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CHAPTER 8
Rethinking the Swaps Clearing Mandate

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The remaking of the United States derivatives markets is among the most celebrated pieces of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank).[1] These regulatory reforms have unnecessarily destabilized the financial markets through mandatory reliance on central counterparties (CCPs).[2] CCPs are financial institutions that collect derivatives transactions from many market participants and manage the associated risks. We outline a better approach that would not include a central clearing mandate or the associated trading mandate and instead would allow the derivatives markets to develop through voluntary—not regulatory—mechanisms. Combined with principles-based regulation for CCPs and robust regulatory reporting, an organically developed market structure would enable the derivatives markets to mitigate risk—including through the voluntary use of CCPs—without undermining financial stability.

*For the article on which this chapter is based, see Hester Peirce, "Derivatives Clearinghouses: Clearing the Way to Failure," *Cleveland State Law Review* 61 (June 2016): 589–660.

OTC DERIVATIVES, CLEARING, AND THE NEW REGULATORY FRAMEWORK

Derivatives are financial contracts that derive their value from the price of something else, such as a commodity, stock, bond, index, or currency. These contracts—which include futures, forwards, swaps, and options—enable companies and individuals to shift risks to parties willing to bear that risk. Derivative contracts can last for weeks, months, or even years. Financial and nonfinancial companies use derivatives to manage a wide array of risks, including foreign exchange risk, interest rate risk, and counterparty risk. Another important role derivatives play is price discovery and liquidity: derivatives provide information about the products or financial instruments on which they are based and can improve liquidity in the markets for those products or financial instruments.[3]

Many derivatives trade on exchanges and are cleared through CCPs, which are often affiliated with the exchange.[4] These derivatives adhere to a standard set of terms governing each aspect of the contract. Derivatives also can be executed off-exchange in a bilateral transaction between a dealer (usually a large bank)[5] and another dealer or customer. These bilateral transactions—also known as over-the-counter (OTC) derivatives—afford substantial flexibility in contract terms to accommodate the customer's unique needs.[6] Many OTC derivatives are interest rate derivatives,[7] which allow firms, for example, to exchange a floating interest rate for a fixed interest rate. OTC derivatives are sometimes called swaps "because many OTC deals involve cash flows, or obligations, that are swapped or exchanged between two parties at defined intervals."[8] Parties to these OTC derivatives generally have not cleared them through CCPs.

In the United States, voluntarily established clearinghouses have long served the equities, options, futures, and fixed income markets.[9] Clearinghouses match, confirm the terms of, net, and settle executed trades.[10] Of particular importance for this chapter, once a trade is executed, a clearinghouse that serves as a CCP steps in as buyer for every seller and as seller for every buyer. To protect itself and its members, the CCP collects contributions to a guaranty fund and collateral (also known as margin)[11] from each clearinghouse member.[12] If a party defaults and losses exceed the collateral provided by that party, remaining losses are allocated according to a preset default waterfall.[13]

Dodd-Frank proffers mandatory central clearing as necessary to bring order to the large OTC derivatives markets. By forcing OTC derivatives into central clearing, Dodd-Frank purportedly reduces systemic risk; big financial

institutions' exposures to one another are limited and replaced with exposures to CCPs. Advocates also point to the value of central clearing in enhancing transparency, introducing margin uniformity and discipline, mutualizing losses, and limiting the need for market participants to monitor one another.[14] Importantly, CCPs also can help to contain the consequences of a failure by a large financial firm.[15]

In addition to implementing central clearing mandates, Dodd-Frank directs regulators—the US Commodity Futures Trading Commission (CFTC), US Securities and Exchange Commission (SEC), the Board of Governors of the Federal Reserve System (Federal Reserve), and other banking regulators—to impose margin, trading, reporting, registration, risk management, and business conduct requirements on swaps markets. Dodd-Frank changes are rooted in an international postcrisis effort to impose a new, more formal regulatory structure on the OTC derivatives markets, which had previously not been subject to the same degree of regulation as, for example, the futures markets.[16]

The Dodd-Frank swaps framework includes several key features. First, it identifies the major market participants (i.e., "swap dealers" and "major swap participants"),[17] requires them to register with the CFTC or SEC,[18] and subjects them to certain business conduct requirements.[19] Second, Dodd-Frank requires the CFTC and SEC to identify OTC derivatives or categories that are subject to a clearing mandate.[20] In making these determinations, the agencies must consider factors such as market size and liquidity, the availability of pricing data, swap infrastructure adequacy, systemic risk considerations, competitive considerations, and legal certainty.[21] Third, Dodd-Frank mandates that these swaps—except for those involving nonfinancial companies hedging their business risks—be cleared at clearinghouses registered with the SEC or CFTC.[22] Fourth, if a trading venue is available, cleared swaps must trade on an exchange or a swap execution facility (SEF)—a new type of trading venue created by Dodd-Frank for the swaps markets.[23] Fifth, Dodd-Frank rules prescribe how, when, and by whom cleared and uncleared swap transactions must be reported to a swap data repository, another new registered entity created under Dodd-Frank to house swap transaction data.[24] Sixth, Dodd-Frank requires public transparency about swap transactions.[25] Seventh, the Act requires regulators to set capital and margin requirements in connection with cleared and uncleared swaps.[26]

The final component of the regulatory framework is focused on safeguarding the CCPs that play such a central role in Dodd-Frank. Ben Bernanke, the

former Federal Reserve chairman, put it this way: "As Mark Twain's character Pudd'nhead Wilson once opined, if you put all your eggs in one basket, you better watch that basket."[27] Titles VII and VIII of Dodd-Frank, which address numerous aspects of CCPs, facilitate efforts to "watch the basket." OTC derivatives clearinghouses must register with either the CFTC as a derivatives clearing organization (DCO)[28] or the SEC as a clearing agency.[29] The statute allows the CFTC and SEC to exempt from registration CCPs that are supervised by the other commission or a foreign regulator.[30] Dodd-Frank builds on the existing regulatory framework for the DCOs and clearing agencies that existed before Dodd-Frank to clear exchange-traded derivatives and securities. The Act modifies the regulatory structure for CCPs in a number of ways. First, Congress authorizes the CFTC and SEC to write tailored rules for swaps CCPs.[31] Second, the statute directs the commissions to write rules governing conflicts of interest at CCPs if "necessary or appropriate to improve the governance of, or to mitigate systemic risk, promote competition, or mitigate conflicts of interest."[32] Third, Title VII prescribes an "open access" model for swaps CCPs pursuant to which they must accept swaps for clearing, regardless of where the transactions are executed.[33] Fourth, Title VII includes a modified and expanded set of "core principles" for DCOs.[34]

The final component of Dodd-Frank's changes for CCPs is in Title VIII of the legislation, which posits a more stringent regulatory regime for CCPs designated to be currently or potentially systemically important by the Financial Stability Oversight Council (FSOC).[35] Title VIII charges the SEC and CFTC with writing and enforcing heightened risk management standards for designated CCPs and gives the Federal Reserve a backup regulatory role.[36] The Act requires cooperation among the CFTC, SEC, and the Federal Reserve in developing a joint risk management supervisory framework for designated CCPs.[37] CCP standards must cover a number of specific risk management areas, including margin and default procedures, but the statute allows the regulators wide latitude to write standards covering other areas.[38] A designated CCP must seek preapproval from its regulator for changes in rules, procedures, and operations that would "materially affect the nature or level of risks presented by" the CCP.[39]

US CCP regulation draws heavily from international standards. These global standards predate the financial crisis,[40] but—as Dodd-Frank notes—have been "evolving" since the crisis.[41] Most significant among the postcrisis efforts is the revised set of standards for financial market infrastructures,

including CCPs, issued in 2012 by the Committee on Payment and Settlement Systems (CPSS)—subsequently renamed the Committee on Payments and Market Infrastructures (CPMI)—and the International Organization of Securities Commissions (IOSCO).[42] Drawing the appropriate balance between safety of and access to CCPs is a key theme of the CPSS/IOSCO standards. Covered areas include governance, credit and liquidity risk management, access, transparency, and default management.

As the length and breadth of the international standards illustrate, CCP risk management is a complex undertaking. Inserting regulators deeply into that exercise further complicates risk management. The next section discusses this and other problems with the existing regulatory framework.

PROBLEMS WITH THE CURRENT REGULATORY FRAMEWORK

Together, the clearing mandate, the regulatory influences on the design and operation of CCPs, and the implicit government backstop threaten to destabilize CCPs, individual firms' risk management, and the broader financial system. As Professor Craig Pirrong has warned, "a wholesale re-engineering of the structure of derivatives markets via legislative fiat is fraught with danger."[43] There are a number of concerns associated with the new framework.

Expanded CCPs Could Destabilize the Financial System

CCPs, expanded pursuant to the clearing mandate, could pose a risk to the broader financial system. By nature, CCPs are deeply interconnected with large financial companies and potentially with other CCPs. They have direct relationships with clearing members and settlement banks, which tend to be large firms. They have indirect relationships with clearing members' customers, which also may be large financial firms. These interconnections are channels through which problems could be transmitted across the financial system.

CCPs function by making and receiving payments according to a strict timeline. This feature normally protects the CCP and its members, but may cause problems during a crisis. In addition to the initial margin that a CCP collects in connection with a transaction to protect against future price movements, the CCP collects variation margin from, and credits it to, the accounts of its counterparties in response to price changes throughout the life of the

derivatives contract. Paying on time is important to ensure that clearing members to whom payments are due are able to meet their obligations to other parties.[44] CCPs typically collect variation margin daily, but, to protect themselves during times of market stress, CCPs are likely to make multiple and perhaps large collateral calls in a single day.[45] Mark Roe points out that because "the collateral available to one creditor, namely the clearinghouse, is value denied to other creditors," the CCP may not serve to reduce systemic risk.[46] Knott and Mills note that a CCP's protective margin calls could cause members "to sell assets in a second market, driving down prices there."[47] They further explain that if margin payments are delayed, "the CCP may redistribute part of its risk to liquidity providers such as banks."[48] Pirrong cites the potential for CCPs to shift risk from derivatives counterparties to other creditors of failed firms, increase borrowing to meet margin requirements, create large demands for liquid assets during times of great stress, and impose losses on firms through the default fund at times when those firms can least bear them.[49]

Further complicating matters, clearing members are likely to be large financial institutions that play multiple roles and have multiple relationships with each CCP. Only a small number of firms are clearing members.[50] Clearing members may themselves be, or may be affiliated with, the settlement banks or the providers of lines of credit on which CCPs rely.[51] Prearranged lines of credit might not materialize during a crisis, particularly if the lending bank is a stressed clearing member.[52] Federal Reserve Governor Jerome Powell points out that "the failure of a large clearing member that is also a key service provider could disrupt the smooth and efficient operation of one or multiple CCPs, and vice versa."[53] The CCP has to consider the full scope of its relationship with clearing members when, for example, it forecasts the effects of a member default or a margin call or assessment on surviving members.[54]

The 1987 stock market crash illustrated how closely CCPs are tied to the banking system, how important payment timing is, how serious the ramifications of operational issues can be, and how CCPs interact with the financial system during a crisis.[55] Ben Bernanke, who studied the incident, concluded that the clearing and settlement system suffered from "malfunctions of communications and information processing systems" and "financial gridlock as banks and other creditors became cautious about transferring funds to individuals or institutions whose solvency might be in doubt."[56] These fears seemed to have helped to drive prices down.[57] Bernanke further notes that

clearinghouses' margin calls "were widely criticized in postmortems for 'draining liquidity from the system.' "[58] Federal Reserve intervention kept the system functioning through the 1987 crisis.[59] Since 1987, systems have improved,[60] but real concerns remain about how expanded CCPs would function in the face of similar market stress. Because of new liquidity rules after the most recent crisis, liquid assets will be at even more of a premium than they were in 1987.[61]

Default management also might be difficult in the Dodd-Frank world of stricter capital standards and mandatory clearing. Capital requirements may prevent nondefaulting clearing members from taking on the defaulter's client's portfolios.[62] Particularly if the defaulter's portfolio contains unusual products, the CCP may have trouble borrowing trading personnel with the requisite knowledge of the products from nondefaulting members to manage the defaulter's portfolio.[63]

A further complication is that multiple CCPs may be competing for the same liquid assets, personnel, capacity of clearing members to take on additional positions from defaulters' portfolios, and perhaps even capacity of clearing members to replenish guaranty funds or meet unfunded assessments. If one CCP were affected, others would likely also be affected.[64]

If a CCP stopped meeting its obligations altogether, it could greatly impede markets. A CCP that cannot meet its payment obligations could stop the markets for which it clears from functioning.[65] Because CCPs tend to dominate particular markets, there might not be a substitute CCP, so the market for any OTC derivatives cleared at the failing CCP and subject to the clearing mandate would lock up.[66] Adding to the disruption, the status of existing contracts at a failing CCP would also be uncertain.[67]

During a crisis, CCPs operating in an environment of clearing mandates may aggravate, rather than mitigate, problems in the financial system. As the next section describes, even during normal times, a CCP may have unintended adverse effects on risk management in the financial system.

Clearing Mandate Could Undermine Risk Management *Outside* the CCP

Dodd-Frank's clearing mandate affects the way firms manage their business risks and exposures to other firms. Some of these changes may be positive, but

others may disrupt existing bilateral relationships and may result in risks being borne by parties not well equipped to bear them.

Bilateral transactions are often part of a larger customer relationship between a company and a dealer bank. That relationship may include unique collateral arrangements (e.g., not having to post collateral below a certain threshold or being permitted to post illiquid assets as collateral). Forcing swaps into CCPs, which cannot replicate these accommodations, will disrupt these bilateral relationships. Both clearing members and their customers will have to post collateral in the liquid form demanded by CCPs.[68] Customers may enter into new relationships to borrow collateral. If banks meet the demand by lending liquid assets to their customers to post as collateral, "the tail risk may not leave their books," as central clearing proponents hoped it would.[69]

Nonstandardized, bilateral agreements enable companies to manage their risks with a greater precision than they can with standardized products. The clearing mandate and associated disincentives to use uncleared swaps—such as higher margin requirements for uncleared swaps, capital charges, and anti-evasion provisions—may discourage firms from dealing in and using uncleared swaps. Risks may go unhedged as firms forgo derivatives-based hedging altogether or use a less tailored cleared product to imperfectly hedge their risk.[70] Alternatively, Columbia University scholar Ilya Beylin argues that market participants seeking to avoid the clearing mandate could resort to more complicated, less transparent, and riskier transactions.[71]

Mandatory clearing undercuts the ability of firms to engage in bilateral netting—the process by which dealers are able to net their exposures to one another. Although CCPs facilitate multilateral netting, bilateral netting opportunities with a particular counterparty decrease if some transactions with that counterparty are moved to a CCP.[72]

Mandated Central Clearing Could Impair Counterparty Monitoring

One of the main functions of a CCP is to eliminate the need for a buyer of a derivatives contract to monitor the seller, and vice versa. Buyers and sellers planning to centrally clear can be indifferent about the identity of their counterparty.[73] Loss is mutualized and risk management is centralized by CCPs. As a consequence, less interdealer monitoring will take place than it did prior to the clearing mandate.[74] CCPs pool risks, which means that there is still

an incentive for each member to conduct some monitoring to avoid having to cover a portion of the losses from a defaulting member.[75] The clearing mandate tempers those incentives by forcing participation in the CCP and limiting members in their ability to influence CCP access and risk management rules.

CCPs have certain risk management advantages. They offer centralized risk management by requiring clearing members to meet certain threshold requirements and contribute to a guaranty fund that can be tapped if a member defaults.[76] CCPs monitor their members and may impose risk-specific restrictions on them—including position limits—to prevent being overexposed to any particular firm.[77] CCPs may be able to monitor risk more thoroughly than a single dealer could since CCPs have broad access to information about clearing members and their positions.[78] Pirrong has argued, however, that CCPs have lower quality information than the hedge funds and banks that "specialize precisely in understanding risks and pricing . . . especially . . . for more complex and novel derivative instruments."[79] CCP staff may have a broader view of a member's portfolio, but they may not be able to fully understand the risks of the portfolio since they do not have the expertise of the individuals who trade particular products daily.

The clearing mandate could incentivize firms to enter into transactions that they otherwise would avoid, because they know the attendant risks will be the CCP's. Former British central banker Paul Tucker makes the point that "firms using a CCP have incentives to take more counterparty credit risk in their market transactions than otherwise, discriminating less when choosing with whom to trade because their credit exposure is not to their market counterparty but rather to the clearing house—unless the tail risk is credibly mutualized."[80] Efforts to increase the CCP's share of the losses in the event of a member default could exacerbate the problem of clearing members' offloading risk—intentionally or carelessly—to CCPs.[81]

CCPs are generally very reliable counterparties, but firms have to consider the possibility that something could go wrong. If a CCP member defaults, the other members may bear some of the losses, but how much a particular firm will bear is difficult to estimate in advance. To enable more precise modeling of their exposure to CCPs, clearing members are pushing for greater *ex ante* clarity about what will happen if a CCP runs into trouble.[82] Members also have an interest in strong risk management, but the clearing mandate undercuts

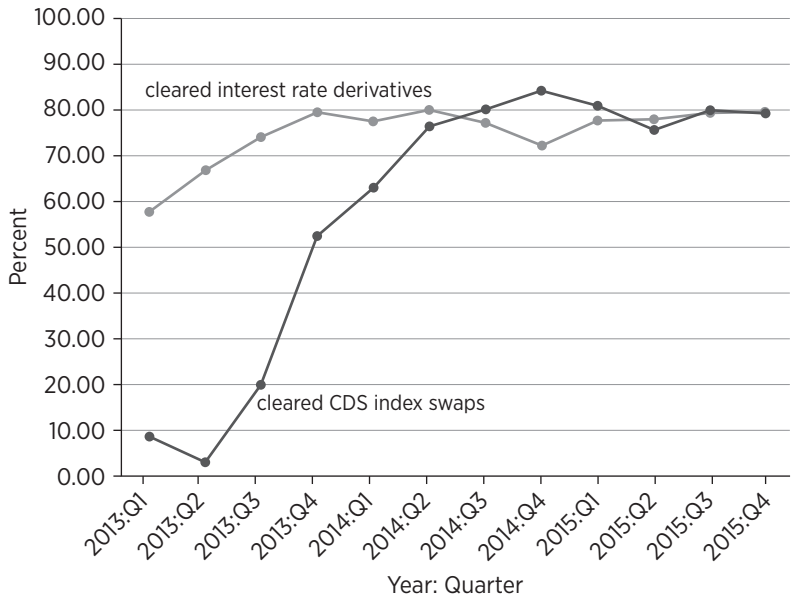
clearing members' leverage by making it hard to eschew doing business with a poorly managed CCP that clears a product subject to the mandate. Incentives to monitor CCPs and choose carefully which ones to use may be further hampered by Dodd-Frank's practice of assigning the right to select a CCP to the nondealer party to a transaction—the party with the least incentive to monitor the CCP.[83] Assessing and managing exposure to CCPs may be particularly difficult because, as the next sections discuss, regulatory developments are changing CCPs.

Mandated Clearing Could Force Improper Risks into CCPs

The clearing mandate, when combined with other regulatory and economic pressures, encourages CCPs to open their doors to more products in higher volumes than they would have absent the mandate. Carefully choosing products for clearing is an important way that CCPs protect themselves.[84] Considerations include how a product's prices have moved over time, how the product might interact with other products cleared by the CCP, and how those interactions might change in response to market developments. As figure 1 shows, cleared volumes have risen markedly in recent years. Some of the newly cleared products have features that make risk management difficult. An international body focused on CCP risk management explained in modifying its recommendations for OTC derivative CCPs: "because of the complex risk characteristics and market design of OTC derivatives products, clearing them safely and efficiently through a CCP presents unique challenges that clearing listed or cash-market products may not."[85] Manmohan Singh similarly warns that "pushing CCPs to clear riskier and less-liquid financial instruments, as the regulators are now demanding, may increase systemic risk and the probability of a bailout."[86] Today's CCPs, therefore, must grapple with new risks.

The risks associated with certain types of swaps are particularly difficult to manage. Single-name credit default swap (CDS) contracts, for example, present a jump-to-default risk that makes them more difficult to properly margin than standard interest rate contracts.[87] A portfolio of swaps may behave unremarkably during normal market conditions, but may be prone to unanticipated, dramatic price moves.[88] Liquidity may fluctuate during a swap's lifetime.[89] Interproduct correlations are also not constant over time.[90] CCPs' margin models—developed for more standardized, highly liquid derivatives—may

Figure 1. US Central Clearing Market Share of Interest Rate Derivatives and CDS Index Swaps, 2013–2015



Source: Financial Stability Oversight Council, "FSOC 2016 Annual Report Data," June 21, 2016, https://www.treasury.gov/initiatives/fsoc/studies-reports/Pages/2016-Annual-Report.aspx.

Note: FSOC uses SwapInfo (ISDA) data.

not properly accommodate the unique features of these new products and their correlations with other products.[91]

In deciding which products to clear and how to margin them, CCPs also must be alert to changes in correlations among cleared products and clearing members:

> [R]isk may be amplified due to a correlation among risk factors. For example, a CCP clearing CDS could experience a "double default" where a reference entity defaults and a CCP's participant defaults simultaneously because the participant had a large short position (i.e., sold credit protections) in the reference entity or where the credit risk of a reference entity and that of a participant with a large

> short position are highly correlated. In another scenario, a defaulting participant with a short position may turn out to be the reference entity (self-referencing CDS).[92]

Dodd-Frank acknowledges that the clearing mandate is not appropriate for all OTC derivatives. The statute directs regulators, in deciding whether to impose a clearing mandate on a swap or a group of swaps, to consider a number of factors including "the existence of significant outstanding notional exposures, trading liquidity, and adequate pricing data" and operational and legal frameworks.[93] However, other statutory factors—systemic risk mitigation and competitive implications[94]—give regulators a nudge to opt *for* a clearing mandate, even if there are concerns about inadequate liquidity or pricing data.[95]

Strong commercial, financial, and competitive incentives intensify pressure to extend clearing mandates to additional categories of swaps. CCPs seeking to expand their businesses[96] and market participants chafing under dealers' tight control of the bilateral markets might favor extended clearing mandates. Mandated central clearing brings with it new profit opportunities for firms that do not have large bank balance sheets and therefore may not have been attractive counterparties in the bilateral context. Users of CCPs may also encourage broader clearing mandates as expanded CCPs offer multilateral netting, which can reduce collateral demands.[97]

Regulatory advantages to clearing bolster the market impetus for broad central clearing mandates. Among these advantages are potential margin savings because margin requirements on uncleared swaps are intended to be more stringent than they would be in the cleared context.[98] Basel capital rules also offer favorable capital treatment for swaps cleared through a CCP that meets international standards—a qualifying CCP.[99] Uncleared OTC derivatives also carry legal and reputational risk as Dodd-Frank requires the SEC and CFTC to take steps to prevent "evasion of the mandatory clearing requirements."[100]

Regulatory Conflicts of Interest Could Impair CCP Risk Management

CCPs, as originally conceived, brought together a group of members that voluntarily pooled and cooperatively managed risks. The new model replaces voluntary cooperative efforts with regulatory mandates. That regulatory involvement not only brings new risks into CCPs, it complicates risk management.

Because of the important place CCPs have in the government-made OTC market structure and the implicit government backstop, it is not surprising that many policymakers and academics call for intense regulation of CCPs.[101] A counter-concern is that such regulation may be guided by objectives other than sound risk management.

First, regulators may be moved by factors other than risk management in setting guidelines for membership standards—a key risk management feature of CCPs. Membership rules have stability implications; a broad membership distributes "the costs of default across a greater number of members,"[102] but a homogeneous, robust membership may generate more stable CCPs.[103] Membership rules also have competitive implications because a firm that does not meet the minimum requirements must clear through a member (or through a member's client) or forgo trading in swaps subject to a clearing mandate.[104] The CFTC claims to allow DCOs "discretion to balance restrictions on participation with legitimate risk management concerns" because they are "in the best position in the first instance to determine the optimal balance."[105] Yet it specifically prohibits DCOs from setting "a limit on the number of market participants that may become clearing members,"[106] setting more than a $50 million minimum capital requirement for membership,[107] and requiring "members to post a minimum amount of liquid margin or default guarantee contributions, or to participate in a liquidity facility."[108] These decisions highlight what Professor Jo Braithwaite refers to as "the membership dilemma" created by "regulators having framed compulsory legislation around a private sector legal device designed to mutualise losses for selected participants."[109] As Professor Hal Scott explains, "A clearinghouse is just an association, so it's only as strong as the member firms. If you were hell-bent on fairness, and opened this thing to everybody, that would increase the risk to the clearinghouse."[110]

Second, the mandated use of CCPs has given them a quasi-public character in regulators' eyes, which introduces competing interests in CCP governance. Economist Norbert Michel points out that Dodd-Frank's classification of CCPs as financial market utilities "marks a dangerous shift in the relationship between government and private markets because it implies that private financial firms cannot—or should not—competitively provide financial services."[111] The CPSS/IOSCO principles, which heavily inform US regulation, emphasize the responsibility of financial market infrastructures to "support the stability of the broader financial system, other relevant public interest considerations, and

the objectives of relevant stakeholders"[112] and call for governance to balance the interests of a CCP's owners, board of directors, managers, clearing members, regulators, and "other stakeholders."[113] Directing CCPs—in the nebulous name of public interest—to serve multiple constituencies with potentially conflicting objectives may have the perverse effect of destabilizing CCPs and the financial system. CCPs that are run with a member-focus are more likely to elevate risk management than CCPs required to consider a host of other constituencies (such as regulators and other nonmember "stakeholders") who do not face the prospect of absorbing CCP losses.

Third, regulators face pressure to view purported risk management measures as the product of competitive machinations by dealers. In a comment letter to the CFTC, the Department of Justice worried that anticompetitive behavior in connection with CCP access "could be explained away . . . by expressing risk management–related concerns" and urged the CFTC to adopt stricter conflict of interest standards for CCPs.[114] This view may cause regulators to disallow legitimate risk management measures. It also helps to drive calls for governance and ownership restrictions on CCPs intended to limit the influence of clearing members and other large financial firms on clearinghouse management. Many observers favor replacing or supplementing dealer influence in governance and risk management with public interest and regulatory representation.[115] Under Dodd-Frank's conflict of interest mandates, the SEC and CFTC have contemplated individual and aggregate ownership caps and independent director involvement in governance to temper clearing member influence.[116]

Fourth, regulators may be tempted to employ one-size-fits-all regulations that distract CCPs from conducting their own tailored risk management and may prevent them from responding effectively to problems as they arise. Stress tests are one area in which this concern exists. Although calling for "[m]ore standardized stress tests" across jurisdictions,[117] former CFTC Commissioner Mark Wetjen, warned that "[w]hile standardization and uniformity are appealing, they could inadvertently impede innovation and thoroughness. Would we start to teach to the test instead of evaluating and refining the stress test methodologies as appropriate?"[118]

Fifth, a prescriptive regulatory regime applicable to a small number of firms with a vital role in the financial system seems fertile ground for regulatory capture.[119] Economist George Stigler warned that "as a rule, regulation is acquired by industry and is designed and operated primarily for its benefit."[120]

There are a small number of CCPs, and Dodd-Frank legally mandates that they be used. There are also relatively few large firms that serve as clearing members. Although the new regulatory framework is burdensome for these firms, CCPs and clearing members could seek to use these burdens to their advantage in blocking entry by domestic and foreign rivals. Alternatively, the Shadow Financial Regulatory Committee suggested that CCPs could "exploit opportunities for regulatory arbitrage and regulatory capture to lessen the costs of government oversight."[121] Moreover, CCPs are likely to put pressure on regulators to dissuade the use of noncleared derivatives, which can serve as substitutes for cleared products. The authority of multiple regulators in this space might make regulatory capture more difficult, but divided regulatory authority brings its own challenges.

Sixth, conflicts among regulators could exacerbate risk by adding complexity to CCP management. The SEC and CFTC directly regulate CCPs, and the Federal Reserve plays a backup role under Title VIII of Dodd-Frank. The approaches taken by these agencies are not always consistent, in part because of historical differences in the way the agencies have overseen CCPs.[122] There have also been calls for the involvement of the FSOC in CCP regulation.[123] Moreover, despite the common G20 commitment to central clearing, global regulators have had difficulty working together in overseeing this international market, and the lack of coordination could worsen during a crisis as regulators strive to keep assets in CCPs within their jurisdiction.[124] As clearing mandates take hold around the world, the pressure for linkages among CCPs is likely to grow,[125] which will only further complicate regulatory oversight.

Finally, the desire to increase the proportion of swaps that is cleared is likely to affect regulators' oversight of key risk management decisions. As discussed earlier, a pro-clearing outlook may color determinations to impose a clearing mandate. More subtly, a desire to make clearing more attractive could affect decisions related to how much margin is collected, the form margin may take, and how it is invested. If margins are set improperly, the CCP may be at risk.[126] There is not a widely accepted formula for setting margin, and there is a lot of room for nonrisk considerations to affect regulators' views on margin methodologies.[127] Consequences of regulatory mistakes may not manifest themselves until a crisis. Similarly, on questions related to CCP default management, regulators may favor the approach that imposes the least additional

immediate cost on clearing services, even if that approach misaligns market participants' incentives and lays the groundwork for problems should a member later default.

Mandated Clearing Risk Could Increase Bailout Risk

In an era of clearing mandates, a shuttered CCP could devastate markets as market participants must centrally clear transactions subject to the clearing mandate. If clearing members could not prop up a CCP, presumably the government that imposes the clearing mandate and supervises CCPs would go to great lengths to keep the troubled CCP in operation. If regulators have acquiesced in or encouraged CCP under-margining, inadequate guaranty funds, or some other risk management misstep, they are particularly likely to be pressured to bail out a failing CCP. If problems emanate from products under a clearing mandate, regulators will likewise face bailout pressure. If only one CCP clears a product, that pressure will be particularly intense.[128]

The likely availability of government support for a failing CCP is reflected in Dodd-Frank in two ways. First, the Orderly Liquidation Authority in Title II, Dodd-Frank's alternative to bankruptcy for large financial institutions, does not explicitly apply to CCPs; whether a CCP could be resolved under Title II is an open question.[129] The absence of a resolution mechanism could be interpreted as leaving open the door for a government bailout. Second, Title VIII gives the Federal Reserve authority to loan money through the discount window to systemically important CCPs in "unusual or exigent circumstances."[130] Dodd-Frank also allows the Federal Reserve to establish accounts for systemically important CCPs and provide services to them, such as currency and coin services, check clearing and collection services, wire transfer services, automated clearinghouse services, settlement services, securities safekeeping services, and Federal Reserve float.[131] The Federal Reserve could use these powers to conduct a bailout.[132] Despite messages to the contrary,[133] the availability of emergency lending could encourage carelessness by both CCPs and regulators.[134]

A possible rejoinder to the concern about bailouts is that CCPs rarely fail. There have been failures, however, and today's more complex CCPs—reshaped by clearing mandates and attendant regulation—are not immune from failure.

Past failures include the French Caisse de Liquidation in 1974, the Kuala Lumpur Commodity Clearing House in 1983, and the Hong Kong Futures Exchange Clearing Corp. in 1987.[135] In each case, the problem related to margin.[136] Brazil's BM&F CCP almost failed in 1999 when there was inadequate margin after a currency devaluation caused two clearing members to default.[137] In December 2013, a Korean CCP dipped into its guaranty fund after one of its members—a small broker-dealer—defaulted because of a trading error.[138] Problems at CCPs emerge quickly and come with a high price tag—precisely the conditions on which government bailouts are built.

A BETTER APPROACH TO MANAGING RISK

To achieve greater financial stability and serve financial markets and the broader economy effectively, the current top-down regulatory framework for OTC derivatives needs to be replaced with a regulatory approach that leaves clearing decisions and the consequences of those decisions in the private sector. The new structure would not include clearing mandates or associated trading mandates. Provisions designating CCPs systemically important and providing them access to Federal Reserve backstops would likewise not be part of the new structure. The replacement framework would instead allow market participants to choose central clearing and would substitute a principles-based regulatory approach for the current, increasingly prescriptive approach to CCP regulation. A comprehensive reporting regime for cleared and uncleared swaps would ensure that firms and their regulators have better insight into where derivatives exposures are than they did in the last crisis.

Elimination of the Clearing Mandate

The first step toward enhancing financial stability would be to eliminate the clearing mandate. Admittedly, doing so would be a stark departure from one of Dodd-Frank's core features. On the other hand, as noted earlier, the Act recognizes that clearing is not always appropriate. Dodd-Frank embraced the clearing mandate to shore up financial stability, but there is a growing realization that clearing is not unambiguously positive for stability. To effectively eliminate the mandate, capital and margin incentives to clear also would have to be

eliminated. The clearing mandate and associated regulatory nudges impede market participants' ability to make choices that are both consistent with strong risk management and serve customer needs. As attorney Paul McBride points out, much can be done with "voluntary, rather than compulsory clearing, [which enables] market participants . . . to exercise discretion in order to strike the optimal balance between the costs and benefits of clearing."[139] Eliminating the mandate would also ease concerns that a failing CCP would lock up markets since market participants would be able to continue transacting in uncleared products without running afoul of the clearing mandate.

It is likely that CCPs would continue to clear many of the swaps that they currently clear and add new products to meet organic market demand for central clearing. Even before Dodd-Frank's clearing mandate was put in place, some OTC derivatives, in response to market demand, were centrally cleared.[140] Affording market participants the ability to choose whether to clear would allow them to avoid, or use their leverage to improve, poorly managed CCPs. In the current model, once a mandate is in place, CCPs have a government-granted privilege. A mandate-less model would give CCPs an incentive to earn customer business by managing risk well.[141]

The trading mandate, which was established by Dodd-Frank as a companion of the clearing mandate, is likewise unnecessary. Market participants will choose how and where to trade based on a wide variety of considerations that they are best positioned to balance. The swap execution facilities called into life by Dodd-Frank would continue to exist, if they meet organic market demand.

Principles-Based Regulation

Eliminating the clearing mandate would not obviate the need for regulatory oversight of CCPs. The regulatory regime, however, should be principles-based. Primary responsibility for designing and running CCPs should remain with the owners and members. A prescriptive regulatory regime inappropriately shifts this responsibility to regulators by placing the full array of risk management decisions in their hands. A principles-based regulatory regime would allow CCPs broad discretion to operate in the manner that best suits the products they clear and the market participants they serve. Within this

framework, CCPs would have the room to make swift changes to operational, technical, or risk management procedures as weaknesses emerge, risks are better understood, or available technology improves. CCPs are self-regulatory organizations, which means that—subject to oversight by the CFTC or SEC—they are able to write and enforce rules applicable to their members. In line with the approach used by the CFTC, CCPs could be permitted to self-certify to their regulator that each new rule complies with the principles.

To allow CCPs sufficient discretion, core principles should be broad, not prescriptive. Increasingly prescriptive regulation can have the perverse effect of frustrating effective and adaptive CCP risk management, dulling clearing-member monitoring of CCPs, and homogenizing CCPs so that all are subject to similar vulnerabilities. As former Federal Reserve Governor Randall Kroszner explained, "More intense government regulation of CCPs may prove counterproductive if it creates moral hazard or impedes the ability of CCPs to develop new approaches to risk management."[142] The CPSS/IOSCO risk management principles and other relevant standards can inform the core principles and CCPs' compliance with those principles. To facilitate member monitoring, CCPs would need to disclose policies governing topics including member obligations, the complete default waterfall, risk management, governance, resolution and recovery procedures, and margin methodologies, as many CCPs already do in their rulebooks.

Regulators could continue to monitor CCPs for improper practices. Pirrong has called for regulators to be able to revise membership requirements if the regulators "can show that they were adopted for anti-competitive reasons, or place an undue burden on competition not justified by any prudential benefit."[143] This principle makes sense applied more broadly to other CCP risk management and operational measures.

To augment regulatory oversight of CCPs, CCPs could obtain private insurance[144] or issue convertible bonds. Although these options require further analysis, they could supplement the monitoring provided by regulators and members.

Properly Aligned CCP Ownership and Governance

CCPs are most likely to serve the public interest of promoting financial stability if their ownership and governance structures correspond to economic

interests. Randall Kroszner has explained that "market forces can produce private regulations that address the concerns about safety, soundness, and broader financial stability."[145] As traditionally constructed, clearinghouses were a group of financial firms that pooled certain risks, managed them jointly, and shared any losses. Risk management is an essential ingredient of such an arrangement.[146] CCP control restrictions of the sort contemplated by Dodd-Frank that would prohibit such an arrangement may have the unintended consequence of undermining the proper functioning of incentives for risk management.[147] As a result of demutualization, today's CCPs tend not to be member-owned; most CCPs are affiliated with an exchange.[148] Clearing members, however, continue to be the primary loss-bearers when they fail. Consequently, as others have argued, clearing members must play a role in designing risk controls for, and managing, CCPs.[149] Regulations should accommodate and encourage active member involvement in CCP oversight.

Although the mutual ownership CCP model is attractive for financial stability reasons, the for-profit model that dominates the swaps landscape would more effectively contribute to stability if the clearing mandate were eliminated. CCPs would no longer have an essentially guaranteed stream of business, which would give market participants more leverage to influence CCP risk management practices. Members will be reluctant to use a CCP that exposes them to large or difficult-to-estimate risk. Now the only option for clearing members concerned about poor CCP risk management is to cease trading products subject to clearing mandates.

The suggestion that members with money on the line in the default fund must play a central role in risk management runs directly counter to the recommendations of others who worry about the undue control that dealers exercise in CCPs.[150] These commentators worry that, if permitted, large dealers will limit entry to CCPs and prevent them from accepting products for clearing to keep products in the more profitable (for dealers) bilateral market.[151] Some call for ownership and governance restrictions of the sort permitted by Dodd-Frank and proposed by the SEC and CFTC.[152] Some advocate replacing the voices of clearing members with those of public interest directors in risk management and other key committees or securing a place for regulatory representatives on CCP boards.[153] Concerns about dealer control of CCPs are understandable in light of their dominant role

in these markets, but attempts to readjust the power dynamics at CCPs may unintentionally destabilize them. Regulatory principles should encourage the involvement of properly incentivized, knowledgeable experts in CCP management and oversight.

Prohibitions against anticompetitive activity modeled on existing statutory prohibitions should suffice to prevent CCPs from being used for improper competitive purposes. For example, DCOs are prohibited from making rules and taking actions that restrain trade or impede competition unless the DCO has a statutorily legitimate reason for doing so.[154] As noted earlier, regulators could have the authority to abrogate CCP rules or other actions upon demonstrating that the action was being undertaken for anticompetitive reasons rather than to bolster the soundness of the CCP.[155] The task of identifying inappropriate, anticompetitive behavior is best left to the functional regulators, rather than to the realm of antitrust law.[156]

No Implicit or Explicit Promises of Bailouts

Regulatory changes to end bailout expectations would support financial stability. As Kroszner explains, "a promise of government financial support in the event of a risk-management failure" can "eviscerate . . . private-market discipline, which has served private and public interests in the stability of CCP arrangements so well for so long."[157] Restoring private discipline requires eliminating explicit and implicit government guarantees on CCPs.

Central to eliminating government guarantees is ending the FSOC's power to designate systemically important financial market utilities under Title VIII of Dodd-Frank and related provisions. The designation carries with it an implicit message that the government will not let designated entities fail. Designated CCPs have access to Federal Reserve accounts and services, which could allow the Federal Reserve to prop up a failing CCP in a future crisis.

The elimination of the clearing mandate also would help to send the message that the government is not a CCP guarantor. As long as the government requires market participants to use CCPs, market participants will anticipate that the government will step in to keep a failing CCP operating to ensure that transactions subject to the mandate and cleared solely by that CCP would not cease.

A final way to build private discipline is to encourage private-sector efforts involving CCPs and their members to define CCPs' default waterfalls clearly, realistically explore tail risks, and plan for recapitalization and resolution in the event of failure due to defaults or nondefault problems (e.g., operational issues).[158] Although current conversations about these issues have been spurred by the increase in clearing brought about by the clearing mandate, they are valuable in the absence of a mandate. Credible plans by CCPs to deal with failures in risk management or operational systems are a critical part of eliminating implicit expectations of government bailouts.

Regulatory Reporting

One of the concerns during the last crisis was that neither regulators nor market participants had a good picture of the OTC derivatives market. CCPs provide a discipline that prevents the buildup of the backlogs that plagued pre-crisis markets,[159] but a reporting regime could do the same thing. A new regulatory regime would not only provide regulators the information they need to monitor the derivatives markets, but would ensure that market participants are aware of their exposures to CCPs and other counterparties.

Elements of Dodd-Frank's reporting regime achieve these objectives. Under the Act, market participants report swap transactions to a swap data repository (SDR) or to the SEC or CFTC.[160] The SDR collects and confirms trade details and stores trade data for regulators to access. SDRs could be retained for these purposes.[161] Requiring that transactions be reported as soon as reasonably possible would help to avoid the buildup of backlogs of unconfirmed transactions. Dodd-Frank specifies which entities possess the reporting obligation, but under a new framework, this determination could be part of contractual negotiations.

Even if regulators have timely and comprehensive access to information about the OTC derivatives markets, policymakers should not assume that regulators will identify and preemptively solve emerging problems in those markets.[162] As with other areas, markets are more agile at gathering, analyzing, and reacting to information than regulators are, particularly if market participants bear the consequences of their own decisions. The recognition of regulators' limits underlies a regulatory framework that leaves risk management decisions and consequences with market participants.

CONCLUSION

The combination of clearing mandates, government prescriptions regarding clearinghouse design, and government support for CCPs threatens financial stability. A preferable approach would eliminate government backstops and leave decisions about which products should be centrally cleared and how CCPs should operate to private decision makers. The current regulatory framework would be replaced by a principles-based regulatory approach and mandatory reporting of swaps transactions.

Despite good intentions, the Dodd-Frank framework has given rise to a new set of risks by compromising the effectiveness of clearinghouse risk management while simultaneously encouraging CCPs to embrace new risks. The drive for clearing colors regulatory oversight and impedes markets and regulators from thinking clearly about the associated risks. Prescriptive regulation displaces or distorts CCPs' own risk management initiatives. The risk management focus of CCPs is further dulled by calls to dampen the influence of clearing members and populate their boards with independent directors. The preference given to cleared instruments has a secondary effect of making it more difficult for parties to manage risk outside CCPs and less imperative for parties to monitor one another. Moreover, the growth and change of CCPs in response to government policy builds bailout expectations.

To foster financial stability, policymakers should eliminate clearing mandates, the attendant prescriptive regulatory regime for CCPs, systemic designations of CCPs, and special Federal Reserve privileges for CCPs. A replacement regulatory framework could consist of a broad set of principles for CCPs, a reporting framework for cleared and uncleared swaps, a governance framework for CCPs that includes market participants who bear the risks, and a clear delineation of default waterfalls and CCP recovery plans. A return to private ordering in the OTC derivatives space would diminish bailout expectations and allow market participants to benefit from central clearing where it makes sense, continue to use uncleared swaps where they best manage risk, and monitor and manage both CCP and non-CCP risk effectively.

Domestic political realities and the shared international commitment to mandatory clearing may stand in the way of the proposed return to private ordering. If clearing mandates remain in place, policymakers can benefit from considering the concerns raised here and elsewhere about the risks associated

with mandatory clearing and the regulatory structure. Regulators need to be keenly aware of the deleterious effect poor regulatory requirements can have on CCPs' risk management. Supervisors should apply clearing mandates carefully and only after a full consideration of the risks informed by adequate data. Policymakers should afford CCPs and their participants the regulatory flexibility necessary to manage risk effectively and should monitor CCPs closely, but not micromanage them. Regulators and market participants should continue to work together to understand how CCPs would perform under stressed scenarios and how losses from the default of one or more clearing members would be allocated. Relationships among CCP supervisors have been tense in recent years, but cooperation is critical. Regardless of whether the clearing mandate remains in place, CCPs will continue to play an important role in the financial system. Accordingly, efforts by regulators, market participants, and academics to better understand, manage, and monitor CCP risks are well worth the commitment of resources, time, and attention.

NOTES

1. Pub. L. No. 111-203, 124 Stat. 1376 (2010).
2. Professor Craig Pirrong raised concerns about the clearing mandate early, eloquently, and often. See, for example, Pirrong, "Bill of Goods," 55, and "Clearinghouse Cure." Others also have raised concerns. See Levitin, "Response," 445, 453; Roe, "Clearinghouse Overconfidence," 1641; Wibaut and Wilford, "Markets for CCPs and Regulation," 102. While citing the risk-reducing aspects of CCPs, the Office of Financial Research and Financial Stability Oversight Council also identified CCPs as a potential source of systemic risk. Financial Stability Oversight Council, "2015 Annual Report," 11, identifies CCPs as a "potential emerging threat and vulnerability." Office of Financial Research, "2014 Annual Report," 66, notes that "[b]anks could face significant losses if a CCP experienced losses and transmitted them to clearing members" and highlights potential liquidity effects of margin requirements.
3. Acharya et al., "Derivatives," 234.
4. In the US futures markets, exchanges typically are vertically integrated with clearinghouses, whereas clearinghouses in the equities and options markets are independent of exchanges. For a historical and regulatory discussion of why these markets developed differently, see Wolkoff and Werner, "History of Regulation," 313.
5. The US derivatives market is concentrated; four commercial banks—JPMorgan Chase Bank, Bank of America, Citibank, and Goldman Sachs—have approximately 90 percent of the banking industry's derivatives. Office of the Comptroller of the Currency, OCC's Quarterly Report on Bank Derivatives Activities Third Quarter 2015, 1, graphs 4 and 5 (based on notional amounts).
6. In addition to carefully crafted risk management, there were historically other reasons, such as accounting reasons, for using these specially tailored derivatives. See Heckinger, Ruffini,

and Wells, "Over-the-Counter (OTC) Derivatives," 27, which discusses the reasons for using the OTC derivatives markets.

7. Office of the Comptroller of the Currency, OCC's Quarterly Report on Bank Trading and Derivatives Activities Third Quarter 2015, 10, observes that "interest rate contracts continue to represent the lion's share of the derivatives market at 76.9% of total derivatives. FX and credit derivatives are 16.7% and 4.3% of total notionals, respectively. Commodity and equity derivatives collectively are only 2.1% of total notional derivatives."

8. Heckinger, Ruffini, and Wells, "Over-the-Counter (OTC) Derivatives." This chapter uses the term "swaps" as a rough shorthand for OTC derivatives.

9. For a concise history of clearinghouses in the United States, see Bernanke, "Clearinghouses, Financial Stability, and Financial Reform," 9.

10. See, for example, Knott and Mills, "Modelling Risk," 162n2. These services need not be provided by a CCP. See, for example, Ledrut and Upper, "Clearing Post-Trading Arrangements for OTC Derivatives," 92: "Given that CCP services have been limited to a restricted set of contracts," they write, "market participants have explored other avenues to obtain some of the benefits of CCPs [including] centralization of information or multilateral netting. . . ."

11. Initial margin, which is collected at the outset of a transaction and adjusted periodically, "is designed to cover the worst-case close out costs (due to the need to find replacement transactions) in the event a member defaults." Gregory, *Central Counterparties*, § 3.2.4. Variation margin, which is adjusted at least daily, reflects net changes in the market value of clearing members' portfolios. *Compare* 17 C.F.R. § 1.3(ccc), which defines initial margin as "money, securities, or property posted by a party to a futures, option, or swap as performance bond to cover potential future exposures arising from changes in the market value of the position," *with* 17 C.F.R. § 1.3(fff), which defines variation margin as "a payment made by a party to a futures, option, or swap to cover the current exposure arising from changes in the market value of the position since the trade was executed or the previous time the position was marked to market." For further discussions of margin, see Duffie, Li, and Lubke, "Policy Perspectives on OTC Derivatives," 7–9 and app. C; Gregory, *Central Counterparties*, chap. 6 and § 8.3.3; McPartland, "Clearing and Settlement"; Turbeville, "Derivatives Clearinghouses," 9–12.

12. Because the burdens of CCP membership are high, most swap market participants prefer indirect access through a clearing member or—even more indirectly—through a clearing member's client. See, for example, Braithwaite, "Legal Perspectives on Client Clearing," 9: "The membership criteria for clearing services for OTC derivatives are onerous, even by the standards of other clearing services. This is because a CCP faces more risk clearing OTC derivatives, which have very high values and long maturities compared to other cleared contracts (e.g., for commodities), while the operational complexities involved in clearing OTC derivatives are also far greater." Gregory, *Central Counterparties*, § 8.3.2, explains that some market participants, "particularly buy side and smaller financial institutions," either may not be eligible for membership or "may find the indirect clearing route more efficient."

13. Under international guidelines, systemically important CCPs are supposed to be prepared to handle the simultaneous default of their two largest clearing members and their affiliates (the so-called Cover 2 standard). CPSS/IOSCO, "Principles for Financial Market Infrastructures," 36. According to principle 4, "a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions."

14. See, for example, Yellen, "Interconnectedness and Systemic Risk," 15–16.

15. See, for example, Squire, "Clearinghouses as Liquidity Partitioning," 857.

16. The Group of Twenty (G20) nations, meeting after the crisis, made "[i]mproving over-the-counter derivatives markets" a key element of their postcrisis regulatory reform plans:

> "All standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest. OTC derivative contracts should be reported to trade repositories. Non-centrally cleared contracts should be subject to higher capital requirements."

See G20 Leaders' Statement at the Pittsburgh Summit, 9.

17. Dodd-Frank § 721 (codified at 7 U.S.C. § 1a (2012)) defines "swap dealers" and "major swap participants." A parallel provision—Dodd-Frank § 761 (codified at 15 U.S.C. § 78c(a) (2012))—defines "security-based swap dealer" and "major security-based swap participant." Dodd-Frank directs the CFTC and SEC to further define all of those terms and "swap," "security-based swap," "eligible contract participant," and "security-based swap agreement"; see Dodd-Frank § 712(d)(1) (codified at 15 U.S.C. § 8302 (2012)). These definitions are important as they help to determine which transactions are subject to Dodd-Frank requirements.

18. Dodd-Frank § 731 (codified at 7 U.S.C. § 6s(a) (2012)) provides for registration of swap dealers and major swap participants; Dodd-Frank § 764 (codified at 15 U.S.C. § 78o-10 (2012)) provides for registration of security-based swap dealers and major security-based swap participants.

19. Dodd-Frank § 731 (adding 7 U.S.C. § 6s(h)) imposes business conduct requirements on swap dealers and major swap participants; Dodd-Frank § 764 (adding 15 U.S.C. § 78o-8(h)(3)) imposes business conduct requirements on security-based swap dealers and major security-based swap participants.

20. Dodd-Frank § 723(a) (codified at 7 U.S.C. § 2(h)(2) (2012)) directs the CFTC to determine "on an ongoing basis" which swaps must be cleared; Dodd-Frank § 763(a) (codified at 15 U.S.C. § 78c-3(b) (2012)) directs the SEC to determine "on an ongoing basis" which security-based swaps must be cleared.

21. Dodd-Frank § 723(a) (codified at 7 U.S.C. § 2(h)(2) (2012)) sets forth clearing determination factors for the CFTC; Dodd-Frank § 763(a) (codified at 15 U.S.C. § 78c-3(b) (2012)) sets forth clearing determination factors for the SEC.

22. Dodd-Frank § 723(a) (codified at 7 U.S.C. § 2(h) (2012)) establishes a swaps clearing requirement; Dodd-Frank § 763(a) (codified at 15 U.S.C. § 78c-3) (2012)) establishes a security-based swaps clearing requirement.

23. Dodd-Frank § 733 (codified at 7 U.S.C. § 7b-3 (2012)) establishes swap execution facilities; Dodd-Frank § 723(a) (codified at 7 U.S.C. § 2(h)(8) (2012)) requires trade execution for swaps; Dodd-Frank § 763(a) (codified at 15 U.S.C. § 78c-3(h) (2012)) requires trade execution for security-based swaps made available to trade; Dodd-Frank § 763(c) (codified at 15 U.S.C. § 78c-4) (2012)) establishes security-based swap execution facilities.

24. Dodd-Frank § 727 (codified at 15 U.S.C. § 2(a) (2012)) provides for swap data repository registration and requires that all swaps be reported to a registered repository; Dodd-Frank § 729 (codified at 7 U.S.C. § 6r (2012)) requires reporting for uncleared swaps; Dodd-Frank § 763(i) (codified at 15 U.S.C. § 78(m), (n) (2012)) provides for security-based swap data repository registration and requires that all security-based swaps be reported to a registered repository; Dodd-Frank § 766 (codified at 15 U.S.C. § 78m-1 (2012)) requires reporting for uncleared security-based swaps.

25. Dodd-Frank § 727 (codified at 7 U.S.C. § 2(a) (2012)) requires public reporting of swap transaction data; Dodd-Frank § 763(i) (codified at 15 U.S.C. § 78(m) (2012)) requires public reporting of security-based swap transaction data.

26. Dodd-Frank § 731 (codified at 7 U.S.C. § 6s(e) (2012)) provides for capital and margin requirements for swaps; Dodd-Frank § 764 (codified at 15 U.S.C. § 78o-8(e) (2012)) provides for capital and margin requirements for security-based swaps.

27. Bernanke, "Clearinghouses, Financial Stability, and Financial Reform," 9.

28. Dodd-Frank § 725(a) (codified at 7 U.S.C. § 7a-1 (2012)).

29. Dodd-Frank § 763(b) (codified at 15 U.S.C. § 78q-1(g) (2012)). Entities providing clearing services for securities must register with the SEC under, and meet the requirements set forth in, section 17A of the Securities Exchange Act of 1934 (codified at 15 U.S.C. § 78q-1(b)) and rule 17Ab2-1, 17 C.F.R. § 240.17Ab2-1 (2016)).

30. Dodd-Frank § 725(b) (codified at 7 U.S.C. § 7a-1(h) (2012)) authorizes the CFTC to exempt comparably supervised CCPs; Dodd-Frank § 763(b) (codified at 15 U.S.C. § 78q-1(k) (2012)) authorizes the SEC to exempt comparably supervised CCPs.

31. Dodd-Frank § 725(c) (codified at 7 U.S.C. § 7a-1(c)(2)(A)(i) (2012)) requires DCOs to adhere to rules imposed by the CFTC pursuant to 7 U.S.C. § 12a(5); Dodd-Frank § 763(b) (codified at 15 U.S.C. § 78q-1(i), (j) (2012)) authorizes the SEC to write security-based swap clearing agency standards.

32. Dodd-Frank § 726 (codified at 15 U.S.C. § 8323 (2012)) directs the CFTC to review the need for and adopt conflict-mitigating rules; Dodd-Frank § 765 (codified at 15 U.S.C. § 8343 (2012)) provides a parallel provision for the SEC. See also Dodd-Frank § 725(d) (2010) (codified at 7 U.S.C. § 7a-1 note (2012)), which directs the CFTC to "adopt rules mitigating conflicts of interest in connection with the conduct of business by a swap dealer or a major swap participant with a [swaps DCO] in which the swap dealer or major swap participant has a material debt or material equity investment." Congress considered more stringent limits on control and voting rights as a way to prevent large dealers from becoming too influential at CCPs. The Lynch Amendment—in the words of its sponsor, Representative Stephen Lynch—would have "prevent[ed] those big banks and major swap participants, like AIG, from taking over the police station—these new clearinghouses . . . by limiting to a 20 percent voting stake the ownership interest in those banks and the governance of the clearing and trading facilities." 155 Cong. Rec. H14, 713 (daily edition, December 10, 2009).

33. Dodd-Frank § 725(c) (codified at 7 U.S.C. § 7a-1(c)(2)(C)(iii)(III) (2012)) requires that DCOs provide "fair and open access"; Dodd-Frank § 763 (codified at 15 U.S.C. § 78c-3(a)(2)(B) (2012)) requires that clearing agencies "provide for non-discriminatory clearing of a security-based swap executed bilaterally or on or through the rules of an unaffiliated national securities exchange or security-based swap execution facility." Open access stands in contrast with the futures model in which DCOs clear the contracts traded on a particular exchange.

34. Dodd-Frank § 725(c) (codified at 7 U.S.C. § 7a-1(c)(2) (2012)).

35. Dodd-Frank § 804 (codified at 12 U.S.C. § 5463 (2012)). For a general overview of Title VIII, see Michel, "Financial Market Utilities." Among the designated financial market utilities (FMUs) are the Chicago Mercantile Exchange, Inc. and ICE Clear Credit LLC, both of which clear swaps. See FSOC Designations, last retrieved April 3, 2015, http://www.treasury.gov/initiatives/fsoc/designations/Pages/default.aspx#FMU.

36. Dodd-Frank § 805(a)(2) (codified at 12 U.S.C. § 5464(a)(2) (2012)) relates to setting standards; Dodd-Frank § 807 (codified at 12 U.S.C. § 5466 (2012)) is related to examination and enforcement.

37. Dodd-Frank § 813 (12 U.S.C. § 5472 (2012)); see also Board of Governors of the Federal Reserve System, SEC and CFTC, "Risk Management Supervision of Designated Clearing Entities," July 2011, a joint report required by section 813 of the Act.

38. Dodd-Frank § 805(c) (codified at 12 U.S.C. § 5464(c) (2012)).

39. Dodd-Frank § 806(e) (codified at 12 U.S.C. § 5465(e) (2012)).

40. See, for example, BIS, "Report of the Committee on Interbank Netting Schemes"; and its Committee on Payment and Settlement Systems and Technical Committee of the International Organization of Securities Commissions, "Recommendations for Central Counterparties."

41. See 15 U.S.C. §78q-1(i) (2012), suggesting that the SEC "conform [security-based swap clearing agency] standards or oversight to reflect evolving United States and international standards."

42. CPSS/IOSCO, "Principles."

43. Pirrong, "Inefficiency of the Clearing Mandate," 33.

44. See, for example, Parkinson, "CCP Liquidity Risk Management," 2–3, which notes that "the central concern with respect to CCP liquidity risk is that a failure of one or more clearing members to meet variation margin calls on time could cause the CCP itself to be unable to meet its own payment obligations as and when expected" and that "[s]uch a failure could jeopardize the ability of its nondefaulting clearing members to meet their payment obligations when expected and thus is a potential vector for financial contagion."

45. Gregory, *Central Counterparties*, § 9.1.4, states that "CCPs may make one or more intra-daily margin calls per day and typically only return margin once a day. Such effects would be most pronounced during volatile markets where large price moves may cause CCPs to ask for very large intraday margins from some participants covering their losses, whilst possibly not returning immediately the equivalent margin against gains of other clearing members."

46. Roe, "Clearinghouse Overconfidence," 1664, 1671–72. Others argue that CCPs are stability enhancing because they ensure that some creditors get paid quickly without slowing down payments to other creditors; see Squire, "Clearinghouses as Liquidity Partitioning," 857.

47. Knott and Mills, "Modelling Risk," 164. See also Domanski, Gambacorta, and Picillo, "Central Clearing," 72. They write that "extreme price movements in cleared financial instruments could result in large variations in the exposure of clearing members to the CCPs and therefore in the need for some of them to make correspondingly large variation margin payments. Such payments can be large, even if margin requirements remain unchanged. But they may be exacerbated if the CCP increases initial margins and/or tightens collateral standards in the face of unusually large price movements. The interaction of such sudden and large shifts in collateral flows with the wider financial system is untested. . . . The demands and dispositions of CCPs could lead to big shifts in collateralized markets, adding to risk aversion and increasing pressure to reduce leverage in a procyclical manner."

48. Knott and Mills, "Modelling Risk," 164.

49. Pirrong, "Bill of Goods," 62–74. See also Tarullo, "Advancing Macroprudential Policy Objectives," which raises concerns about, among other things, CCPs imposing losses on large firms during crises.

50. See Rahman, "Over-the-Counter (OTC) Derivatives," 290. The author writes that "there are a relatively small number of clearing members for these CCPs, and fewer still that

offer client clearing. Those clearing members that do offer client clearing become more important within the system because non-clearing member firms would otherwise be unable to access central clearing, hindering their ability to undertake OTC derivatives transactions (especially if these contracts become subject to the clearing obligation)" (footnote omitted).

51. Wendt, "Central Counterparties," 9. "Global systemically important banks (G-SIBs) and other commercial banks," Wendt writes, "may fulfill roles of general clearing member (clearing for clients), liquidity provider, depository bank, custodian and settlement bank."

52. See, for example, Parkinson, "CCP Liquidity Risk Management," 4; Steigerwald, "Central Counterparty Clearing," 21–22.

53. Powell, "Financial System Perspective," 4: "To carry out their critical functions, CCPs rely on a wide variety of financial services from other financial firms, such as custody, clearing, and settlement. Many of these services are provided by the same global financial institutions that are also the largest clearing members of the CCPs." See also Domanski, Gambacorta, and Picillo, "Central Clearing," 68: "The CCP's own liquid assets and backup liquidity lines made available by banks may provide effective insurance against liquidity shocks resulting from the difficulties of one or a few clearing members. But they can hardly provide protection in the event of a systemic shock, when a large number of clearing participants—potentially including the providers of liquidity lines—become liquidity-constrained, thereby triggering domino effects."

54. See, for example, Wendt, "Central Counterparties," 9, which explains that a CCP is "particularly vulnerable to the default of a service-providing clearing member . . . not only because it has to cover the default of the clearing member, but because it may also lose access to the collateral kept by that clearing member in its role as custodian[,] may lose access to the credit lines that were provided by the defaulting clearing member and it may face operational problems due to the loss of one of its settlement banks."

55. See generally *Report of the Presidential Task Force on Market Mechanisms*. Known as the Brady Commission Report, it describes the events of the 1987 crash. See also McPartland, "Clearing and Settlement," 3, which explains that "a CCP can only remove market risk from its clearing system when the national banking system is open," adding that "late settlement payments associated with derivatives markets were one of the root causes of near payments gridlock during the 1987 market crash."

56. Bernanke, "Clearing and Settlement during the Crash," 133, 146–47. The IMF points to the role that operational weaknesses played during the 1987 crash in the near failures of the Chicago Mercantile Exchange (CME) and the Options Clearing Corporation (OCC); see IMF, "Making Over-the-Counter Derivatives Safer," 18–19.

57. Bernanke, "Clearing and Settlement during the Crash," 133, 148.

58. Ibid., 133, 147.

59. Ibid., 149. Bernanke writes that "the Federal Reserve, in its lender-of-last-resort capacity . . . induce[d] the banks (by suasion and by the supply of liquidity) to make loans on customary terms, despite chaotic conditions and the possibility of severe adverse selection of borrowers."

60. Some operational concerns still remain. See Anderson and Jõeveer, "Economics of Collateral," which finds that "moving toward central clearing with product specialized CCPs can greatly increase the numbers of margin movements which will place greater demands on a participant's operational capacity and liquidity."

61. See, for example, "Liquidity Coverage Ratio: Liquidity Risk Measurement Standards," 79 Fed. Reg. (October 10, 2014): 61439.

62. See, for example, transcript of the CFTC Market Risk Advisory Committee Meeting, Washington, DC, April 2, 2015, 95 (statement of Emily Portney, JPMorgan).

63. See, for example, transcript of CFTC Market Risk Advisory Committee Meeting, 89 (statement of Scott Flood, Citi's Institutional Client Group).

64. See Domanski, Gambacorta, and Picillo, "Central Clearing," 68–69. The authors explain that "[i]n the extreme case, the default of common clearing members could threaten the resilience of several CCPs at the same time [which], in turn, would impose strains on the surviving clearing members, propagating systemic risk."

65. See, for example, Parkinson, "CCP Liquidity Risk Management," 3. "If confidence in a CCP is shattered and, as is often the case, no other CCP serves the market, the market would cease functioning."

66. The statutory framework does not explicitly allow for emergency termination or suspension of the clearing mandate. FIA Europe raised a permutation of this issue—a CCP would have to continue clearing a product subject to a clearing mandate and taking on the associated risk during a crisis. FIA Europe, "Review of the Cumulative Impact," 12: "[T]he clearing obligation cannot be terminated or suspended as a matter of urgency in extreme circumstances. This means that CCPs may find themselves clearing more risk in a contract or product than there would be market capacity to manage upon a member default. A CCP may therefore have no option but to encourage participants to reduce these clearing provisions by increasing margin requirements to levels at which it is uneconomic to hold the positions and thus force the risk to be closed out."

67. See, for example, Elliott, "Central Counterparty Loss-Allocation Rules," sec. 4, which discusses the potential adverse effects of a CCP failure.

68. For a discussion of the association between central clearing and high collateral demands, see Singh, "Making OTC Derivatives Safe," 5.

69. Ibid., 9.

70. For an excellent discussion of the potential for lost hedging opportunities and increased costs for swaps end-users as a result of the central clearing mandate, see McBride, "The Dodd-Frank Act and OTC Derivatives," 1111–19. Market observers have noted that futures products are emerging to take the place of certain types of swaps. See, for example, CFTC, Transcript of the Public Roundtable on Futurization of Swaps.

71. Beylin, "Reassessment of the Clearing Mandate," 15, 48.

72. See Singh, "Making OTC Derivatives Safe," 4: "Offloading only standard contracts will adversely impact the net exposure on their books as this will 'unbundle' netted positions. . . ." For a general discussion of this topic, see McBride, "The Dodd-Frank Act and OTC Derivatives," 1106–8.

73. See McPartland, "Clearing and Settlement," 2: "In an electronic trading environment, clearing provides valuable anonymity; buyer and seller (and buying clearing member and selling clearing member) rarely know (or need to know) each other's identity."

74. See Roe, "Clearinghouse Overconfidence," 1641, 1694–95.

75. Knott and Mills, "Modelling Risk," 172, explains, for example, that ". . . residual exposure to the uncovered losses of the CCP . . . creates an incentive for clearing members to take an active interest in the overall standard of a CCP's risk management."

76. Gregory, *Central Counterparties*, § 3.2.6, explains that a key to the CCP "loss mutualisation" model is the requirement that "all members pay into [a] default fund [and thus] all

contribute to absorbing an extreme default loss." See also IMF, "Making Over-the-Counter Derivatives Safer," 17, which notes that "guarantee fund contributions should be related to the [clearing member's] market position and the nature of its exposures and be reevaluated regularly."

77. See CME Rulebook, sec. 8F010, which explains that "if the Clearing House determines in good faith that, based on the exercise of prudent risk management standards, that an OTC Clearing Member poses undue risk to the Clearing House based on its OTC Derivatives portfolio, the Clearing House may take any or all of the following actions with respect to such OTC Clearing Member: 1) impose an additional performance bond requirement; 2) prohibit the addition of any new OTC Derivative positions, or 3) require the reduction or unwinding of OTC Derivatives positions." ICE Clear Credit Rulebook (2015), 16, explains that "for the protection of ICE Clear Credit and the Participants, ICE Clear Credit shall be authorized: (i) to impose such additional capital, Margin or other requirements on a Participant; (ii) to allow such Participant to submit Trades for liquidation only; (iii) to limit or restrict the type of Contracts that may be cleared by such Participant in any of its accounts with ICE Clear Credit; or (iv) to limit or restrict the aggregate notional or other reference amount of positions in Contracts that are permitted to be maintained by such Participant in any of its accounts with ICE Clear Credit."

78. See, for example, Parkinson, "CCP Liquidity Risk Management," 6, which suggests that "perhaps the most important reason a CCP can reduce risk is that a CCP has a more complete picture of the aggregate risks posed by participants than do counterparties to uncleared transactions."

79. Pirrong, "Economics of Central Clearing," 14 (footnote omitted).

80. Tucker, "Are Clearing Houses the New Central Banks?," 2. See also Chang, "Systemic Risk Paradox," 773. "Lulled by a false sense of security and goaded by improvements in hedging from DCOs," the author writes, "players might take on more derivatives at greater notional values. Counterparties might monitor each other less, trusting that DCOs are doing so—whereas counterparties trading bilaterally likely understand each other better than a DCO would" (footnotes omitted).

81. See, for example, Cœuré, "Ensuring an Adequate Loss-Absorbing Capacity": "In fact, a substantial increase of 'skin in the game' could provide clearing members with a false sense of security, by reducing their potential contribution to the loss-allocation process. This could lead them to be less vigilant in monitoring risks, which may have severe consequences for the safety of CCPs. . . . [I]t seems reasonable that an increase in prefunded resources, should it become necessary, should be mainly borne by clearing members" (footnote omitted).

82. See Rundle, "Helping Clearing Houses Avoid a Crash." The author writes, "Not surprisingly, clearing members are wanting more transparency on how clearing houses will operate in a crisis. Concerns are high that the stress-testing methodologies they use and the extent to which members might be required to prop up a clearer are ill-defined, to the point that it may increase risk in stressed markets." CCPs are not particularly sympathetic to this concern. See, for example, CME Group et al., letter to Jacob L. Lew, 3: "With full transparency into a CCP's financial safeguards and default management practices, clearing members and participants have sufficient information to evaluate the risk profile of the CCP and manage their own exposures."

83. See, for example, 17 C.F.R. § 23.432, which requires swap dealers and major swap participants to disclose "that the counterparty has the sole right to select the derivatives clearing organization at which the swap will be cleared." The nondealer's clearing member presumably will monitor the CCP, but requiring that the nondealer choose the CCP still removes the decision from the party with the most direct access to information about the CCP.

84. For the considerations that go into decisions whether to clear, see Gregory, *Central Counterparties*, § 12.1.3.

85. CPSS/IOSCO, "Guidance on the Application," iii. The document provides an extensive discussion of the unique complexities of an OTC derivatives CCP.

86. Singh, "Making OTC Derivatives Safe," 9. See also Cohn, "Clearing Houses Reduce Risk." The Goldman Sachs president and chief operating officer sets forth an argument that nonstandardized products in deeply liquid markets can safely be cleared, but "in other markets, clearing houses can themselves become centres of concentrated risk and sources of contagion, amplifying systemic problems instead of alleviating them." Cohn explains that forcing central clearing on "complex, illiquid products that are susceptible to sudden and severe price gaps . . . can have serious repercussions."

87. CPSS/IOSCO, "Guidance on the Application," 13, notes that "some products may have nonlinear risk characteristics (e.g., jump-to-default risk in a single-name CDS)."

88. See Knott and Mills, "Modelling Risk," 172, which notes that "it will be important for CCPs to develop and enhance scenario-based stress-testing procedures which assess the impact of low probability, but nonetheless plausible events, which may have no precedent in the current historical record."

89. Pirrong, "Economics of Central Clearing," 18, explains that "in many OTC products, liquidity tends to decline over time, and these positions are often retained for extended periods."

90. See Wibaut and Wilford, "Markets for CCPs and Regulation," 112. The authors explain that correlations "are unlikely to hold when it matters most—a systemic disruption with significant market contagion."

91. See Knott and Mills, "Modelling Risk," 170: "As CCPs expand into new markets, . . . there is a question about how effectively SPAN [a common margin methodology] can be adapted to deal with the more complex portfolios that result."

92. CPPS/IOSCO, "Guidance on the Application," 13.

93. Dodd-Frank §723(a)(2) (adding 7 U.S.C. § 2(h)(2)(D)(ii)).

94. Ibid.

95. As an illustration, in the following clearing determination, the CFTC repeats the standard arguments for clearing without applying them specifically to the CDS indices allegedly being analyzed:

> "Clearing the CDS indices subject to this determination will reduce systemic risk in the following ways: mitigating counterparty credit risk because the DCO would become the buyer to every seller of CDS indices subject to this determination and vice-versa; providing counterparties with daily mark-to-market valuations and exchange of variation margin pursuant to a risk management framework set by the DCO and reviewed by the Commission's Division of Clearing and Risk; posting initial margin with the DCO in order to cover potential future exposures in the event of a default; achieving multilateral netting, which substantially reduces the number and notional amount of outstanding bilateral positions; reducing swap counterparties' operational burden by consolidating collateral management and cash flows; and eliminating the need for novations or tear-ups because clearing members may offset opposing positions."

CFTC, "Clearing Requirement Determination under Section 2(h) of the CEA," 77 Fed. Reg. (December 13, 2012): 74283, 74297.

96. For example, Carr, "CCPs Mull Equity Swaps," reports that a number of CCPs are "exploring the possibility of clearing a broader range of equity swap products," which could ultimately lead to new clearing mandates; see also Domanski, Gambacorta, and Picillo, "Central Clearing," 72, which notes that "most CCPs are for-profit entities—typically vertically integrated with other financial market infrastructures, such as exchanges—that are strongly motivated to generate revenues by expanding their product offering and capturing market share. However, new products could bring incremental risk, which clearing members may end up bearing if the CCP does not increase its capital commensurately."

97. Professors Darrell Duffie and Haoxiang Zhu show that "[r]elative to the case of fully bilateral netting (no clearing), substantial [counterparty risk reduction] benefits can be obtained by the joint clearing of the four major classes of derivatives" and call for "the joint clearing of standard interest-rate swaps and credit default swaps in the same clearinghouse." Duffie and Zhu, "Does a Central Clearing Counterparty?," 88, 90. See also Squire, "Clearinghouses as Liquidity Partitioning," 919, which argues that, in order to increase netting opportunities, regulators should follow "the aphorism 'in for a dime, in for a dollar.'"

98. See CFTC, "Final Rule and Interim Final Rule: Margin Requirements for Uncleared Swaps for Swap Dealers and Major Swap Participants," 81 Fed. Reg. (January 6, 2016): 671: "The final rule implements the new statutory framework . . . which requires the Commission to adopt capital and initial and variation margin requirements for [covered swap entities] on all uncleared swaps in order to offset the greater risk to the swap entity and the financial system arising from the use of swaps and security-based swaps that are not cleared." See CFTC, "Proposed Rule: Margin Requirements for Uncleared Swaps for Swap Dealers and Major Swap Participants," 79 Fed. Reg. (October 3, 2014): 59901: "Given the Congressional reference to the 'greater risk' of uncleared swaps and the requirement that margin for such swaps 'be appropriate for the risk,' the Commission believes that establishing margin requirements for uncleared swaps that are at least as stringent as those for cleared swaps is necessary to fulfill the statutory mandate." See also Yellen, "Interconnectedness and Systemic Risk," 19–20, which explains that "a more robust and consistent margin regime for non-centrally cleared derivatives will not only reduce systemic risk, but will also diminish the incentive to tinker with contract language as a way to evade clearing requirements."

99. See generally Basel Committee on Banking Supervision, "Capital Requirements." For a discussion of how capital rules apply to uncleared and cleared transactions, see Office of the Comptroller of the Currency and Board of Governors of the Federal Reserve System, "Regulatory Capital Rules: Regulatory Capital, Implementation of Basel III, Capital Adequacy, Transition Provisions, Prompt Corrective Action, Standardized Approach for Risk-Weighted Assets, Market Discipline and Disclosure Requirements, Advanced Approaches Risk-Based Capital Rule, and Market Risk Capital Rule," 78 Fed. Reg. (October 11, 2013): 62094–103.

100. Dodd-Frank §§ 723(a) (adding 7 U.S.C. §2(h)(4)) directs the CFTC to prevent evasion of clearing mandate with respect to swaps; 763(a) (adding 15 U.S.C. § 78c-3(d)) directs the SEC to prevent evasion of clearing mandate with respect to security-based swaps. See also CFTC-SEC Conflicts Roundtable, 40 (comments of Heather Slavkin, AFL-CIO, which suggests that there would be "spurious customization" to avoid the clearing mandate); and Financial Stability Board, "Implementing OTC Derivatives," 21, which warns regulators to be wary of customization as a way to avoid clearing.

101. See Massad, Keynote Address, which underscores the importance of CCP regulation "because of the increased importance we have placed on central clearing." See also Allen, "Derivatives Clearinghouses and Systemic Risk," 1106, which calls for strict regulation and a prefunded guaranty fund with a government backstop; Bernanke, "Clearinghouses," 9, which explains that a robust prudential regulatory regime must accompany access to emergency credit facilities;

Powell, "Financial System Perspective," which explains that international CCP standards are "essential given that, in the interest of transparency and improved risk management, policymakers have encouraged the concentration of activities at these key nodes"; Tucker, "Are Clearing Houses the New Central Banks?," 12. A former UK central bank official, Tucker explains that "[l]ike central banks, clearing houses are part of the essential financial plumbing of modern economies." He argues that CCPs should be macroprudentially "regulated utilities." See also Levitin, "Response," 462, which identifies a potential role for regulation of CCP rules but argues principally for high capital standards to serve as a "financial sea wall" for CCPs.

102. See Greenberger, "Diversifying Clearinghouse Ownership," 245, 257. See also Nosal, "Clearing Over-the-Counter Derivatives," 143–44, which argues that broad membership fosters liquidity and competition, so any firm that "can cover the risk that it brings into the CCP, by providing appropriate levels of collateral and making contributions to the guarantee fund," should be allowed membership.

103. See Pirrong, "Economics of Central Clearing," 27, which explains that "CCPs with more diverse memberships are more prone to conflict, more cumbersome to manage, less effective at responding to changes in the marketplace and less effective at responding to crises that are likely to have disparate impacts on different types of firms," and they are more vulnerable to "moral hazard problems." Angela Armakola and Jean-Paul Laurent underscore the important relationship between CCP resilience in the face of stress scenarios and the strength of a CCP's member base. See Armakola and Laurent, "CCP Resilience and Clearing Membership," 26, which urges regulators to be "cautious about . . . subsidising of low quality [clearing members] that might overload a CCP at the expense of others, thus jeopardizing the efficiency of the new risk-sharing mechanisms."

104. See Braithwaite, "Legal Perspectives on Client Clearing," 16–17, which observes that the clearing mandate could effectively shut certain parties out of OTC markets subject to a mandate if they are neither eligible to be members nor desirable clients for a member. See also SEC, "Final Rule: Clearing Agency Standards," 77 Fed. Reg. (November 2, 2012): 66240, which explains that "the success of correspondent clearing arrangements depends on the willingness of participants to enter such arrangements with non-participant firms that may act as direct competitors to the participants in the participants' capacity as dealers or security-based swap dealers in the market for the relevant securities."

105. CFTC, "Final Rule: Derivatives Clearing Organization General Provisions and Core Principles," 76 Fed. Reg. (November 8, 2011): 69353.

106. Ibid.

107. Ibid., 69355. The CFTC argued that "the addition of smaller clearing members does not eliminate the role that larger clearing members can play in default management—it merely spreads the risk," and that "[s]ubject to appropriate safeguards, outsourcing of certain obligations can be an effective means of harmonizing these goals" (69356). It is questionable whether these outsourcing arrangements would be honored during a crisis when they would most likely be called upon.

108. Ibid., 69357.

109. Braithwaite, "Legal Perspectives on Client Clearing," 12.

110. "Q&A with Hal Scott of Harvard Law."

111. Michel, "Financial Market Utilities," 10.

112. CPSS/IOSCO, "Principles," 1.

113. Ibid., 26.

114. Varney et al., Letter to CFTC, 7. See also Chang, "Systemic Risk Paradox," 795, 810–12. The author writes that "because big banks, which tend to be the powerhouse derivatives dealers, control clearinghouses, there is a danger that big banks can leverage the dominance of clearinghouses to consolidate their share in the dealer market" and argues for the application of the "essential facilities doctrine" for the purpose of "clarifying when rivals of clearinghouse members might be able to pursue a private right of action" (footnote omitted). See also Johnson, "Commentary on the Abraham L. Pomerantz Lecture," 696–701, which argues that large dealer CCP members' "rent-seeking motives" could lead CCPs to make decisions that undermine the role of CCPs in risk mitigation.

115. See, for example, Greenberger, "Diversifying Clearinghouse Ownership," 265–66n, which calls for at least half of directors to be independent; Griffith, "Governing Systemic Risk," 1240, which argues for half of directors on CCP boards to be selected by regulators and thus attuned to systemic risk considerations; Johnson, "Governing Financial Markets," 221, 240, which points to the "conflict between regulators' expectations and . . . clearinghouse owners' priorities" and calls for a regulator-appointed monitor to serve as a board watchdog who "would report directly to and receive compensation from" regulators; Kelleher, letter to David A. Stawick, 16, which advocates that a CCP's risk management committee "be controlled in form and substance by independent decision-makers"; Varney et al., letter to CFTC, 7, which calls for the risk management committee to be populated with a majority of independent directors.

116. For a description and analysis of the different proposed approaches, see Griffith, "Governing Systemic Risk," 1212–26.

117. Wetjen, "Ensuring the Promise." See also Bailey, "Bank of England's Perspective." Bailey called for "[s]tandardised stress tests" to "complement more tailored and potentially much more rigorous internal stress testing, developed and implemented by individual CCPs." See also Powell, "Financial System Perspective." "Not all CCPs are alike," according to Powell, "[b]ut there may be approaches that could bring some of the benefits of standardization while allowing tailoring of some scenarios to the activities of particular CCPs or groups of CCPs."

118. Wetjen, "Ensuring the Promise."

119. An anonymous peer reviewer raised this concern. A full analysis of regulatory capture in the post-Dodd-Frank derivatives markets is beyond the scope of this chapter but would be a productive area for further research.

120. Stigler, "Theory of Economic Regulation," 3.

121. Shadow Financial Regulatory Committee, "Dangers of Substituting Foreign Compliance," 1.

122. See CFTC and SEC, "Joint Report," 88. "The CFTC does not have clear authority, for example, to set rules for risk management for exchanges and clearinghouses. The CFTC's authority contrasts with the authority of other regulators, such as the SEC or regulators in foreign jurisdictions."

123. Saltzman, letter to Jacob Lew, 2, requested "that the FSOC coordinate and work with its member agencies with authority over CCPs to strengthen the ability of CCPs to mitigate and manage systemic risks arising from CCP operations." Others have argued against the one-size-fits-all regulation that might be introduced by active FSOC involvement in CCP regulatory issues; see Duffy et al., letter to Jacob J. Lew.

124. See Wendt, "Central Counterparties," 12: "International coordination among authorities will be challenging, in case of a default impacting multiple jurisdictions, as interests may differ. The home authority may give priority to maintaining the CCP's operations, whereas the authorities of other countries may prioritize the stability of their financial system or local banks." See also Swinburne, Speech before the World Federation of Exchanges/IOMA

Conference. Swinburne commented that she did "not want to see a scenario where the banking regulator of a large clearing member refuses to allow that member to participate in refills of a CCPs default fund as it is concerned about that bank having enough capital to refill one of its own domestically supervised CCPs."

125. Linking can take different forms. See IMF, "Making Over-the-Counter Derivatives Safer," 24–25, box 3.7.

126. Ibid., 18, box 3.5. The IMF discusses CCP failures and highlights the role that failure to properly increase margin requirements played in the failures of the French Caisse de Liquidation, the Malaysian Kuala Lumpur Commodity Clearing House, and the Hong Kong Futures Exchange.

127. Wibaut and Wilford point out, for example, that regulators' role in setting the type of margin that CCPs can accept could be influenced by the same forces that drove regulators to treat German and Greek bonds as equivalent. Wibaut and Wilford, "Markets for CCPs and Regulation," 102n7.

128. To avoid the problem of a sole CCP failing, BlackRock has recommended that the clearing mandate only apply to products cleared by two or more CCPs. BlackRock, "Central Clearing Counterparties," 2. Alternatively, if there were a failure, the government could encourage another already operational and healthy CCP that clears other types of products to begin clearing the products formerly cleared by the failing CCP. Such an expansion, however, would likely take considerable time because it would require the expanding CCP to analyze the risk associated with the new product and any new clearing members and to gain regulatory approval to clear the product. Presumably a willing regulator could expedite such a process in an emergency, but doing so would raise new risk concerns.

129. See Lubben, "Failure of the Clearinghouse," which argues that CCPs likely are not encompassed in the list of companies that can proceed through resolution and that, had CCPs been intended to be covered, the CFTC would have been granted a role in deciding whether a CCP should be put into the Orderly Liquidation Authority; Duffie, "Financial Market Infrastructure," 3, which discusses questions about whether Title II, particularly as interpreted by the Federal Deposit Insurance Corporation, applies to CCPs. But see also Allen, "Derivatives Clearinghouses and Systemic Risk," 1103, which argues that, although Title II applies to CCPs, "the logistical complexities of applying the Orderly Liquidation Authority procedures to an insolvent clearinghouse make government intervention before initiation of the receivership process the most likely outcome."

130. Dodd-Frank § 806(b) provides: "The Board of Governors may authorize a Federal Reserve Bank . . . to provide a designated financial market utility discount and borrowing privileges only in unusual or exigent circumstances, upon the affirmative vote of a majority of the Board of Governors . . . after consultation with the Secretary, and upon a showing by the designated financial market utility that it is unable to secure adequate credit accommodations from other banking institutions." See also Baker, "Federal Reserve's Supporting Role," 180, which explains: "The failure of a systemically significant clearinghouse could be catastrophic. It would threaten widespread, domino-like disruptions of critical money flows that its members and other financial institutions count on to meet their own financial obligations all over the world. Intervention by a government backstop—a last resort clearinghouse—would likely be needed to avert the collapse of a systemically significant clearinghouse. Due to critical but little understood reforms in Title VIII, the Federal Reserve can now assume this role in certain situations."

131. Dodd-Frank § 806(a).

132. The likelihood that the provision will be used for a bailout may be increased by the fact that—as Colleen Baker points out—the phrase "unusual *or* exigent circumstances" is

broader than the "unusual and exigent circumstances" used in the Federal Reserve's emergency lending authority under Section 13(3) [12 U.S.C. § 343(3)(A) (2012)]. Baker, "Federal Reserve's Supporting Role," 180n38.

133. See Powell, "Financial System Perspective," which advises "CCPs and their members" that they "must plan to stand on their own and continue to provide critical services to the financial system, without support from the taxpayer."

134. See Baker, "Federal Reserve's Supporting Role," 184, which argues that "the very presence of a potential central bank backstop for systemically significant clearinghouses—essentially the possibility of catastrophic liquidity insurance—creates a significant moral hazard"; Singh, "Making OTC Derivatives Safe," 17, which points out that the availability of emergency liquidity support "may lead to moral hazard that may manifest itself, for example, in CCPs not requiring full collateral from their existing members/clients, quite possibly with the acquiescence of regulators."

135. See Hills et al., "Central Counterparty Clearing Houses," 129–30, which provides a helpful discussion of the causes of each CCP failure; Moody's Investors Service, "Proposed Clearing House Rating Methodology," exhibit 16. See also Gregory, *Central Counterparties*, §14.2, which discusses "historical CCP failures and near failures"; Tucker, "Counterparties in Evolving Capital Markets," 180, which describes the fallout from the Hong Kong failure.

136. See IMF, "Making Over-the-Counter Derivatives Safer," 18, box 3.5, which highlights the role that failure to properly increase margin requirements played in the CCP failures.

137. See Quarry et al., "OTC Derivatives Clearing," 6.

138. Kong, "Trading Error"; Vaghela, "Korea Clearing Structure"; Whan-woo, "HanMag Debacle Hits Brokerages."

139. McBride, "The Dodd-Frank Act and OTC Derivatives," 1121–22.

140. See, for example, Culp, "OTC-Cleared Derivatives," 1, which notes that CCPs started clearing OTC derivatives in the late 1990s; Kroszner, "Central Counterparty Clearing," 39.

141. The notion that clearing members do not care about CCP risk management is belied by the widespread industry concern about uncapped exposures to CCP risk. See, for example, Saltzman, letter to Jacob Lew, which notes that The Clearing House Association "continues to share the serious concerns raised by regulators regarding the need to address and mitigate systemic risks presented by all CCPs" and details concerns and recommendations for improved risk management.

142. Kroszner, "Central Counterparty Clearing," 37.

143. Pirrong, "Economics of Central Clearing," 28–29.

144. Some have proposed insurance to cover potential losses at the end of the default waterfall. See, for example, Leising, "Catastrophe Prevention Drives Pitch," which describes the formation of an insurance consortium to offer insurance to clearinghouses.

145. Kroszner, "Central Counterparty Clearing," 38.

146. IMF, "Making Over-the-Counter Derivatives Safer," 16, which explains that a race to the risk management bottom "will be counteracted provided that users, who bear the risk of each other's default, have a sufficient voice in governance and particularly if the CCP is user-owned"; Kroszner, "Central Counterparty Clearing," 38: "The mutualization of risk creates incentives for all of the exchange's members to support the imposition of risk controls that limit the extent to which the trading activities of any individual member expose all of [the] other members to losses from defaults. Moreover, because members own the clearinghouse, they have the capability to act on their incentives for effective CCP risk management."

147. See Dodd-Frank § 726, which allows the CFTC to "adopt rules which may include numerical limits on the control of, or the voting rights with respect to, any derivatives clearing organization that clears swaps . . . by a bank holding company . . . with total consolidated assets of $50,000,000,000 or more, a nonbank financial company . . . supervised by the Board, an affiliate of such a bank holding company or nonbank financial company, a swap dealer, major swap participant, or associated person of a swap dealer or major swap participant."

148. See Domanski, Gambacorta, and Picillo, "Central Clearing," 63, which notes that "in 83% of the cases, CCPs are directly owned or managed by the company operating the stock exchange"; Evanoff, Russo, and Steigerwald, "Policymakers, Researchers, and Practitioners," 12, which notes that, "[i]n the U.S., there has been a recent movement away from the traditional model of mutual ownership of exchanges and their clearing and settlement providers, toward a for-profit, stock ownership," which "could have a potential impact on the incentive structure and, possibly, the risk aversion of the organizations."

149. See Hills et al., "Central Counterparty Clearing Houses," 130, which notes that if risk monitoring incentives are to be effective, "providers of the central counterparty's guarantee fund or other capital should also be its owners, or at least . . . management should be accountable to them in some way"; Kroszner, "Central Counterparty Clearing," 39, which explains that "governance arrangements must provide those with 'skin in the game' with substantial influence over the CCP's risk controls"; Pirrong, "Economics of Central Clearing," 26, which argues that "those who bear the counterparty risks assumed by a CCP should have the power to make decisions that affect the riskiness of the CCP, and the distribution of that risk"; Scott, "Reduction of Systemic Risk," 701, which argues against ownership and control restrictions that "would limit the ability of swap dealers and major swap participants, who are the parties with the greatest expertise in risk management, to exercise influence over the policies and operations of a clearinghouse."

150. See Greenberger, "Diversifying Clearinghouse Ownership," 245, which argues for strong limits on the economic interests of swap dealers in CCPs.

151. See Johnson, "Governing Financial Markets," 222–25, which contends that large swap dealers have incentives to limit CCP membership and product eligibility.

152. See Greenberger, "Diversifying Clearinghouse Ownership," 245, which argues "that the CFTC should strengthen its proposed governance standards for DCOs in order to safeguard swap users' access to clearing against the possibility that the CFTC's participant eligibility requirements fail to increase DCO membership" (footnote omitted); Johnson, "Governing Financial Markets," 239–41, which argues for a board monitor or observer to provide a link between CCP boards and regulators.

153. See Griffith, "Governing Systemic Risk," 1212–26, which acknowledges that "dealers must exert a level of control over clearinghouse operations that is commensurate with their exposure to risk through the clearinghouse" but advocates that CCP boards include some directors elected by regulators to ensure systemic risk considerations are taken into account"; Turbeville, "Derivatives Clearinghouses," 13, which states: "At a minimum, the public's interest should be represented by membership on the risk committees of major clearinghouses. Regulatory representation, or representation by other public interest organization, would legitimize the process . . ."; Varney et al., letter to CFTC, 7, which calls for 100 percent independent directors on nominating committees and majority independent risk management and executive committees.

154. 7 U.S.C. § 7a-1(c)(2)(N)(2013). See also 15 U.S.C. § 78q-1(b)(3)(I)(2013): "The rules of the clearing agency do not impose any burden on competition not necessary or appropriate in furtherance of the purposes of this title."

155. As noted earlier, Craig Pirrong called for something similar with respect to risk management measures. Pirrong, "Economics of Central Clearing," 28–29, which calls for regulators to be able to revise membership requirements if the regulators "can show that they were adopted

for anti-competitive reasons, or place an undue burden on competition not justified by any prudential benefit."

156. The Supreme Court's reasoning for not allowing an antitrust suit to proceed in Credit Suisse v. Billing, which related to initial public offering underwriter syndicates, seems applicable here. 551 U.S. 264, 285 (2007). The court refused to apply antitrust law based on "the difficulty of drawing a complex, sinuous line separating securities-permitted from securities-forbidden conduct, the need for securities-related expertise to draw that line, the likelihood that litigating parties will depend upon the same evidence yet expect courts to draw different inferences from it, and the serious risk that antitrust courts will produce inconsistent results that, in turn, will overly deter syndicate practices important in the marketing of new issues."

157. Kroszner, "Central Counterparty Clearing," 40.

158. For thoughtful discussions of these issues, see Committee on Payments and Market Infrastructures and Board of the International Organization of Securities Commissions, Recovery of Financial Market Infrastructures (comments on the report are available at http://www.bis.org/cpmi/publ/comments/d109/overview.htm); Duffie, "Resolution of Failing Central Counterparties"; ISDA, "CCP Loss Allocation"; JPMorgan Chase, "What Is the Resolution Plan?"; LCH.Clearnet, "CCP Risk Management."

159. See Duffie, Li, and Lubke, "Policy Perspectives on OTC Derivatives," 2, which explains that "In 2005, the exponential growth of the credit derivatives market had outpaced the capabilities of dealers' processing systems, leading to large backlogs of unconfirmed trades. These unconfirmed trades had potentially uncertain legal statuses, often for lengthy periods of time, and limited the ability of dealers to accurately determine their counterparty exposures . . ."; Ledrut and Upper, "Clearing Post-Trading Arrangements," 92, which notes that "high access standards by CCPs can serve as a catalyst for improvements in back office processes."

160. See Dodd-Frank § 727 (adding 7 U.S.C. § 2a(13)(G)), which notes that "each swap (whether cleared or uncleared) shall be reported to a registered swap data repository," and § 729 (adding 7 U.S.C. § 6o-1(a)(1)), which allows uncleared swaps to be reported to the CFTC. (Parallel provisions exist for security-based swaps.)

161. Swap data repositories are defined in Dodd-Frank to mean "any person that collects and maintains information or records with respect to transactions or positions in, or the terms and conditions of, swaps entered into by third parties for the purpose of providing a centralized recordkeeping facility for swaps." Dodd-Frank § 721 (adding 7 U.S.C. § 1a(48)). Entities that meet this definition *must* register with the CFTC. Dodd-Frank § 728 (adding 7 U.S.C. § 24a(1)(A)). Allowing SDRs to choose whether to register would enable SDRs to choose to serve nonregulatory audiences without registering.

162. See Hayek, "Pretence of Knowledge": "The recognition of the insuperable limits to his knowledge ought indeed to teach the student of society a lesson of humility which should guard him against becoming an accomplice in men's fatal striving to control society—a striving which makes him not only a tyrant over his fellows, but which may well make him the destroyer of a civilization which no brain has designed but which has grown from the free efforts of millions of individuals."

REFERENCES

Acharya, Viral, Menachem Brenner, Robert Engle, Anthony Lynch, and Matthew Richardson. "Derivatives—the Ultimate Financial Innovation." In *Restoring Financial Stability: How to Repair a Failed Financial System,* edited by Viral Acharya and Matthew Richardson, 233–50. Hoboken, NJ: Wiley, 2009.

Allen, Julia Lees. "Derivatives Clearinghouses and Systemic Risk: A Bankruptcy and Dodd-Frank Analysis." *Stanford Law Review* 64 (2012): 1079–108.

Anderson, Ronald W., and Karin Jõeveer. "The Economics of Collateral." Discussion Paper No. 732, Financial Markets Group, May 2014.

Armakola, Angela, and Jean-Paul Laurent. "CCP Resilience and Clearing Membership." November 20, 2015. http://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID2693427_code1859873.pdf?abstractid=2625579&mirid=1.

Bailey, David. "The Bank of England's Perspective on CCP Risk Management, Recovery, and Resolution Arrangements." Speech at the Deutsche Boerse Group and Eurex Exchange of Ideas Conference, London, November 24, 2014.

Baker, Colleen M. "The Federal Reserve's Supporting Role behind Dodd-Frank's Clearinghouse Reforms." *Harvard Business Law Review Online* 3 (2013): 177–86.

Bank for International Settlements. "Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten Countries" (Lamfalussy Report). November 1990. http://www.bis.org/cpmi/publ/d04.pdf.

Bank for International Settlements, Committee on Payment and Settlement Systems and Technical Committee of the International Organization of Securities Commissions. "Recommendations for Central Counterparties." November 2004. http://www.bis.org/cpmi/publ/d64.htm.

Basel Committee on Banking Supervision. "Capital Requirements for Bank Exposures to Central Counterparties." April 2014. http://www.bis.org/publ/bcbs282.pdf.

Bernanke, Ben S. "Clearing and Settlement during the Crash." *Review of Financial Studies* 3 (1990): 133–51.

———. "Clearinghouses, Financial Stability, and Financial Reform." Speech at the 2011 Financial Markets Conference, Stone Mountain, GA, April 4, 2011.

Beylin, Ilya. "A Reassessment of the Clearing Mandate: How the Clearing Mandate Affects Swap Trading Behavior and the Consequences for Systemic Risk." Unpublished draft, May 18, 2015.

BlackRock. "Central Clearing Counterparties and Too Big to Fail." April 2014. https://www.blackrock.com/investing/literature/whitepaper/viewpoint-ccp-tbtf-april-2014.pdf.

Board of Governors of the Federal Reserve System, US Commodity Futures Trading Commission, and US Securities and Exchange Commission. "Risk Management and Supervision of Designated Clearing Entities." July 2011.

Braithwaite, Jo. "Legal Perspectives on Client Clearing." Law, Society, and Economy Working Paper 14, London School of Economics, 2015.

Carr, Gillian. "CCPs Mull Equity Swaps Clearing Solutions," *Risk.net*, March 20, 2015. http://www.risk.net/structured-products/news/2399385/ccps-mull-equity-swaps-clearing-solutions.

Chang, Felix B. "The Systemic Risk Paradox: Banks and Clearinghouses under Regulation." *Columbia Business Law Review* (April 2014): 747–816.

CME Group, DTCC, ICE, and OCC. Letter to Jacob L. Lew, Chairman, Financial Stability Oversight Council, March 9, 2015. https://www.theice.com/publicdocs/CME_DTCC_ICE_OCC_Letter.pdf.

Cœuré, Benoît. "Ensuring an Adequate Loss-Absorbing Capacity of Central Counterparties." Speech at the Federal Reserve Bank of Chicago 2015 Symposium on Central Clearing, April 10, 2015.

Cohn, Gary. "Clearing Houses Reduce Risk, They Do Not Eliminate It." *Financial Times*, June 22, 2015. http://www.ft.com/intl/cms/s/0/974c2c48-16a5-11e5-b07f-00144feabdc0.html?siteedition=intl#axzz3e1ggkHg4.

Committee on Payment and Settlement Systems and Technical Committee of the International Organization of Securities Commissions (CPSS/IOSCO). "Guidance on the Application of the 2004 CPSS-IOSCO Recommendations to OTC Derivatives CCPs." May 2010. http://www.iosco.org/library/pubdocs/pdf/IOSCOPD320.pdf.

———. "Principles for Financial Market Infrastructures." April 2012. http://www.bis.org/cpmi/publ/d101a.pdf.

Committee on Payments and Market Infrastructures and Board of the International Organization of Securities Commissions. Recovery of Financial Market Infrastructures. October 2014. http://www.bis.org/cpmi/publ/d121.pdf.

Culp, Christopher L. "OTC-Cleared Derivatives: Benefits, Costs, and Implications of the 'Dodd-Frank Wall Street Reform and Consumer Protection Act.'" *Journal of Applied Finance* 20 (2010): 1–27.

Domanski, Dietrich, Leonardo Gambacorta, and Cristina Picillo. "Central Clearing: Trends and Current Issues." *BIS Quarterly Review* (December 2015): 59–76.

Duffie, Darrell. "Financial Market Infrastructure: Too Important to Fail." Economics Working Paper 14101, Hoover Institution, January 2014.

———. "Resolution of Failing Central Counterparties." Stanford Graduate School of Business Working Paper 3256, December 17, 2014.

Duffie, Darrell, Ada Li, and Theo Lubke. "Policy Perspectives on OTC Derivatives Market Infrastructure." Federal Reserve Bank of New York Staff Report No. 424, revised March 2010.

Duffie, Darrell, and Haoxiang Zhu. "Does a Central Clearing Counterparty Reduce Counterparty Risk?" *Review of Asset Pricing Studies* 1 (2011): 74–95.

Duffy, Terrence A., Robert Druskin, Scott A. Hill, and Craig S. Donohue. Letter to Jacob J. Lew, Chairman, Financial Stability Oversight Council, March 9, 2015. http://www.optionsclearing.com/components/docs/about/press/comment-letters/20150309-FSOC.pdf.

Elliott, David. "Central Counterparty Loss-Allocation Rules." Financial Stability Paper No. 20, Bank of England, April 2013.

Evanoff, Douglas D., Daniela Russo, and Robert S. Steigerwald. "Policymakers, Researchers, and Practitioners Discuss the Role of Central Counterparties." In *The Role of Central Counterparties*, 6–25. European Central Bank and Federal Reserve Bank of Chicago Conference, July 2007.

FIA Europe. "A Review of the Cumulative Impact of European Derivatives Law Reform." June 2015. https://europe.fia.org/sites/default/files/content_attachments/FIA%20Europe_%20A%20review%20of%20the%20cumulative%20effect%20of%20European%20derivatives%20reform_Position%20Paper.pdf.

Financial Stability Board. "Implementing OTC Derivatives Market Reforms." October 25, 2010. http://www.fsb.org/2010/10/fsb-report-on-implementing-otc-derivatives-market-reforms/.

Financial Stability Oversight Council. "2016 Annual Report." Washington, DC.

Greenberger, Michael. "Diversifying Clearinghouse Ownership in Order to Safeguard Free and Open Access to the Derivatives Clearing Market." *Fordham Journal of Corporate and Financial Law* 18 (2013): 245–68.

Gregory, Jon. *Central Counterparties: Mandatory Clearing and Bilateral Margin Requirements for OTC Derivatives.* West Sussex: Wiley, 2014.

Griffith, Sean J. "Governing Systemic Risk: Towards a Governance Structure for Derivatives Clearinghouses." *Emory Law Journal* 61 (2012): 1153–240.

The Group of Twenty Leaders' Statement at the Pittsburgh Summit. September 24–25, 2009. http://www.treasury.gov/resource-center/international/g7-g20/Documents/pittsburgh_summit_leaders_statement_250909.pdf.

Hayek, Friedrich A. "The Pretence of Knowledge." Prize Lecture to the Memory of Alfred Nobel, December 11, 1974.

Heckinger, Richard, Ivana Ruffini, and Kirstin Wells. "Over-the-Counter (OTC) Derivatives." In *Understanding Derivatives*: *Markets and Infrastructure*, 27–38. Chicago: Federal Reserve Bank of Chicago, 2014.

Hills, Bob, David Rule, Sarah Parkinson, and Chris Young. "Central Counterparty Clearing Houses and Financial Stability." *Financial Stability Review* (June 1999): 122–34.

International Monetary Fund. "Making Over-the-Counter Derivatives Safer: The Role of Central Counterparties." In *Global Financial Stability Report: Meeting New Challenges to Stability and Building a Safer System*, 91–118. Washington, DC, 2010.

International Swaps and Derivatives Association. "CCP Loss Allocation at the End of the Waterfall." August 2013. https://www2.isda.org/attachment/NTc5Nw==/CCP_loss_allocation_waterfall_0807.pdf.

Johnson, Kristin N. "Commentary on the Abraham L. Pomerantz Lecture: Clearinghouse Governance: Moving beyond Cosmetic Reform." *Brooklyn Law Review* 77 (2012): 681–708.

———. "Governing Financial Markets: Regulating Conflicts." *Washington Law Review* 88 (2013): 185–244.

JPMorgan Chase. "What Is the Resolution Plan for CCPs?" *Perspectives*, September 2014. https://www.jpmorganchase.com/corporate/About-JPMC/document/resolution-plan-ccps.pdf.

Kelleher, Dennis M. Letter from President and CEO, Better Markets, to David A. Stawick, Secretary, CFTC, November 17, 2010. http://bettermarkets.com/sites/default/files/documents/CFTC-%20CL-%20Conflicts%20of%20Interest%20SEFs%2C%20DCOs%2011-17-10.pdf.

Knott, Raymond, and Alastair Mills. "Modelling Risk in Central Counterparty Clearing Houses: A Review." *Financial Stability Review* (December 2002): 162–74.

Kong, Kanga. "Trading Error Leaves Korean Broker Scrambling." *Wall Street Journal*, December 18, 2013. http://blogs.wsj.com/korearealtime/2013/12/18/trading-error-leaves-korean-broker-scrambling/.

Kroszner, Randall S. "Central Counterparty Clearing: History, Innovation, and Regulation." *Federal Reserve Bank of Chicago Economic Perspectives* (4th Quarter 2006): 37–41.

LCH.Clearnet. "CCP Risk Management, Recovery, and Resolution." November 7, 2014.

Ledrut, Elisabeth, and Christian Upper. "Clearing Post-Trading Arrangements for OTC Derivatives." *BIS Quarterly Review* (December 2007): 83–95.

Leising, Matthew. "Catastrophe Prevention Drives Pitch to Congress." *Bloomberg*, March 11, 2014. http://www.bloomberg.com/news/articles/2014-03-11/catastrophe-prevention-drives-insurance-pitch-to-clearinghouses.

Levitin, Adam J. "Response: The Tenuous Case for Derivatives Clearinghouses." *Georgetown Law Journal* 101 (2013): 445–66.

Lubben, Stephen J. "Failure of the Clearinghouse: Dodd-Frank's Fatal Flaw?" *Virginia Law and Business Review* 10 (2015): 150–51.

Massad, Timothy G. Keynote Address before the District of Columbia Bar, Washington, DC, July 23, 2015.

McBride, Paul M. "The Dodd-Frank Act and OTC Derivatives: The Impact of Mandatory Central Clearing on the Global OTC Derivatives Market." *International Lawyer* 44 (2010): 1077–22.

McPartland, John W. "Clearing and Settlement of Exchange Traded Derivatives." *Chicago Fed Letter* 267 (October 2009): 2.

Michel, Norbert J. "Financial Market Utilities: One More Dangerous Concept in Dodd-Frank." Heritage Foundation Backgrounder 3005, Washington, DC, March 20, 2015.

Moody's Investors Service. "Proposed Clearing House Rating Methodology." June 22, 2015. https://www.moodys.com/research/Proposed-Clearing-House-Rating-Methodology--PBC_181095.

Nosal, Ed. "Clearing Over-the-Counter Derivatives." *Federal Reserve Bank of Chicago Economic Perspectives* (4th Quarter 2011): 137–46.

Office of Financial Research. "2014 Annual Report."

Office of the Comptroller of the Currency. OCC's Quarterly Report on Bank Derivatives Activities Third Quarter 2015.

Parkinson, Patrick M. "CCP Liquidity Risk Management and Related Failure Management Issues." Speech to Federal Reserve Bank of Chicago Annual Over-the-Counter Derivatives Symposium, April 11, 2014.

Pirrong, Craig. "The Clearinghouse Cure." *Regulation* 44 (Winter 2008–2009): 44–51.

———. "The Inefficiency of the Clearing Mandate." Cato Policy Analysis, Washington, DC, July 21, 2010.

———. "The Economics of Central Clearing: Theory and Practice." ISDA Discussion Papers Series No. 1, International Swaps and Derivatives Association, May 2011.

———. "A Bill of Goods: Central Counterparties and Systemic Risk." *Journal of Financial Market Infrastructures* 2 (2014): 55–85.

Powell, Jerome H. "A Financial System Perspective on Central Clearing of Derivatives." Speech at the 17th International Banking Conference, Chicago, November 6, 2014.

"Q&A with Hal Scott of Harvard Law: Clearinghouse Ownership and Risk." *DerivAlert*. October 20, 2010. http://www.tradeweb.com/Blog/Q-A-With-Hal-Scott-of-Harvard-Law--Clearinghouse-Ownership-and-Risk/.

Quarry, Jason, Barrie Wilkinson, Toby Pittaway, and Jay Cheah. "OTC Derivatives Clearing: Perspectives on the Regulatory Landscape and Considerations for Policymakers." Oliver Wyman Report, May 31, 2012.

Rahman, Arshadur. "Over-the-Counter (OTC) Derivatives, Central Clearing and Financial Stability." *Bank of England Q3 Quarterly Bulletin* (2015): 283–95.

Report of the Presidential Task Force on Market Mechanisms. Washington, DC: Treasury Department, 1988.

Roe, Mark J. "Clearinghouse Overconfidence." *California Law Review* 101 (2013): 1641–704.

Rundle, James. "Helping Clearing Houses Avoid a Crash." *Financial News*, May 20, 2015. http://www.efinancialnews.com/story/2015-05-20/helping-rescuers-avoid-turbulence-clearing-houses.

Saltzman, Paul. Letter from President, The Clearing House Association LLC, to Jacob Lew, Chairman, Financial Stability Oversight Council (FSOC), January 9, 2015.

Scott, Hal. "The Reduction of Systemic Risk in the United States Financial System." *Harvard Journal of Law and Public Policy* 33 (2010): 671–734.

Shadow Financial Regulatory Committee. "The Dangers of Substituting Foreign Compliance for US Supervision of Financial Derivatives Activity." Statement No. 340, May 13, 2013.

Singh, Manmohan. "Making OTC Derivatives Safe—A Fresh Look." IMF Working Paper 11/66, International Monetary Fund, Washington, DC, 2011.

Squire, Richard. "Clearinghouses as Liquidity Partitioning." *Cornell Law Review* 99 (2014): 857–924.

Steigerwald, Robert S. "Central Counterparty Clearing." In *Understanding Derivatives—Markets and Infrastructure.* Chicago: Federal Reserve Bank of Chicago, 2013.

Stigler, George J. "The Theory of Economic Regulation." *Bell Journal of Economics and Management Science* 2 (1971): 3–21.

Swinburne, Kay. Speech before the World Federation of Exchanges/IOMA Conference, Sao Paulo, May 5, 2015.

Tarullo, Daniel K. "Advancing Macroprudential Policy Objectives." Speech at the Office of Financial Research and Financial Stability Oversight Council's Fourth Annual Conference on Evaluating Macroprudential Tools: Complementarities and Conflicts, Arlington, VA, January 30, 2015.

Tucker, Paul. "Counterparties in Evolving Capital Markets: Safety, Recovery and Resolution." *Banque de France Financial Stability Review* 17 (2013): 179–84.

———. "Are Clearing Houses the New Central Banks?" Speech at the Over-the-Counter Derivatives Symposium, Chicago, April 11, 2014.

Turbeville, Wallace C. "Derivatives Clearinghouses in the Era of Financial Reform." Conference Paper, Roosevelt Institute, New York, 2010.

US Commodity Futures Trading Commission. Transcript of the Public Roundtable on Futurization of Swaps, Washington, DC, January 31, 2013. http://www.cftc.gov/idc/groups/public/@swaps/documents/dfsubmission/dfsubmission13_013113-trans.pdf.

US Commodity Futures Trading Commission and US Securities Exchange Commission. "A Joint Report of the SEC and the CFTC on Harmonization of Regulation." October 16, 2009.

———. Transcript of the Public Roundtable on Governance and Conflicts of Interest in the Clearing and Listing of Swaps, Washington, DC, August 20, 2010. http://www.cftc.gov/idc/groups/public/@swaps/documents/dfsubmission/dfsubmission9_082010.pdf.

Vaghela, Viren. "Korea Clearing Structure in Question after HanMag Trading Error." *Risk.net*. March 5, 2014. http://www.risk.net/asia-risk/feature/2331225/korea-clearing-structure-in-question-after-hanmag-trading-error.

Varney, Christine A., Carl Shapiro, Gene I. Kimmelman, James J Tierney, Scott A. Scheele, Ihan Kim, Robert A. Potter, Samuel N Weinstein, Jeffrey M. Wilder, Charles S. Taragin, and Fan Zhang. Letter from Department of Justice, Assistant Attorney General to US Commodity Futures Trading Commission, December 28, 2010. http://comments.cftc.gov/PublicComments/ViewComment.aspx?id=26809&SearchText.

Wendt, Froukelien. "Central Counterparties: Addressing Their Too Important to Fail Nature." IMF Working Paper 15/21, International Monetary Fund, Washington, DC, January 2015.

Wetjen, Mark P. "Ensuring the Promise of a Centrally Cleared, Global Swaps Market: Next Steps." Remarks before the Futures Industry Association Asia Derivatives Conference, Singapore, December 4, 2014.

Wibaut, Serge, and D. Sykes Wilford. "Markets for CCPs and Regulation: Considering Unintended Consequences." *The Capco Institute Journal of Financial Transformation* 34 (2012): 103–17.

Wolkoff, Neal L., and Jason B. Werner. "The History of Regulation of Clearing in the Securities and Futures Markets and Its impact on Competition." *Review of Banking and Financial Law* 30 (2010–2011): 313–81.

Yellen, Janet L. "Interconnectedness and Systemic Risk: Lessons from the Financial Crisis and Policy Implications." Remarks at the American Economic Association/American Finance Association Joint Luncheon, San Diego, CA, January 4, 2013.

Yi, Whan-woo. "HanMag Debacle Hits Brokerages." *Korea Times*, December 17, 2013. http://koreatimes.co.kr/www/news/biz/2013/12/602_148108.html.