

The Challenges of Derivatives CCP Interoperability Arrangements¹

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It has been posited that because central counterparties (CCPs) that clear European securities³ have established successful interoperability arrangements, European CCPs that clear derivatives contracts should be required to enter into similar interoperability arrangements. The premise is that doing so would potentially foster competition among derivatives CCPs and ideally, would tend to weaken the one to one relationship between a derivatives trading venue and its exclusive CCP. This paper challenges the plausibility of this concept on its daunting operational challenges rather than from a public policy perspective.

Interoperability among CCPs is distinctly different than public policy issues pertinent to open access. Open access clearing can best be described as the way that swaps are cleared after being executed on Swaps Execution Facilities (SEFs). The CCP destination is an attribute to the swaps displayed on the SEF trading screen. By listing the trade or by acting upon the trade as the aggressor, both buyer and seller are mutually agreeing to the selection of the CCP that will clear the swap for *both* parties. CCP interoperability allows buyer and seller to each designate a different CCP to clear their respective side of the trade, without notice to the market, i.e. CCP designation would not

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³ Technically, market participants exchange the “interest” in the equity security that the relevant European Central Securities Depository has in the equity security that it holds. That being said, these “interests” are nonetheless exchange traded, cleared and settled as though they were the actual underlying security.

necessarily be an attribute to the trade *ex ante*.⁴ CCP interoperability requires that CCPs become clearing members of each other. Over time, the exposures in these CCP interoperability relationships can become very significant.

Review of the Literature

Over the past decade in Europe, a regulatory framework to facilitate CCP interoperability has been developed and expanded to include an increasing number of products. In 2006, the European Code of Conduct for Clearing and Settlement established the right for market infrastructures to become members of another infrastructure, unless specific risk concerns have been identified. In 2012, the European Market Infrastructure Regulation (EMIR) established a regulatory framework for interoperability arrangements between CCPs; the current framework limits the scope of EMIR provisions on interoperability to transferable securities and money-market instruments. In 2015, the European Securities and Markets Authority (ESMA) recommended extending the EMIR provision to Exchange Traded Derivatives, a market in which one interoperability arrangement already exists, with a further extension to OTC Derivatives to be assessed at a later stage.

ESMA has issued Guidelines and Recommendations on CCP interoperability arrangements. These apply to all such arrangements, including those for OTC derivatives. The guidelines do not require a CCP to include its credit exposures to interoperable CCPs when sizing the default fund, but if this is the case, it must have other arrangements, like additional margin, in order to address the risks arising from interoperability.

In response to ESMA's Guidelines and Recommendations on CCP interoperability arrangements, the Bank of England (BoE) released a November 2014 report on their implementation.⁵ The BoE suggests that

⁴ It is not so in the Mutual Offset System in operation between SGX and the CME. That is, no party to an executed trade on SGX or CME knows if any portion of that trade is to be transferred to the opposite CCP.

⁵ "Implementation by the Bank of England of ESMA's Guidelines and Recommendations on CCP Interoperability Arrangements", November, 2014, Bank of England.

CCPs collect at least the amount of inter-CCP margin that would be normally collected in margin and DF contributions combined from a CM with the same positions. They note that any margin posted by one CCP to another CCP should be separate from and additional to the margins already collected by a CCP to cover its exposures to CMs. The BoE also argues that CCPs should include exposures to other CCPs in calculation of total pre-funded resources and that the Default Fund should be available to meet losses caused by the default of an interoperating CCP. In an effort to ensure that the exposures created by an interoperability agreement are not unduly shared by the uninvolved CMs of the CCPs, the BoE further suggests that any CCP that is a CM of another CCP should have its contribution to the Default Fund of the opposite CCP included in its initial margin requirement.⁶ Doing so ensures that the initial margin and the default fund contribution of a CCP remain at the very top of the default waterfall of the opposite CCP. The BoE does not think that CCPs should include interoperating CCPs within the scope of their loss allocation arrangements, but that they should consider steps to mitigate the impact of the default of an interoperating CCP. With respect to the risk standards applied to interoperable arrangements for derivatives, the BoE argues that they should be at least as stringent as the standards applied to interoperable arrangements for securities.

Respondents to the BoE implementation plan broadly agreed that CCPs should collect margin from interoperable CCPs equal to the initial margin and default fund contribution collected from a clearing member with the same positions and that it should be separate from and additional to the margins already collected by the CCP to cover its exposure to its own members. Respondents also largely agreed with BoE proposals that CCPs include exposures to interoperating CCPs when calculating losses in extreme but plausible conditions.

⁶ “Implementation by the Bank of England of ESMA’s Guidelines and Recommendations on CCP Interoperability Arrangements: Summary of Feedback Received and Policy Response”, July, 2015, Bank of England.

The literature on CCP interoperability suggests that there are benefits to such arrangements, but also makes clear that, in practice, the implementation of interoperability arrangements poses great challenges. McPartland (2003) discusses ways to implement open architecture clearing without violating “The First Law of Clearing” – that within a clearing system the number of long positions must always equal the number of short positions for the same instrument.⁷ McPartland notes that prior to 1984, there were firms that specialized in trading economically equivalent contracts between exchanges. These trades did not require any modifications in the clearing process; a position was closed on one exchange and then opened on another. In 1984, the Chicago Mercantile Exchange (CME) and the Singapore International Monetary Exchange (SIMEX) created the Mutual Offset System. This system allowed two clearing houses to balance long and short positions by maintaining reciprocal clearing member status with one another; CME could transfer one side of a trade to SIMEX and would balance its positions by taking out a mirror position with SIMEX. Open architecture clearing developed as the Mutual Offset System expanded beyond bilateral agreements. McPartland also highlights two potential public policy issues related to CCPs. First, they exhibit qualities of natural monopolies, with increasing returns to scale.⁸ Second, the use of pseudo-national clearing organizations by a wide range of international market participants could create a problem of moral hazard as the benefits would be enjoyed internationally, while the potential public costs would be faced largely by the CCP’s home country.

Garvin (2012) discusses benefits from interoperability including lowered costs to traders seeking to expand their product range or trading network, increased market competitiveness where multiple CCPs serve markets for the same product, and greater ease in undertaking anonymous

⁷ see McPartland, “Open Architecture Clearing” *Outlook '03*, Fall 2002, <https://secure.fia.org/downloads/Outlook/OpenArchitectureClearing.pdf>

⁸ The very largest clearing members could form their own CCP which had clearing membership criteria so high, that only a dozen or firms could join. The marginal cost of clearing of the restrictive CCP would be very low while the marginal cost of clearing for all other clearing members (with much lower clearing volume to cover expenses) would likely be uncompetitive.

transactions.⁹ However, he suggests that interoperability may also increase systemic risk by increasing the likelihood that stress at one CCP is transmitted to others. Garvin also notes that CCPs are less able to collect information on other CCPs than they are with clearing members, undermining their ability to monitor creditworthiness. Garvin highlights two ways to gain some of the benefits of interoperability without all of the complications it entails: first, cross-margining arrangements, where two CCPs discount collateral requirements to participants that use both CCPs at the same time and second, the other is mutual offset arrangements that allow participants to transfer positions between CCPs.

Mägerle and Nellen (2011) also find benefits to interoperability.¹⁰ They show that interoperability can help to resolve inefficiencies that result from a fragmented clearing system. They argue that by allowing traders to access multiple markets through one CCP, interoperability forces CCPs to compete with one another. However, they find that under current risk management models, interoperability is prone to undercollateralization and increased systemic risk. They argue that regulatory guidelines to combat this problem do so at the price of overcollateralization. They present two cross-CCP risk management models that reduce or eliminate the problem of undercollateralization without leading to the levels overcollateralization that result from the current regulatory guidelines: first, a scalable margin model, in which additional margin is requested when the sum of regular margins is insufficient to cover cross-CCP exposures, and second, a meta-CCP, a CCP for CCPs. They note that a meta-CCP may require harmonization of CCPs' risk management models in order to be practically feasible.

⁹ Nicholas Garvin, "Central Counterparty Interoperability", Quarter Bulletin, June, 2012, Reserve Bank of Australia. <http://www.rba.gov.au/publications/bulletin/2012/jun/pdf/bu-0612-7.pdf>

¹⁰ Jürg Mägerle and Thomas Nellen, "Interoperability between Central Counterparties", Swiss National Bank Working Papers, 2011-12, Swiss National Bank. http://www.snb.ch/n/mmr/reference/working_paper_2011_12/source/working_paper_2011_12.n.pdf

Clearing 101

The First Law of clearing is that longs must equal shorts at all times. This is particularly true of derivatives clearing where the unique phenomenon of open interest is present.¹¹ If longs were not equal to shorts, the determination of the open interest would be impossible and variation margin would not balance.

Thus, if a trade matched on an anonymous electronic trading venue and the parties to the trade directed their respective sides of the trade to clear at different CCPs, the two CCPs would have to have established an interoperability agreement between them. This means that they become clearing members of the other CCP. An example might be helpful.

Example

Clearing member A wants its short position to clear at CCP1 and clearing member B wants its long position to clear at CCP2. The location of the trading venues or CCPs is not material to this discussion. This can be accomplished with existing technology if and only if CCP1 and CCP2 are clearing members of each other. Because CCPs must always have equal long and short positions, at CCP1, clearing member A is short so the account of CCP2 at CCP1 must be long. Then at CCP2, clearing member B is long so CCP1 at CCP2 must be short. This is exactly the way that European securities settle at different CCPs and the way that the CME and SGX operate their Mutual Offset System.

That is where the similarities between clearing securities and clearing derivatives contracts end. Securities settle between the two CCPs on behalf of their respective clearing members, versus payment, and the securities go into custody, ending the totality of the transaction (in two business days). Futures and are subject to a mark to market revaluation at least once daily and are subject to an initial margin requirement to ensure financial

¹¹ Open interest refers to the number of open, or unliquidated derivatives contracts guaranteed by a CCP.

performance on the contract going forward.¹² Derivatives contracts can be liquidated by entering into an equal and opposite transaction as the transaction that opened the position. The totality of positions that remain open at the end of every business day is known as the open interest of that CCP. A high open interest indicates substantial commercial or speculative interest in the contract and is generally perceived to be a good indicator of future trading volume as most derivatives are offset by liquidation prior to maturity or delivery. A low open interest is generally viewed pejoratively as having less commercial appeal and may indicate a contract where liquidation by offset may be more challenging.

Returning to our example, the counterparty exposure that two CCPs have to each other to settle European securities lasts only two business days and is terminated upon the delivery versus payment settlement process adopted throughout western industrialized countries. Once the security is delivered versus payment, the seller gets paid and the buyer deposits the security into a custody account. There is no further processing, counterparty exposures or settlement risk

Securities CCPs versus Derivatives CCPs

The initiation or opening of a derivatives contract marks only the beginning of a protracted clearing and settlement process. In order to carry an open derivatives contract through time, market participants must deposit a good faith collateral deposit called initial margin. Initial margin for a given derivatives contract is set at a level that approximates an extreme but plausible one day¹³ market move for that instrument. By revaluing derivatives contracts at least once daily, the collateral value of the initial margin deposit is refreshed to its original value and the clearing member and

¹² See “Clearing and Settlement Demystified” Federal Reserve Bank of Chicago, *Chicago Fed Letter*, No.210, January, 2005. Republished in the June, 2005 Edition of Futures & Derivatives Law Report.

¹³ The so called “margin period of risk” may be greater than one day in some regulatory jurisdictions.

the CCP have *ex ante* collateral that could be looked to, to ensure financial performance for at least another clearing cycle.

Initial margin levels are set in conjunction with a presumptive liquidation period.¹⁴ If a CCP sets its initial margin levels to cover a one day extreme but plausible market move, it must be confident that the open positions of clearing members are not so concentrated that it would likely take more than one day to liquidate those positions. There are exceptions, and as fewer and fewer trade intermediary Futures Commission Merchants (FCMs) remain in the business to clear and settle derivatives transactions on behalf of clients, the open interest has increasingly become concentrated among the top ten FCMs. From time to time, the margining systems of the relevant CCPs detect that the size and concentration of open positions at some FCMs exceed the presumptive liquidation period upon which initial margin levels were determined. For example, given the average daily trading volume of West Texas Intermediate Crude Oil (WTI) a CCP that clears WTI can determine with some confidence, how many WTI contracts it could reasonably expect to liquidate in the open market before the worst liquidating price received exceeded the amount of initial margin held *ex ante*. At times, concentrated portfolios can exceed these boundaries and the margining systems of today's modern CCPs recalibrate the estimated liquidation period for such concentrated portfolios. As the presumptive liquidation period becomes longer, the amount of initial margin required to protect the CCP from a potential liquidation loss becomes concomitantly larger.¹⁵ This augmented initial margin requirement is often referred to as concentration margin or super margins.

¹⁴ This is often referred to as the Margin Period of Risk.

¹⁵ For the majority of derivatives contracts where it can be shown that risk is distributed normally, the appropriate initial margin requirement is approximated by multiplying the standard initial margin requirement by the square root of the number of days in the presumptive liquidation period.

CCP Interoperability

As more and more market participants avail themselves of the ability to direct their derivatives contracts to be cleared at the CCP of their choice, independent of the CCP choice of the counterparty to the trade, the balancing positions in the CCPs' open interests with each other will become larger and larger. The open positions of CCP1 at CCP2 will be exactly the opposite of the open positions of CCP2 at CCP1. The magnitude of the open interest of these mirror image portfolios will approximate the cumulative number of unliquidated derivatives trades executed where market participants selected different CCPs. At some point, the magnitude of these correspondent open positions between the CCPs will exceed the prudential presumptive liquidation period for the derivatives contracts in the CCPs' portfolios. As the extended presumptive liquidation period for these large portfolios between CCPs is calculated, the margining systems of the CCPs then calculate the additional initial margin that would be required to cover the extended presumptive liquidation period. As we will see with the examples that follow, when one CCP requests concentration margin from the other CCP, the logical and equitable financial resources for obtaining this concentration margin become slim to none.

Potential Sources of Concentration Margin

From an equitability perspective, one potential way for CCPs to fund concentration margins with each other would be for the actual parties to the trade that created a CCP interoperability trade to be required to fund the concentration margins associated with such a trade. In an effort to alert a market participant to the potential that they might be called upon to help fund the concentration margins of their CCP, the anonymous trading venues would have to indicate on the trading screen (prior to trade match) that one or more of the parties involved in this trade wants their side of the trade to clear at a different CCP and thus, could potentially give rise to an additive concentration margin requirement.

This approach fails in at least two exemplars. Notwithstanding that a CCP's open interest with the other CCP would require prudential concentration margins, the market participant that just executed the marginal derivatives contract may not be concentrated at all with its own CCP. That is, it would be counterintuitive at best for a CCP to request concentration margins from one of its own clearing members if that clearing member has no concentrated portfolios of positions with its "home" CCP. Posit that the open interest in WTI futures contracts between CCPs exceeds 100,000 (and would require concentration margins) and the market participant that just entered the market bought only five futures contracts (for a new open interest of 100,005 contracts). The CCP would need to ask the new market entrant for concentration margins for only five contracts when there would be no logical justification for requesting concentration margin as five contracts does not begin to pose a concentration issue at that CCP.

Posit that it is reasonable that the new market participant had received proper notification (on the trading screen) of the potential for concentration margins before they agreed to execute the trade and that the lack of a position concentration between the new market participant and its home CCP is not grounds to refuse to meet a demand for concentration margins. Assume the new market entrant has indeed paid the concentration margin even though their only open position is (long) five contracts.

The following day, the "new" market participant that had purchased five futures contracts the prior day (and posted concentration margin on those five futures contracts) sells (liquidates) their five contracts to a new buyer that clears their contracts at the same CCP as the new market entrant. The open interest between CCPs remains unchanged at 100,005. Since both market participants clear their derivatives contracts at the same CCP, there would have been no warning on the screen that there was a potential for concentration margins because that trade execution did not have any CCP interoperability characteristics. That being said, the local CCP is now short five contracts to the new buyer (its clearing member who had nothing to do

with a CCP interoperability transaction) and still long 100,005 contracts with the other CCP.

In sum, even indicating on the trading screen that there is the potential for having to post concentration margin on a position simply will not work, as there can be no assurance that the original market participant will not trade out of that position and be substituted by another local market participant that was not a party to an interoperability transaction.

The Rock and the Hard Place

Those that would still advocate CCP interoperability arrangements among derivatives CCPs would have difficult choices to make. This paper argues (1) concentrated positions should be subject to concentration initial margin requirements that anticipate an extended presumptive liquidation period and (2) there is no logical or equitable funding source for interoperable CCPs to fund a concentration initial margin obligation. The alternative would to exempt interoperable CCPs from concentration initial margin obligations.

The Principals for Financial Market Infrastructures¹⁶ (PFMI) clearly states in Principal 6: Margin,

A CCP should adopt initial margin models and parameters that are risk-based and generate margin requirements sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default.

[and]

The model should (a) use a conservative estimate of the time horizons for the effective hedging or close out of the particular types of products cleared by the CCP (including in stressed market conditions)...

¹⁶ “Principals for Financial Market Infrastructures”, Committee on Payment and Settlement Systems and Technical Committee of the International Organization of Securities Commissions, Bank for International Settlements, April, 2012, pp. 50-53.

Any reasonable interpretation of PFMI Principal 6 would be that any concentrated portfolio of open positions that has a presumptive liquidation period exceeding the presumptive liquidation period upon which initial margin is determined, should be subject to a concentration initial margin obligation. If two or more derivatives CCPs entered into interoperability agreements, it is logical to assume that the CCPs would become the largest clearing members to each other and one of the very first clearing members to be subject to a concentration initial margin obligation.

Conclusion

There appears to be little to no room for interoperable CCPs to ignore PFMI Principal 6 and not post concentration initial margin with each other.

In the immediately preceding section, we show that there is no logical or equitable funding source for a CCP to obtain the assets to satisfy a concentration initial margin obligation. In this paper, we limited the discussion to one pair of derivatives CCPs. The complexity of attempting to inaugurate interoperability agreements among three or more CCPs would increase dramatically. If derivatives CCP interoperability can easily be shown as unworkable between a pair of CCPs, it is only logical that it would be completely unrealistic among three, four or more CCPs where there would be an interoperability agreement established between all pairs of CCPs.

Therefore, those that continue to proffer that derivatives CCPs should be forced to establish interoperability agreements among themselves to foster competition among CCPs should understand the prudential requirements placed upon CCPs by the Principals of Financial Market Infrastructures, including prudential margining regimes, and either offer plausible funding sources for the concomitant concentration initial margin obligations or cease advocating the impossible in public.