such as imposing collateral requirements, fixing risk limits, and imposing other risk management requirements. Because the CCP becomes the substituted counterparty to all transactions submitted for clearing, moreover, it multilaterally nets open positions, thereby reducing margin requirements.

Of course, the possibility of counterparty default—and the associated credit risk—does not disappear from this sequence of transactions simply because the CCP has been interposed as common counterparty. In figure 9, I show the result if Dealer A fails to perform its obligations to the CCP.

In this situation, the CCP’s risk position—which had been neutral—becomes unbalanced because it remains a buyer (from Dealer B), even though Dealer A will no longer perform on the contract. The CCP also will have various resources at its disposal in the event of a member default.¹⁰

This brings us back to the place where we started, with a discussion of the intrinsic transactional opacity of counterparty relationships in the OTC derivatives market and the tendency of central counterparty clearing to simplify those relationships and make them more transparent—both to the traders themselves and to regulators. That tendency was reflected in figure 1.

But we should not exaggerate the benefits of central clearing arrangements. It is unquestionable that the transactional rights and duties of the counterparties to financial contracts that are cleared



Source: Federal Reserve Bank of Chicago.

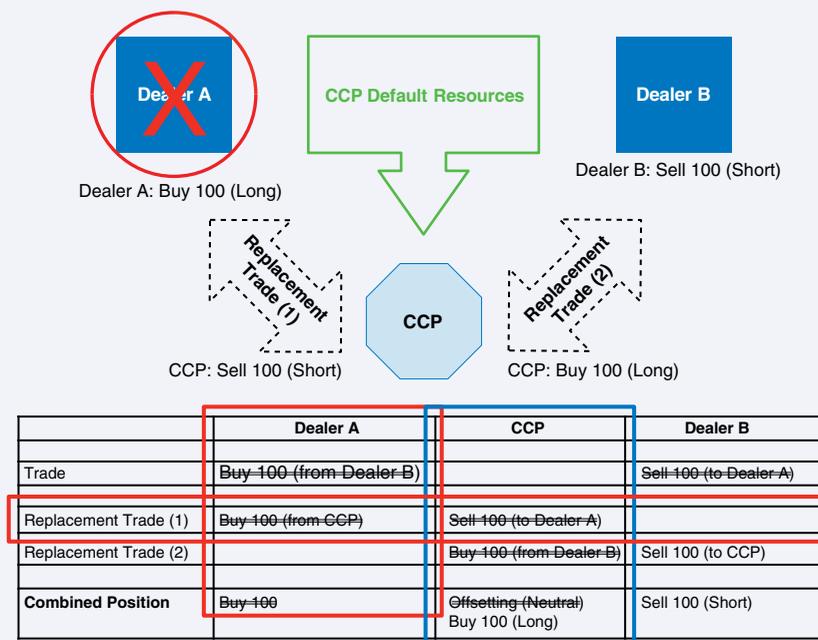
through a CCP become simplified and more transparent. But opacity is not banished completely by the operation of counterparty substitution. There are certain aspects of cleared markets that remain irreducibly opaque as shown in figures 11 and 12.

This illustration is based on the counterparty relationships described in the lower panel of figure 1. Here, I have added some additional clearing members of the CCP (designated here as members A, B, X, and Z).

In figure 12, I show that there may be any number of critical credit relationships between the CCP and these clearing participants.

For example, members A and B may be settlement banks for the CCP and its other members and, possibly in addition to that role, may act as backup liquidity providers to the CCP and other participants in the market. Members A and B may also have non-cleared credit relationships with others, including but not limited

10. Consequences of Default—CCP Financial Resources (Cleared Trade)



Source: Federal Reserve Bank of Chicago.

to, members X and Z; and these credit relationships, like the “credit chains” I described earlier, are completely opaque. So all that can be correctly said in relation to the transparency benefits of central clearing is that it reduces the opacity of counterparty relationships within a specific domain (e.g., the domain of direct exposures to over-the-counter [OTC] derivatives contracts), but it does not completely eliminate opacity. Indeed, central clearing does not completely eliminate risk or opacity.

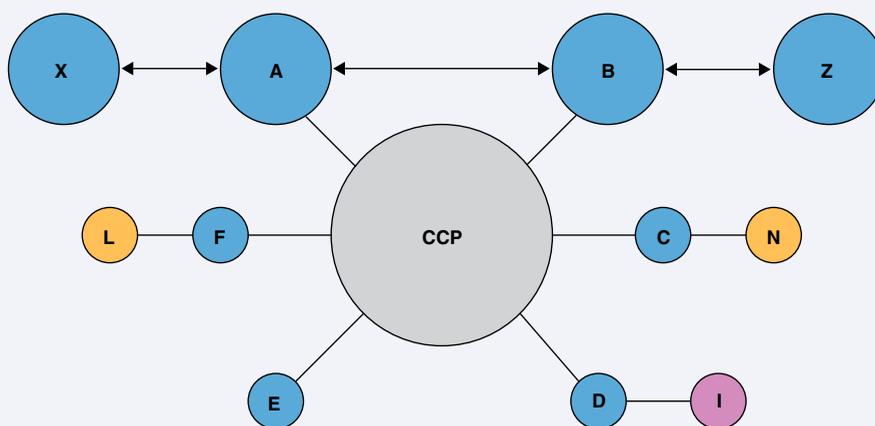
As pointed out in CPSS-IOSCO (2012):

A CCP has the potential to reduce its participants’ risks significantly by multilaterally netting trades and imposing *more-effective risk controls* on all participants.

Furthermore,

A CCP’s risk reduction mechanisms can also *reduce systemic risk* in the markets it serves depending on the effectiveness of the CCP’s risk controls and the adequacy of its financial resources.¹¹

11. Counterparty Relationships (Cleared Trades)



Source: Federal Reserve Bank of Chicago.

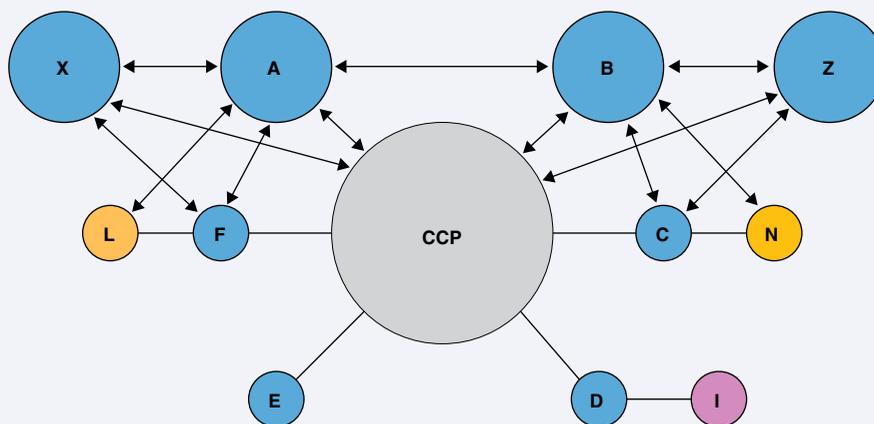
Nevertheless, the CPSS-IOSCO also recognizes that CCPs and other financial market infrastructures concentrate risk:

If not properly managed, [CCPs] can be sources of financial shocks, such as liquidity dislocations and credit losses, or ***a major channel through which these shocks are transmitted across domestic and international financial markets.***¹²

The “unambiguous benefits” of central counterparty clearing¹³ may justify the concentration of risk that results from clearing. But we should not ignore the costs that also result from central clearing. Looked at from a certain perspective, CCPs provide enhanced transparency for cleared financial contracts. Such transparency is beneficial, but it comes packaged in an institutional form that also contains undeniable and, perhaps, irreducible opacity.

Conclusion

In the recent financial crisis, CCPs performed their risk management and operational functions very well. However, some participants in OTC derivatives markets came under severe stress and some failed specifically because of risk management failures relating to



Source: Federal Reserve Bank of Chicago.

derivatives positions. As a consequence, the Group of Twenty (G-20) countries decided to make the central clearing of all standardized OTC derivatives mandatory and to impose higher capital requirements on non-cleared OTC derivatives. The central clearing mandate makes it critical for CCPs to be able to recover from severe financial stresses, such as the default of one or more clearing members. As many observers have noted, CCPs must now be “bulletproof” to avoid the propagation of systemic risk throughout the financial system. But CCPs have not always been bulletproof in the past, and it will be challenging for them to insulate themselves effectively against inherently unpredictable market shocks in the future.

This chapter has illustrated the core legal concepts and generally described the risk implications involved in counterparty substitution. For example, I have noted that the substitution of a CCP as the buyer to every seller and the seller to every buyer tends to align the CCP’s incentives with the interests of its clearing members. That is because counterparty substitution—whether supported by novation, open offer, or an equivalent legal mechanism—makes the CCP a principal to all trades it clears.

The CCP’s incentives, however, may not be exactly aligned with the objectives of public policy. Market regulation may be necessary to ensure that policy objectives are taken into account in the design and operation of CCPs. Regulation also may be necessary because of the moral hazard effects that arise from a perception that certain financial market institutions are “too big to fail” or “too interconnected to fail.” These issues remain fundamental to the establishment of sound policy relating to critical financial market infrastructures, such as central counterparty clearing arrangements.

Notes

¹CPSS-IOSCO (2012), p. 9, emphasis added.

²For a discussion of the development of central counterparty clearing arrangements, see, e.g., Norman (2011), Kroszner (1999), and Moser (1994; 1998).

³Garner (1995), p. 693.

⁴For a discussion of opacity and transparency in the OTC markets, see FSB (2010); Duffie, Li, and Lubke (2010); and Dudley (2012).

⁵Reserve Bank of Australia (2011), p. 12.

⁶CPSS-IOSCO (2012), p. 9 (emphasis added).

⁷As in the following illustrations, the underlying interest (commodity, security, rate, or other interest) is not relevant to the discussion and is, therefore, left unspecified.

⁸See, e.g., Garner (1995), p. 602.

⁹Bliss and Papathanassiou (2006), p. 19 (emphasis added).

¹⁰A discussion of CCP default management regimes and the legal and regulatory frameworks for CCP recovery and resolution is beyond the scope of this overview.

¹¹CPSS-IOSCO (2012), p. 155 (emphasis added).

¹²CPSS-IOSCO (2012), p. 5 (emphasis added).

¹³See, e.g., Shirakawa (2012), p. 3.

References

- Bliss, R. and C. Papathanassiou, 2006, "Derivatives clearing, central counterparties and novation: The economic implications," working paper, March 8, available at www.ecb.int/events/pdf/conferences/ccp/BlissPapathanassiou_final.pdf.
- Committee on Payment and Settlement Systems and Technical Committee of the International Organization of Securities Commissions (CPSS-IOSCO), 2012, *Principles for Financial Market Infrastructures*, April, available at www.bis.org/publ/cpss101a.pdf.
- Dudley, W., 2012, "Reforming the OTC Derivatives Market," remarks delivered at the Harvard Law School's Symposium on Building the Financial System of the 21st Century, Armonk, New York, March 22, available at www.newyorkfed.org/newsevents/speeches/2012/dud120322.html.
- Duffie, D., A. Li, and T. Lubke, 2010, "Policy perspectives on OTC derivatives market infrastructure," Federal Reserve Bank of New York, staff report, No. 424, January (revised March), available at www.newyorkfed.org/research/staff_reports/sr424.pdf.
- Garner, B., 2005, *A Dictionary of Modern Legal Usage*, Oxford: Oxford University Press, second edition.
- Group of Twenty, 2009, "Strengthening the International Financial Regulatory System," leaders' statement delivered at The Pittsburgh Summit, September 24–25, available at www.g20.org/documents/.
- Kroszner, R., 1999, "Can the financial markets privately regulate risk? The development of derivatives clearing houses and recent over-the-counter innovations," *Journal of Money, Credit and Banking*, August, pp. 569–618.
- Moser, J., 1998, "Contracting innovations and the evolution of clearing and settlement methods at futures exchanges," Federal Reserve Bank of Chicago, working paper, No. 98-26, available at www.chicagofed.org/digital_assets/publications/working_papers/1998/wp98_26.pdf.
- _____, 1994, "Origins of the modern exchange clearinghouse: A history of early clearing and settlement methods at futures exchanges," Federal Reserve Bank of Chicago, working paper, No. 94-3, April.
- Norman, P., 2011, *The Risk Controllers: Central Counterparty Clearing in Globalised Financial Markets*, Chichester: John Wiley & Sons.
- Reserve Bank of Australia, 2011, "Central clearing of OTC derivatives in Australia," June, available at www.rba.gov.au/publications/consultations/201106-otc-derivatives/central-clearing-otc-derivatives.html.
- Shirakawa, M., 2012, "Issues Facing the Futures Markets and the Industry," remarks delivered at the Japan Conference, hosted by the Futures Industry Association Japan, Tokyo, June 26, available at www.boj.or.jp/en/announcements/press/koen_2012/ko120726a.htm/.