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Key Observations

1. Central counterparties (CCPs) provide derivative markets with benefits of multilateral netting and better collateralization, assurances of trade finality and settlement, and help bolster the market integrity.
2. Strengthening CCPs is a necessary but hardly sufficient condition to ensure financial system stability. Macroprudential policy should supplement the work of CCPs with attentive monitoring and rapid resolution procedures:
    - Market liquidity conditions must be monitored vigilantly to ensure effective price discovery and market continuity. Regulators and supervisors must stand ready to support illiquid financial intermediaries if CCPs and markets threaten to seize.
    - A fast and certain recovery and resolution procedure of a failed CCP is essential. It would facilitate the CCP's recapitalization and its ability to resume its function within the financial system.

Introduction

Central counterparties (CCPs) play a pivotal role in the post-crisis reforms of derivative market trading, especially for over-the-counter (OTC) derivatives. By stepping into the middle of trades, a CCP becomes "the buyer to every seller and seller to every buyer," providing several benefits to market participants and promoting financial stability via multilateral netting and centralized default management.[2]

Since the reform, CCPs have become an indispensable part of the infrastructure for derivative trading. Around 75 percent of swaps are now cleared through clearinghouses, compared with just 15 percent before the 2007-2009 financial crisis.[3] Such an increase in the concentration of trading exposure led regulators and market participants to worry about the resilience of CCPs to systemic shocks. The first regulatory reaction was to designate the largest CCPs as systemically important financial market utilities (SIFMUs), and to develop stress tests to evaluate their robustness and identify vulnerabilities. Furthermore, a default

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[2] See Heckinger et al. (2013) for more details on CCPs.
[3] See Domanski, Gambacorta and Picillo (2015).

waterfall—a cascade of risk-mutualization backstops— is being designed to minimize the risk and the impact of a CCP member's failure.

Despite their critical role in ensuring trades, regulators may become over-reliant on CCPs to safeguard the financial system. This note highlights some commonly held misconceptions and overly-complacent conclusions about CCPs' ability to stabilize financial markets, especially in the presence of systemic shocks. The current framework has been successful in reducing bilateral counterparty risk and securing CCPs' ability to clear securities trading. Yet, still missing is a full assessment of the consequences of CCP operations on other segments of the financial ecosystem, apart from their impact on derivatives trading.

Strengthening CCPs is a necessary but hardly sufficient condition to ensure financial system stability. In a post-crisis environment that is still reformulating and issuing new regulations, macroprudential regulators should be mindful of policies aimed at improving CCP functioning, inducing unintended consequences. Policymakers should also evaluate the potential for CCP margin requirements to be pro-cyclical, especially as CCP members become more interconnected among themselves and with other parts of the financial system. Policies that impose added responsibilities to CCPs may tax their ability to raise additional capital or liquidity during stressed market conditions. It is vital that in implementing new policies, assessments include how changes in CCP and market behavior affect third parties. Indeed, the new policies may induce undesirable and destabilizing system-wide behaviors.

Proactive measures by supervisors and regulators are needed to supplement the enhanced role of CCPs and related changes to other parts of the financial infrastructure. Despite the potential for CCPs to ensure that derivative markets function smoothly, vigilant oversight by the public sector over systemically important functions of CCPs may still be needed to ensure the continuity of the trading system. Regulators and supervisors need to monitor market liquidity conditions, ensure effective price discovery, and stand ready to support illiquid financial intermediaries if CCPs and markets threaten to seize.

The remainder of the note briefly summarizes the role of CCPs and their benefits before identifying some key issues that will shape macroprudential policymaking going forward.

Central Counterparties' Benefits in Dealing with Risk

By strengthening the integrity of the clearing process when market participants engage in trading activities, CCPs help ensure that each trade will be cleared and settled. With CCPs, we would expect benefits that include the following:

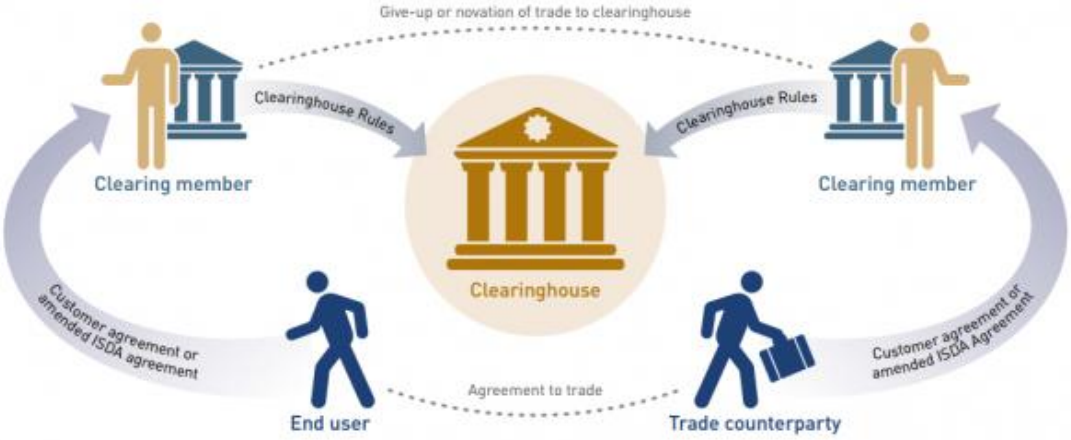
- ***Reducing counterparty risk in all cleared contracts***—the CCP serves as a substitute counterparty and becomes the sole principal for each counterparty. As a result, the CCP takes market participants' trading exposures onto its own balance sheet, relieving the counterparties of multilateral risk exposures.
- ***Multilateral netting***—CCP members are required to post both initial margin (IM) and variation margin (VM).[4] As the sole principal, the CCP can offset these payment obligations across multiple

[4] Margins are in the form of cash or other acceptable collateral such as treasuries or agency securities. The amount of initial margin required is based mainly on the clearing member's portfolio risk components and remains constant for a given portfolio allocation. Variation margin is marked-to-market to reflect revaluation of positions and is calculated on a daily basis.

clearing members, only requesting their net amount. These netted obligations are generally much smaller, and acceptable collateral for margin requirements usually consists of high quality and liquid assets. Consequently, this multilateral netting process releases assets for participants to use elsewhere.

- ***Centralized risk management***—by centralizing the margining process and collecting enough collateral, the CCP incorporates a sophisticated risk management system that contains the exposures arising from trading positions.
- ***Transparency and better price information***—the CCP has a well-informed price discovery mechanism based on a large number of derivatives trades. It also enhances system-wide price transparency by aggregating standardized data and making it available to other parts of the market.

FIGURE 1. Centralized Clearing Substitutes the Clearinghouse as One of the Parties in Each Trade



Source: Milken Institute (2014).

With their enhanced importance in the financial system, CCPs, and, more specifically their resilience became a major concern for market participants and for regulators. Accordingly, regulators have required the largest CCPs to follow a three-step assessment process. First, a systemically important CCP is identified and designated as a systemically important market utility (SIFMU). Second, the CCP is required to implement stress testing and the results are evaluated by the regulator. And third, the CCP must design a plan for recovery and orderly resolution. The stress tests are intended to detect vulnerabilities and improve the CCP's risk management, including required levels of capital and margin. The recovery and resolution planning helps to ensure the continuity of the trading system through a well-defined waterfall in the case of a default of a CCP member.[5]

This waterfall, as described in Table 1, is a multi-layer line of defense to contain losses if a counterparty defaults. It starts with the defaulter's prefunded resources, such as margins and default fund contributions. If these are not enough to cover the losses, the CCP can draw from its own capital and other members' contributions to the default fund. Once these are exhausted, the CCP may call pre-agreed unfunded

[5] BIS and IOSCO (2016) provide guidance on how to implement the principles for financial market infrastructures for CCPs.

resources from non-defaulting members.[6] Finally, if these prove insufficient, the CCP would have access to other loss absorption tools, such as variation margin gain haircuts, that are applied not only to its members, but also to their clients.

The backstopping afforded by multiple layers of loss-absorption embedded in the waterfall is designed to make the CCP and its trading system more resilient in the event of a member's default. However, it is important to note that enhancing the resilience of CCPs is a necessary but far from sufficient condition to ensure financial system stability, especially in time of systemic stress. The following section broadens our analysis to include system-wide considerations.

TABLE 1. CCP's Waterfall

Resources	Affected Parties	Layers of Protection
Prefunded	Defaulting member	1—Initial margins, 2— Guarantee fund
	CCP	3— CCP's Capital
	Non-Defaulting members	4— Guaranty fund
Pre-agreed Unfunded	Non-Defaulting Members	5— Assessments
Other	Non-Defaulting Members Investors/Dealers	6— Variation Margin Haircutting/Initial Margin Haircutting

Source: Based on OFR (2017).

CCPs Have Spillover Effects that May Detract from Financial Stability

Macroprudential policy aims to mitigate risk to the financial system as a whole. Yet, most of the macroprudential assessment of new CCP regulations evaluate the individual CCP's resilience in isolation, without considering potential spillovers this new rule may have on the rest of the financial system. In other words, market participants' trading behavior and changes in their risk profile associated with mandatory central clearing for standardized OTC derivatives tend to be overlooked. That is because they may affect parts of the financial system outside derivative trading, and often considered to be outside the purview of CCP regulators and supervisors.

However, ignoring such spillovers may led to overly optimistic expectation when it comes to CCPs' ability to alleviate pressure on the financial system, especially in time of financial distress. We believe supervisors and regulators should implement procedures to supplement the work of CCPs, especially around three specific dimensions: pro-cyclicality of margin requirements; additional interconnections induced by CCPs among members and counterparties; and third-party exposures.

[6] Other ex-ante funding arrangements with insurance companies exist. Insurance services for clearinghouses can be underwritten through schemes such as GCSA, a US-based consortium of 20 insurance companies.

Pro-Cyclicality of Mark-to-Market Margin Requirements Reduce Market Liquidity

More collateral to adequately pre-fund CCPs may reduce leverage in derivatives markets, but such required additions may worsen liquidity conditions elsewhere. Margin requirements may have destabilizing feedback effects in times of market distress: under these conditions, meeting margin requirements implies raising more collateral at a time when market conditions are already illiquid. This induces *a pro-cyclical excess demand for liquid funds at a time when liquidity is scarce.*[7] More frequent trades cleared through a small number of CCPs using similar margining methods may exacerbate such phenomena.[8]

Interconnections Induced by CCPs May Strain Banks' Ability to Meet Other Obligations

Variation margin dynamics can further impair funding liquidity: margin calls are marked-to-market and vary daily. They call for more collateral when asset values are declining. The ability to meet margin requirements depends strongly on the extension of credit by clearing members, as they usually fund margin calls for their clients.[9] *In a period of extreme financial market stress, CCP members' need to extend credit competes with their obligation to provide collateral in the event of counterparty defaults, as mandated by the clearinghouse itself.*

These competing interests and obligations may place extra pressure on clearing members at the worst time because defaults often occur during, or can even be induced by, widespread illiquid conditions. Moreover, CCP members are mostly banks that are also the main liquidity providers for the rest of the financial system. Consequently, pro-cyclical margining and their CCP member responsibilities have the potential to hinder banks' ability to lend to other parts of the financial system, especially in times of already contracted liquidity supply.[10]

Unanticipated Third-Parties' Exposure to CCP Failure May Worsen Market Conditions

The increasing systemic importance of CCPs raises questions about the balance between increasing capital to bolster CCPs' resilience to large shocks, and ensuring that CCPs have adequate resolution plans. When the backstop provided by the CCP waterfall is no longer credible, current CCP procedures imply the possibility of broadening the base for the CCP to raise funds to third parties (e.g., end users who are not CCP members). This view regards end-user balance sheets to be a public good that can (and should) be used to bolster a failing CCP in times of financial market stress. This is because the CCP is thought to provide such firms services and assurances of trade finality when market conditions are normal.

[7] Brunnermeier and Pedersen (2009) argue that margin requirements dictate lower margins when the market is liquid and volatility is low and higher margins during high volatility and illiquid market conditions.
[8] Park and Abruzzo (2016) show that a margin model based on value-at-risk methodologies may understate the risk in normal conditions and amplify them in time of stress. Most large CCPs use these models. OFR (2017) provides an analysis of clearing members' concentration.
[9] Banks provide credit lines to their clients in order to meet their variable margin obligations on a daily basis during the lifetime of the contract. Variable margins are mostly cash payments.
[10] Pirrong (2014) provides several illustrations for this point.

Furthermore, under the Dodd-Frank legislation, the recovery and resolution procedure for SIFMUs relies on discretionary behavior of a regulatory body (e.g., the FDIC), which decides on the criteria and procedures for reorganizing a failed institution. Such procedures include the arbitrary reallocation of credits and losses of the failed institution among its creditors, guided by the desire to ensure overall financial stability and the viability of the new entity.

However, such discretion under Dodd-Frank resolution procedures increases uncertainty, and may induce market behaviors among non-CCP members (end users) that worsen financial stability. Unlike clearing members, end investors do not have a contractual relationship with the CCP beyond the finality of the trade for which the CCP is a counterparty. Without assurances of finality under a resolution process, third parties may want to sell their derivative holdings as soon as possible if the CCP's viability is questioned or if the waterfall is likely to be triggered.

The risks described in this section highlight the difference between micro- and macro-prudential policy: the former controls the risks within intermediaries while the latter looks at the impact one financial institution imposes on other institutions and markets. A broader mandate for CCPs may appear to improve micro- and macro-prudential conditions, but they may not reduce systemic risk because of unintended consequences of policies aimed at ensuring a CCP's survival. Such policies may be more destabilizing than swift and certain recovery and resolution procedures that restore market functioning quickly.

Concluding Remarks: CCPs Have Limitations and Need Additional Macroprudential Policies to Assure Financial Stability

In their function as a sole principal for derivatives trades, CCPs provide several benefits—multilateral netting, collateralization, and collective loss mitigation. They also enhance transparency (in derivative markets) and encourage standardized derivative contracts.

While CCPs ensure related trades are settled and paid, it is less certain that the policies to improve their viability always strengthen overall financial stability. Indeed, many of the channels of risk transmission between CCPs and the financial system—direct and indirect—remain to be identified, following the changes induced by the new regulation requiring CCPs for derivative trading.

It is extremely difficult to evaluate the impact on the overall financial stability of a stronger mandate for, or expanded use of CCPs. Studies focusing on financial stability usually attempt to assess macroprudential policy changes holistically, often with a succession of "what if" scenarios due to the complexity of the financial system.[11] In contrast, most derivatives-centric analyses overlook the potential for spillovers from CCP operations and member obligations to affect other segments of the financial ecosystem.

In this note, we highlighted three dimensions of CCP operations that have undeniable potential to challenge overly optimistic expectations, especially in times of generalized financial distress: pro-cyclicality of CCP margin requirements; additional interconnections induced by CCPs among members and counterparties; and third-party exposures.

[11] See Financial Stability Report (2016).

While addressing all of these risks may not be feasible, pursuing the following regulatory initiatives will be essential in mitigating their impact:

- ***Pro-cyclicality of margins***—the CPSS-IOSCO Principles for Financial Market Infrastructure require margin models to not be "overly" pro-cyclical. The CFTC Risk Management Subcommittee suggests mitigating this risk by easing the financial burdens, where possible, for members who provide those margins during bad times. [12,13] While still very much a work in progress, some reforms, such as these, are needed to address the "pro-cyclicality problem."
- ***Funding liquidity markets***—in the event of a member's default, CCPs face immediate liquidity risks. Although many CCPs have arranged liquidity facilities, there is an element of "wrong-way risk" if the defaulting member is part of the liquidity facility.[14] Furthermore, the issue may not be inadequate margin collateral but the inability for the CCP to provide timely payment to surviving clearing members, especially in presence of systemic liquidity issues. [15] Consequently, when there is widespread financial distress, the central bank should step up to meet its obligation as the "lender of last resort" and provide liquidity to CCPs —either directly or indirectly via CPP members, i.e. banks.
- ***Resolution process***—a fast and certain recovery and resolution procedure of a failed CCP is essential. It would facilitate the CCP's recapitalization and its ability to resume its function within the financial system. The Financial Institutions Bankruptcy Act of 2017, passed by the House, is a step in the right direction as it provides a set of clear and transparent rules to follow.

Finally, clearing performs best when the financial products being cleared are traded in deep and liquid markets, and with standardized contracts. Expanding the current centralized framework that features CCPs to trading in complex and illiquid non-standardized OTC derivatives may lead CCPs to take on risks that they cannot safely manage, or that require CCP members to provide unaffordable levels of collateral or liquidity.[16] This is another example where reducing risk (and possibly leverage) in one market (in this case, OTC derivatives) may not automatically improve overall system-wide financial stability.

[12] In order to reduce the burden, they also recommend allowing the non-defaulting members to rely on the defaulting members' assessment of their customers, known as "Know-Your-Customer" (KYC) practice, when servicing defaulting member's portfolios.
[13] CCP Risk Management Subcommittee Final Recommendations (2016) suggest a "temporary relief from capital requirements for the non-defaulting clearing member could help alleviate the risk of the trades and collateral moving at different times making portability more likely."
[14] That is, the exposure to a counterparty is not independent from the credit quality of that counterparty but is negatively correlated, based on the International Swaps and Derivatives Association (ISDA)'s definition.
[15] Cox and Steigerwald (2017) discuss this point.
[16] In February 2017, however, the CFTC delayed the implementation of its Dodd-Frank variation margin (VM) rules that require financial counterparties to collateralize mark-to-market exposure to over-the-counter (OTC) derivatives that are not centrally cleared by a registered clearinghouse.

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