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Using Central Counterparties to Limit Global Financial Crises

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USING CENTRAL COUNTERPARTIES TO LIMIT GLOBAL FINANCIAL CRISES

*Christoph Henkel*¹

“So, my odds are good. I am on a winning streak. Everybody wants to get in on the action. How can I lose, right?” Selena Gomez, The Big Short (2015).²

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1. Professor of Law, Mississippi College School of Law. *Assessor iuris*, University of Wisconsin, LL.M., S.J.D. Professor Henkel teaches Banking Law, Financial Compliance, Bankruptcy, Business and Commercial Law. The article benefitted from comments from Professors Jay Westbrook, Bruce A. Markell, Adrian Walters, Jason Kilborn, Andrew Dawson, Susan Block-Lieb and Sarah Paterson. Finally, the author would also like to thank Professor Randall K. Johnson for his help and the support provided by the organizers of the Symposium on Comparative and Cross-Border Issues in Bankruptcy and Insolvency Law at the Illinois Institute of Technology, Chicago-Kent College of Law.

2. THE BIG SHORT (Paramount Pictures 2015).

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I. INTRODUCTION

Conventional economic analysis assumes that Central Counterparties (CCPs) may help to reduce systemic risk and avoid future financial crises by mandating the central clearing of over-the-counter (OTC) derivatives. This view largely goes unchallenged by governments, regulators, practitioners, and many international standard setting bodies. But if this assumption is correct, why are we increasingly confronted with the potential failure of CCPs? Why do these potential failures threaten significant spillover and cascade effects, which may cause financial crises rather than preventing them? This article attempts to provide a compelling explanation for these negative effects.

In this article, I question the received wisdom about the role that CCPs play in preventing financial crises. I further challenge the conventional view about how counterparties should be used by focusing on CCP recovery and resolution mechanisms in the U.S. context. This article analyzes why the current approach, which assumes that CCPs serve as financial risk mitigators, is problematic and may cause future global financial crises.

As a result, this article asks and answers four main questions. First, what are the consequences of using central clearing, especially after the Great Recession, and what impact does this approach have in the United States? Second, what effect do interconnections in central clearing have on risk mitigation in the global financial system? Third, do we have the appropriate tools to intervene if a CCP, or several interconnected CCPs, becomes insolvent? Lastly, are there any recent developments that would strengthen the benefits of central clearing and the CCP model?

This article argues that the central clearing mandate of OTC derivatives, meant to eliminate or at least reduce the moral hazard of too-big-to fail, has instead concentrated risk and made CCPs less safe and effective in the U.S. context. The failure of one major systemically important and interconnected CCP may trigger cascade effects through global financial markets, making a public bailout all but a certainty. In comparison to what happened with Lehman Brothers or AIG, the bailout of a major interconnected CCP may be of such epic proportions that it dwarfs all earlier bailouts in terms of its size and magnitude.

Within this context, it is surprising that one of the largest derivative

markets by volume, the United States, has not implemented any uniform or effective recovery or resolution mechanism to address a catastrophic failure of any major CCP. In addition to CCPs, the networks these institutions rely on to conduct their business may also need to be considered as systemically important. Indeed, the existence and essential nature of these networks may accelerate and exacerbate cascade effects.

The European Commission's proposal for a regulation on a framework for the recovery and resolution of CCPs³ may serve as an example on how to create a more functional recovery system in the United States. But because of the immense volume of derivative contracts currently and increasingly being cleared by only a handful of global and interconnected CCPs, it is unclear if any resolution or bankruptcy system can ever fully prevent a public bailout in this context.⁴ In fact, it seems fair to argue that each of the major CCPs may not be too-big-to-fail, but rather *too-big-to-bail*.

This article is not exhaustive and does not discuss internal risk mutualization at CCPs, nor other ex-ante prudential measures to reduce the impact of default by any number of clearing members.⁵ Rather, this article focuses on the much greater systemic risk of cascade effects resulting from extreme tail events.⁶ The reason is that this type of risk may overwhelm any internal liquidity facility and trigger a CCP to become insolvent overnight.⁷

3. *Commission Proposal for a Regulation of the European Parliament and of the Council on a Framework for the Recovery and Resolution of Central Counterparties and Amending Regulations* (EU No 1095/2010, (EU) No 648/2012, and (EU) 2015/2365, COM (2016) 856 final (Nov. 28, 2016); see also *Commission Staff Working Document, Impact Assessment Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on a Framework for the Recovery and Resolution of Central Counterparties and amending Regulations* (EU) No 1095/2010, (EU) No 648/2012, and (EU) 2015/2365, SWD (2016) 368 final, (Nov. 28, 2016).

4. See, e.g., Adam J. Levitin, *Bankruptcy's Lorelei: The Dangerous Allure of Financial Institution Bankruptcy*, 97 N. C. L. REV. 243 (2019) ("A successful bankruptcy is not possible for a large financial institution absent massive financing for operations while in bankruptcy, and that financing can only reliably be obtained on short notice and in distressed credit markets from one source: the United States government.").

5. CCPs currently are only required to be able to either withstand the default of the clearing member to which it has the largest exposures or of the second and third largest clearing members, if the sum of their respective exposures are larger (Cover-2). See, e.g., European Union Regulation 648/2012, 2012 O.J. (L 201); see also David Murphy & Paul Nahai-Williamson, *Dear Prudence, won't you come out to play? Approaches to the analysis of central counterparty default fund adequacy*, 30 BANK OF ENGLAND, FINANCIAL STABILITY PAPER 7 (arguing that the 'cover 2' measure is arbitrary), <https://www.bankofengland.co.uk/-/media/boe/files/financial-stability-paper/2014/dear-prudence-wont-you-come-out-to-play-approaches-to-the-analysis-of-ccp-default-fund-adequacy.pdf>.

6. See, e.g., Darrell Duffie, *Resolution of Failing Central Counterparties* 3 (Stanford Graduate Sch. of Bus., Working Paper No. 3256, 2014) (arguing that the failure of a major CCP could occur during periods of extreme market events); see also Darrell Duffie & Haoxiang Zhu, *Does a Central Clearing Counterparty Reduce Counterparty Risk?*, 1 REVIEW OF ASSET PRICING STUDIES 74- 95 (2011).

7. See, e.g., Mark J. Roe, *Clearinghouse Overconfidence*, 101 CALIF. L. REV. 1641, 1649 (2013); see also Russell Barker, Andrew Dickinson, Alex Lipton & Rajeev Virmani, *Systemic Risks in CCP*

CCPs continue to be widely misunderstood and are often compared to banks. This article will provide some needed context about CCPs, the products they clear, and how they operate. In Part II, this article will address the importance of interconnectedness of CCPs and the growing number of clearing member networks. In Part III, the article will then focus on the possible failures of CCPs. Specifically, it will analyze several examples of prior failures or near failures of CCPs and a few different default and non-default events will also be discussed. Part IV outlines the objectives of CCP recovery and resolution mechanisms, including an analysis of shortcomings of presently available recovery and resolution procedures in the United States. Finally, in Part V, this article concludes by discussing various proposals on how to avoid the threat of a systemic risk through new forms of intermediation, CAT bonds, and systemic risk taxation or surcharges.

II. POSITIVE ANALYSIS

Broadly defined,⁸ a Central Counterparty (CCP) is “an entity that interposes itself between the counterparties to trades, acting as the buyer to every seller and the seller to every buyer.”⁹ CCPs, in other words, are intermediaries that pool the risk of default for all clearinghouse members.¹⁰ These goals are achieved by maintaining a matched book of positions, which requires the offsetting of assets and liabilities. This offsetting occurs through margining and netting.¹¹

Networks at 14 (2016) (“[T]ail losses and increased liquidity requirements require a careful modeling so as to capture the substantial wrong-way risk between volatility of market variables and defaults”).

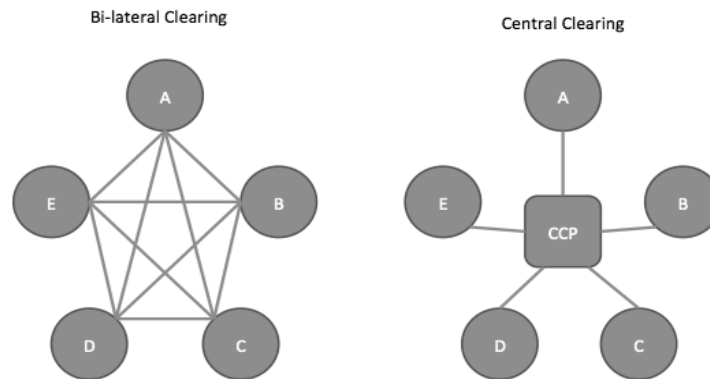
8. See, e.g., Rebecca Lewis, *Taking a deep dive into margins for cleared derivatives*, CHICAGO FED LETTER NO. 371 (2016).

9. Committee on Payments and Settlement Systems (CPSS) and Technical Committee of the International Organization on Securities Commissions (IOSCO), *Principles for financial market infrastructures*, Bank of International Settlements and International Organization on Securities Commissions 8 (2012).

10. The “pooling” occurs through mutualization and not through risk pooling or diversification as typical insurance mechanisms. All clearing members “remain contingently responsible for mutualizing losses in the event any of the clearing members defaults.” And, this loss mutualization must be understood as a “means by which members of a clearinghouse (and other clearing associations) provide ‘self-insurance’ for their activities.” Robert T. Cox & Robert S. Steigerwald, *A CCP is a CCP is a CCP*, FEDERAL RESERVE BANK OF CHICAGO, POLICY DISCUSSION PAPER VOL. PDP, NO 2017-01 at 8 (2017). In other words, through mutualization clearing members insure each other and themselves in case of default. The risk of default is therefore shared among all clearing members.

11. See, e.g., Fernando Cerezetti, Jorge Cruz Lopez, Mark Manning & David Murphy, *Who pays? Who gains? Central counterparty resource provisions in the post Pittsburgh world*, 7 JOURNAL OF FINANCIAL MARKET INFRASTRUCTURES 12-15 (2019); see also Robert T. Cox & Robert S. Steigerwald, *A CCP is a CCP is a CCP*, FEDERAL RESERVE BANK OF CHICAGO, POLICY DISCUSSION PAPER VOL. PDP, NO 2017-01 at 5 (2017); Mark Jozsef Manning & David Hughes, *Central counterparties and banks: vive la difference*, 4 JOURNAL OF FINANCIAL MARKET INFRASTRUCTURE 3 (2016) (“In the absence of a default, the CCP operates with a ‘matched book.’”). For a more comprehensive discussion see also Sect. II.B.3.

Margining may be the CCP's most important tool to manage default risk.¹² Until a derivative contract is closed out, margining requires that each counterparty places a predetermined portion of each trade's value in a CCP account.¹³ Netting, on the other hand, is the right to offset payments that an institution has to make and is entitled to receive, allowing the combination of multiple cash flows into one single net payment.¹⁴



Through the pooling of risk and the sharing of potential losses as between clearing members, the probability of insolvency is reduced at the individual and group levels.

The following in-depth discussion of some of the most important aspects of how CCPs function is meant to provide a better understanding of these institutions and explain how CCPs may be able to limit cascade effects in derivative markets.

12. PETER NORMAN, THE RISK CONTROLLERS: CENTRAL COUNTERPARTY CLEARING IN GLOBALISED FINANCIAL MARKETS 10-12 (2012).

13. *Id.*

14. *See, e.g.*, JON GREGORY, CENTRAL COUNTERPARTIES: MANDATORY CLEARING AND BILATERAL MARGIN REQUIREMENTS FOR OTC DERIVATIVES 60-73 (Wiley 2014) (Noting that netting has been critical for the growth of derivative markets by reducing the overall credit exposure in the markets when compared to notional value of these markets). However, netting is not without drawbacks, because it can negatively impact the dynamics and liquidity of derivative markets. For example, while the overall size of credit exposure may be smaller, the netted positions tend to be much more volatile than the underlying gross positions. This difference in itself may create a significant systemic risk. *Id.* Netting and offset, of course, also make it much more difficult for participants to move in and out of various positions and particularly if some of the positions create different risk exposures. *Id.* It is true that some of this downside risk does not extend into multilateral netting, which maybe one of the main arguments in favor a the central clearing mandate described in this article, but multilateral netting might instead result in a less transparent market due to the fragmentation of positions, which are either non-clearable or clearable trades. *Id.* at 71-73.

A. Derivative Transactions Defined

Generally speaking, derivative contracts are agreements between two or more counterparties.¹⁵ Counterparties are the opposing parties in a derivative transaction.¹⁶ In other words, counterparties represent the buyers and sellers in these financial instruments and can be individual persons or any corporate legal entity.

Most derivative contracts are traded by large derivative dealers as counterparties, including Citigroup Inc. and JP Morgan Chase & Co.¹⁷ Other major derivative dealers may include Bank of America, HSBC, and Goldman Sachs.¹⁸ Also, large energy companies such as Royal Dutch Shell, BP, and Vitol may serve as major derivative dealers.¹⁹

All derivative contracts may be customized to meet the needs of the particular parties and typically draw their value from the underlying reference item the counterparties wish to use.²⁰ For example, commodities such as sugar or pork bellies can be chosen as the reference item that determines the initial value of the contract.²¹ Other potential

15. See generally ANDREW CHISHOLM, *DERIVATIVES DEMYSTIFIED: A STEP-BY-STEP GUIDE TO FORWARDS, FUTURES, SWAPS AND OPTIONS 1* (2d ed. 2010).

16. *Id.*

17. See, e.g., Dakin Campbell, *Citigroup overtakes JP Morgan as Top U.S. Derivative Dealers*, BLOOMBERG NEWS (June 29, 2015), <https://www.bloomberg.com/news/articles/2015-06-29/citigroup-overtakes-jpmorgan-as-biggest-u-s-derivatives-dealer> [<https://perma.cc/X8QN-X24Z>]; see also Satyajit Das, *Q&A Regulation and the derivative markets*, FIN. TIMES (June 7, 2010), <https://www.ft.com/content/833a0994-6e32-11df-ab79-00144feabdc0> [<https://perma.cc/7V3G-HJSZ>]; Bank for International Settlements, *Statistical Release – OTC Derivatives Statistics at end-June 2016, Monetary and Economic Department 4* (Nov. 2016), https://www.bis.org/publ/otc_hy1611.pdf [<https://perma.cc/C43Y-EE8B>]; International Swaps and Derivatives Association, *ISDA Margin Survey 2017* (Sept. 2017), <https://www.isda.org/a/VeiDE/margin-survey-final1.pdf> [<https://perma.cc/3XMN-53LX>].

18. See, e.g., *Federal Reserve Bank of New York, Markets & Policy Implementation, Counterparties, List of Primary Dealers*, <https://www.newyorkfed.org/markets/primarydealers> [<https://perma.cc/KWQ8-KLDJ>] (last visited Mar. 20, 2018).

19. See, e.g., Alexandra Alper & Sarah N. Lynch, *Regulators spare all but the biggest swap dealers*, REUTERS BUSINESS NEWS (Apr. 18, 2012), <https://www.reuters.com/article/us-financial-regulation-swaps/regulators-spare-all-but-biggest-swap-dealers-idUSBRE83H0YE20120418> [<https://perma.cc/V4MT-LKAE>].

20. See, e.g., MICHAEL DURBIN, *ALL ABOUT DERIVATIVES 3* (2nd ed. 2011).

21. *Id.* at 11

referents are the weather, cryptocurrencies,²² indexes or money.²³

While complex in nature, all derivative contracts are nevertheless simply a variation of only four basic agreement types: the forward, future, swap, or options contract.²⁴ A forward is a contract in which a buyer agrees to purchase the underlying unit from the seller at a specified price on a specified future date.²⁵ A future is nothing more than a standardized forward contract, which is traded on an exchange.²⁶ The exchange is a regulated trading platform providing better guarantees to counterparties that contract obligations will be fulfilled.²⁷ A swap, on the other hand, is an agreement used to exchange cash flows and most often involves interest payments.²⁸ In a swap, the cash flow of the first counterparty is based on a variable floating rate, while the cash flow of the second counterparty is based on a fixed rate.²⁹ Finally, an option is an agreement that grants the holder the right, but not the obligation, to sell or buy something at a specific price on or before a specific future date.³⁰ Options are also primarily traded on exchanges.³¹

In addition to the basic agreement types, OTC derivatives are further divided into at least five broad groups: interest rate derivatives, foreign

22. See, e.g., Boris Groendahl, Donal Griffin & Silla Brush, *Crypto Derivatives targeted by EU regulator weighing curbs*, BLOOMBERG BNA, SECURITIES DAILY (Jan. 19, 2018), <https://www.bloomberg.com/news/articles/2018-01-18/cryptocurrency-derivatives-may-fall-under-eu-retail-sales-curbs> [https://perma.cc/3FJK-BT5L]; see also De Nikhilesh, *ESMA Seeks Public Input on Cryptocurrency Derivatives Policy*, COINDESK (Jan. 18, 2018), <https://www.coindesk.com/esma-calls-for-public-input-on-crypto-based-derivatives-contracts/> [https://perma.cc/M28L-VNE2]; European Securities and Market Authority (ESMA), *Statement on preparatory work of the European Securities and Markets Authority in relation to CFDs, binary options and other speculative products*, ESMA35-36-885 (June 29, 2017), <https://www.esma.europa.eu/document/product-intervention-general-statement> [https://perma.cc/2EB9-ZWH8]; European Securities and Market Authority (ESMA), *ESMA issues updated statement on preparatory work of the European Securities and Markets Authority in relation to CFDs, binary options and other speculative products* (Dec. 15, 2017), <https://www.esma.europa.eu/press-news/esma-news/esma-issues-updated-statement-preparatory-work-in-relation-cfds-binary-options> [https://perma.cc/EVE4-25BX]; European Securities and Market Authority (ESMA), *Call for evidence: Potential product intervention on contracts for difference and binary options to retail customers*, ESMA35-43-904 (Jan. 18, 2018), https://www.esma.europa.eu/sites/default/files/library/esma35-43-904_call_for_evidence_-_potential_product_intervention_measures_on_cfds_and_bos_to_retail_clients.pdf [https://perma.cc/6VB7-Y9D7].

23. See, e.g., JOHN E. MARTHINSEN, *RISK TAKERS: USES AND ABUSES OF FINANCIAL DERIVATIVES 1-4* (2d ed. 2009).

24. See, e.g., ANDREW CHISHOLM, *DERIVATIVES DEMYSTIFIED: A STEP-BY-STEP GUIDE TO FORWARDS, FUTURES, SWAPS AND OPTIONS 1-2* (2d ed. 2010).

25. See, e.g., MICHAEL DURBIN, *supra* note 20, at 23.

26. *Id.*

27. *Id.* at 6-7.

28. *Id.* at 29.

29. *Id.* at 30.

30. *Id.* at 37-39.

31. *Id.* at 2.

exchange derivatives, equity derivatives, commodities derivatives, and credit derivatives.³²

While not the biggest group based on outstanding notional value, credit default swaps (CDSs), a group of credit derivatives, carry a much higher risk due to their long-term nature and exposure to market factors.³³ As such, CDS derivatives may disproportionately contribute to a higher counterparty risk in derivative markets and the systemic risk in financial markets. CDSs have also played one of the most important roles in the lead up to and during the financial crisis.³⁴

CDSs were introduced in the 1990s as an insurance mechanism for commercial debt and corporate bonds,³⁵ which later extended to include mortgage-backed bonds.³⁶ At the end of 2008, the outstanding notional amount of CDSs reached \$38.6 trillion,³⁷ and in the first quarter of 2009, the notional amount of derivatives held by U.S. commercial banks was approximately \$202 trillion, with \$14.6 trillion in CDSs as the third largest category of derivatives.³⁸

By the end of 2009, and as a direct reflection of the reduction in market prices, the total gross market value fell by as much as a third, to \$21.6 trillion.³⁹ Since then, the CDS market initially grew at a moderate pace with a notional value of \$26.3 trillion at mid-year 2010, but fell to \$19 trillion in 2014.⁴⁰ In 2015, the total outstanding notional value dropped to \$12.3 trillion of total CDS contracts with a gross market value of \$421 billion and a net market value of \$113 billion.⁴¹

32. See, e.g., GREGORY, *supra* note 14, at 18.

33. *Id.*; see also Kouki Inamura, Akio Hattori, Yoshiyuki Fukuda, Yoshihiko Sugihara & Yuki Teranishi, *Wrong-way risk in OTC derivatives and its implication for Japan's financial institutions*, 2012-E-6 BANK OF JAPAN REV. 1-2 (2012), https://www.boj.or.jp/en/research/wps_rev/rev_2012/data/rev12e06.pdf [<https://perma.cc/KH8M-JEQ9>].

34. Michael Greenberg, *The Role of Derivatives in the Financial Crisis*, Financial Crisis Inquiry Commission Hearing 11 (June 30, 2010) (Testimony of Michael Greenberger, Law Sch. Professor, Univ. of Maryland Sch. of Law) (“It is now almost universally accepted that the unregulated multi-trillion dollar OTC CDS market helped formant a mortgage crisis, and finally the ‘once-in-a-century’ systemic financial crisis...”), http://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=1036&context=cong_test [<https://perma.cc/3F4K-2BW3>].

35. See, e.g., PAUL C. HARDING, A PRACTICE GUIDE TO THE 2003 ISDA CREDIT DERIVATIVES DEFINITIONS 2-3 (2004).

36. See, e.g., DURBIN, *supra* note 20, at 204-206.

37. *Summaries of Market Survey Results*, INT’L SWAPS & DERIVATIVES ASS’N, [https://www.isda.org/attachment/ISDA Market Surveys 2010-1995](https://www.isda.org/attachment/ISDA%20Market%20Surveys%202010-1995) [<https://perma.cc/3HFD-AGXC>].

38. See, e.g., COMPTROLLER OF THE CURRENCY, ADM’R OF NAT’L BANKS, OCC’S QUARTERLY REPORT ON BANK TRADING AND DERIVATIVES ACTIVITIES: FIRST QUARTER 2009 (2009).

39. See, e.g., *Commission Staff Working Document*, *supra* note 3, at 12.

40. Bank of International Settlements, Monetary Economic Department, *Statistical Release OTC Statistics at the end-June 2014*, 5 (Nov. 2014), http://www.bis.org/publ/otc_hy1411.pdf [<https://perma.cc/N7GB-K9FV>].

41. Bank of International Settlements, *Semiannual OTC derivative statistics (OTC, credit default*

This downward trend continued through 2016; by 2017, the outstanding notional value fell below \$10 trillion, which is the lowest level since 2007.⁴² However, at the same time, the centrally cleared segment of CDS markets rose from \$4.3 to \$4.9 trillion or from 44% to 51% between December 2016 and June 2017.⁴³ Today, the CDS market remains the third largest derivative category behind interest and foreign exchange derivatives.⁴⁴

In a CDS contract, creditworthiness is the underlying pricing mechanism, effectively making credit risk a tradable product. Under this set-up, the first counterparty, in return for a premium payment, promises to make a payment to the other counterparty if a third-party defaults on her debt obligation.⁴⁵ As such, it provides credit default protection and compensates the protection buyer in case of loss or default.

Compensation may take place based on a settlement method previously agreed upon by the counterparties. The compensation is typically a form of cash or physical settlement.⁴⁶ The protection seller may either take physical delivery of the credit-impaired securities at a previously agreed price or may pay the difference between the price and the securities' current market value in cash.⁴⁷ Today, an auction settlement is the principal method of settlement of credit derivatives.⁴⁸

While somewhat similar to an insurance contract,⁴⁹ CDS contracts are at the same time very different because their payout is generally independent from any actual loss.⁵⁰ Settlement is due when a credit event occurs, regardless of whether the protection buyer suffers or even risks

swaps, by type and position) 32 (Nov. 2016), https://www.bis.org/publ/otc_hy1611.pdf [<https://perma.cc/5BKF-92K3>]; see also EDMUND PARKER, CREDIT DERIVATIVES: UNDERSTANDING AND WORKING WITH THE 201 ISDA CREDIT DERIVATIVES 7 (2017).

42. Bank of International Settlement, *Statistical Release: OTC derivative statistics at end-June 2017*, 5 (Nov. 2, 2017), https://www.bis.org/publ/otc_hy1711.pdf [<https://perma.cc/YWS6-ZT7R>].

43. *Id.*

44. *Id.* The 2014 overall decline in CDS activity primarily contributed to the continuing contraction in inter-dealer activity and an increase in trade compression. *Id.* Compression is a process for tearing up trades, which enables economically redundant derivative trades to be terminated early without changing each participant's net position. For statistics on multilateral compressions of CDS contracts. See, e.g. Chicago Mercantile Exchange, *Portfolio Compression*, TRIOPTIMA, www.trioptima.com/resource-center/statistics/triReduce.html [<https://perma.cc/3J37-8MC4>].

45. JOHN-PETER CASTAGNINO, DERIVATIVES: THE KEY PRINCIPLES 86 (3rd ed. 2009).

46. See, e.g., GREGORY, *supra* note 14, at 27.

47. Oskari Juurikkala, *Credit Default Swaps and Insurance: Against the Potts Opinion*, 26 J. INT'L BANKING L. & REG. 128, 128 (2011) (arguing that CDS contracts in some cases may be construed as insurance contracts).

48. See, e.g., PARKER, *supra* note 41, at 381.

49. See, e.g., Arthur Kimball-Stanley, *Insurance and Credit Default Swaps: Should Like Things Be Treated Alike*, 15 CONN. INS. L.J. 241, 246-47 (2008).

50. HARDING, *supra* note 35, at 19; see also *Lloyds & Scottish Fin. Ltd. v. Cyril Lord Carpets Sales Ltd.*, [1992] B.C.L.C. 609.

suffering a loss.⁵¹ Credit events triggering a settlement are usually also much broader than those in insurance contracts.⁵²

The most common credit events triggering contract termination and settlement are failure to pay, bankruptcy, and restructuring.⁵³ In order to ensure the optimal level of protection, the typical termination clause establishes default even before any credit event occurs or before formal bankruptcy or restructuring proceedings are initiated.⁵⁴ For example, in the ISDA Master Agreement, which is the standard master agreement of most credit derivatives in the United States and Europe, default is assumed if a reference entity “makes a general assignment, arrangement or composition with or for the benefit of its creditors”⁵⁵ or “seeks or becomes subject to the appointment of an administrator, provisional liquidator, conservator, receiver, trustee, custodian or other similar official for it or for all or substantially all its assets.”⁵⁶ This already very broad definition is further supplemented by a catchall clause establishing a termination right if a party causes any event that has an analogous or equivalent effect to bankruptcy.⁵⁷

B. Organization and Role of Central Counterparties

So, what is clearing and how does it function in the context of derivative transactions? The concept of clearing OTC derivatives or the use of CCPs are not a particularly new development or idea. The concept of CCPs emerged in the 18th century to neutralize counterparty risk in commodity markets and has significantly evolved since then.⁵⁸

51. HARDING, *supra* note 35, at 19.

52. *Id.* at 18-19.

53. *Id.* at 6; *see also*, PARKER, *supra* note 41, at 337-48 (describing the most common seven credit events as bankruptcy, obligation acceleration, obligation default, failure to pay, repudiation, moratorium, restructuring and government intervention).

54. *See, e.g.*, Wachovia Bank Nat'l. Ass'n and Novastar Mortg. Supplemental Interest Trust, Int'l Swap Dealers Ass'n, Inc., Master Agreement § 4(a)(vii)(3) (May 27, 2005) [hereinafter Master Agreement], <http://www.sec.gov/Archives/edgar/data/1328469/000119312505124580/dex105.htm> [<https://perma.cc/7J7W-2QW8>]; HARDING, *supra* note 35, at 109; *see also* Jens-Hinrich Binder, *Bankenintervention und Bankenabwicklung in Deutschland: Reformnotwendigkeiten und Grundzüge eines verbesserten Rechtsrahmens* 17–18 (Sachverständigenrates zur Begutachtung der Gesamtwirtschaftlichen Entwicklung, Working Paper No. 05/2009, 2009) (Ger.), http://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/Arbeitspapiere/Bankenintervention_und_Bankenabwicklung_in_Deutschland.pdf [<https://perma.cc/24F2-HMF2>] (arguing that this is already the case, and most default clauses in derivative contracts are structured to allow for pre-bankruptcy termination). One reason for these early termination rights is clearly to avoid any potential conflict with differing national insolvency rules.

55. Master Agreement, *supra* note 54, § 4(a)(vii)(3).

56. *Id.* § 4(a)(vii)(6).

57. *Id.* § 4(a)(vii)(8).

58. PETER NORMAN, *THE RISK CONTROLLERS: CENTRAL COUNTERPARTY CLEARING IN GLOBALISED FINANCIAL MARKETS* 7 (2012).

In addition to basic clearing services, CCPs today provide many additional services that are considered to add significant value to derivative trades by reducing counterparty default risk.⁵⁹ Typically, two different CCP structures are distinguished: a vertical CCP or a horizontal CCP structure. Vertically structured CCPs are integrated parts of a corporate entity, group, or exchange and may only be used by members or users of that entity.⁶⁰ Horizontally structured CCPs are user-owned and user-governed; they are institutionally separated from any trading platform while also serving multiple markets and processing many different asset classes.⁶¹

In the European Union, which has a common economic market, all CCPs are considered to offer system-level stability.⁶² The United States takes a similar approach. The difference is that in the European Union, CCPs are automatically viewed as risk-minimizers, whereas in the U.S. they must be so designated.⁶³

The status of CCPs in derivative markets remains unclear and is often confused with other types of clearinghouses. To be clear, what is required of CCPs is context-specific and depends upon the needs of their members.⁶⁴ For example, in terms of financial services, central clearing may only require the balancing of debt or the processing of payment instruments or currency.⁶⁵ Yet, as far as securities trades are concerned, central clearing only requires standard operational processes.⁶⁶ This is very different from what is required in derivative markets.⁶⁷ In this case, when derivative contracts are traded, no additional performance is required under these contracts once they are settled or extinguished.⁶⁸

Each CCP performs its duties through the discharge of contractual

59. TINA P. HASENPUSCH, *CLEARING SERVICES FOR GLOBAL MARKETS: A FRAMEWORK FOR THE FUTURE DEVELOPMENT OF THE CLEARING INDUSTRY* 37 (Cambridge University Press 2009); Kirsi, *Central Counterparty Clearing: Constructing a Framework for Evaluation of Risks and Benefits*, BANK OF FINLAND, DISCUSSION PAPER, 30/2004 at 14.

60. NORMAN, *supra* note 58, at 17.

61. *Id.* at 18.

62. See, e.g., Emanuel Alfranseder, Paweł Fiedor, Sarah Lapschies, Lucia Orszaghova & Paweł Sobolewski, *Indicators for the monitoring of central counterparties in the EU*, 14 EUROPEAN SYSTEMIC RISK BOARD, OCCASIONAL PAPER SERIES 12 (2018), <https://www.esrb.europa.eu/pub/pdf/occasional/esrb.op14.en.pdf> [<https://perma.cc/DU8C-GXRN>].

63. *Board of Governors of the Federal Reserve System, Designated Financial Market Utilities*, https://www.federalreserve.gov/paymentsystems/designated_fm_u_about.htm [<https://perma.cc/H6AE-VL2J>].

64. HASENPUSCH, *supra* note 59, p. 17-18.

65. *Id.* at 18

66. *Id.*

67. See, e.g., GREGORY, *supra* note 14, at 9.

68. HASENPUSCH, *supra* note 59, p. 18 (Noting that “[i]n the trading of derivatives, the legal obligation is fulfilled when the duration of a contract expires or when a close-out of positions occurs (i.e. an offsetting sell contract for the holder of a buy contract is entered into and vice versa).”).

obligations, including (1) novation, (2) netting, (3) risk management/monitoring, or (4) collateral management. The following sections explain how CCPs carry out these contractual duties.

1. Novation

Novation may be the most essential and important service provided by a CCP and the service that best describes its functions. Novation refers to the process of replacing one contract party with another.⁶⁹ For example, if A and B are the original counterparties to a derivative trade, the CCP will replace A as the counterparty to B and B as the counterparty to A. The original bilateral contractual obligation between A and B are replaced with an obligation of the CCP. The CCP then becomes liable on the contractual obligation to perform on both the buyer's and the seller's side at the same time.⁷⁰ The CCP also automatically assumes the more one-dimensional bilateral counterparty risk of default and replaces that risk with that of a much higher quality risk that is backed by the CCP, all of its clearing members, and its users.

2. Netting

Netting is also aimed at reducing counterparty risk.⁷¹ By definition, netting is the process by which counterparties consolidate and reduce the overall number of their outstanding derivative positions.⁷² Positions that share the same underlying reference unit and attributes are partially or completely offset and consolidated into one single obligation.⁷³

Two types of netting procedures are possible: bilateral and multilateral netting.⁷⁴ In bilateral netting, only a limited number of two or three counterparties may agree to offset their positions among each other.⁷⁵ In multilateral netting, CCPs may potentially involve an unlimited number of counterparties and are able to consolidate a much larger number of

69. *Id.*, at 28-29.

70. Raymond Knott, *Alastair Mills, Modeling Risk in General Counterparty Clearing Houses: A Review*, FINANCIAL STABILITY REV., NO. 12, at 162 (Bank of England, 2002); Bank for International Settlements, *Recommendations for Central Counterparties*, 13 (2004), <https://www.bis.org/cpmi/publ/d64.pdf> [<https://perma.cc/332K-WDQ8>].

71. *See, e.g.*, Craig Pirrong, *The Economics of Central Clearing: Theory and Practice*, ISDA DISCUSSION PAPER SERIES, NO. 1, 7 (May 2011), <https://www.isda.org/a/yiEDE/isdadiscussion-ccp-pirrong.pdf> [<https://perma.cc/5S6F-322G>]; *see also* HASENPUSCH, *supra* note 59, at 24.

72. *See, e.g.*, HASENPUSCH, *supra* note 59, at 24.

73. *Id.* at 26-27.

74. *Id.* at 25.

75. *See, e.g.*, Kirsi Ripatti, *Central Counterparty Clearing: Constructing a Framework for Evaluation of Risks and Benefits* 11, BANK OF FINLAND, DISCUSSION PAPER NO. 30/2004 (Dec. 29, 2004), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3022510 [<https://perma.cc/E7W9-WZQA>].

positions.⁷⁶ Both types of netting procedures may allow CCPs to pool all offsetting positions of its counterparties into one single debit or credit obligation.⁷⁷ With a sufficiently high number of matched positions, CCPs are able to reduce counterparty risk and increase overall efficiency in derivative markets.⁷⁸

3. Risk Management and Monitoring

CCPs also provide risk management services by monitoring and adjusting the position risk periodically. The most important risk management tool used by CCPs, which is the first line of defense against the default of any of its members, is margining.⁷⁹ Margin may be defined as a requirement which is calculated by the CCP and held against a clearing member's obligation to perform on changes in value of the positions held.⁸⁰ Margining itself is the process in which the margin requirement is measured, calculated and enforced, but also monitored and adjusted. Collateral, on the other hand, is the instrument posted at the CCP to meet the various margin requirements.⁸¹ The collateral put up by clearing members to cover open positions are typically highly liquid securities or cash.⁸²

There are many different approaches to calculating margin, but typically, CCPs require their members and users to place an initial margin into a CCP account.⁸³ The goal is to cover for market volatility and credit risk of cleared positions.⁸⁴ CCPs evaluate position changes and market values continuously each day.⁸⁵

If the values change, CCPs will place variation margin calls to its members and users to cover for value changes and potential losses.⁸⁶ Variation margin calls, which are defined as a request for additional funds, are made on a daily or intraday basis and are made in cash or any other liquid funds to settle unrealized profits or losses.⁸⁷ Such

76. GREGORY, *supra* note 14, at 134; *see also* NORMAN, *supra* note 58, at 16.

77. HASENPUSCH, *supra* note 59, at 25-26.

78. *Id.*

79. David S. Bates & Roger Craine, *Valuing the Futures Market Clearinghouse's Default Exposure during the 1987 Crash*, 31 JOURNAL OF MONEY, CREDIT AND BANKING 248 (1999).

80. *See, e.g.*, Cox & Steigerwald, *supra* note 11, at 8.

81. *Id.*

82. *Id.*

83. NORMAN, *supra* note 58, at 10-11

84. *Id.*

85. *Id.*

86. GREGORY, *supra* note 14, at 149.

87. European Ass'n of CCP Clearing Houses, *Functional Definitions of a Central Counterparty Clearing House*, POSITION PAPER 5 (2004).

adjustments assure that none of the cleared positions fall below initial margin levels and function as collateral adjustments against position losses.⁸⁸

4. Collateral Management

Collateral management is another risk management option. By definition, collateral management is the process of matching and controlling the counterparties' assets and cash against the exposure of the cleared derivative positions.⁸⁹ As with margining, CCPs evaluate collateral levels on a daily basis.⁹⁰

If a shortfall is detected, the CCP will call for additional collateral posting.⁹¹ Any excess of collateral may be released by the CCP.⁹² Any shortfall, on the other hand, needs to be accounted for through the infusion of additional collateral.⁹³

5. Additional Financial Services

Many of the clearing services that are available to CCPs often require additional financial services. These services often take the form of liquidity provisions, lines of credit, custodianship, settlement services, and cash management.⁹⁴ Other options may also be used.⁹⁵

However, because CCPs are not set up to offer many of these services directly, they must ask other financial institutions to provide these services for them.⁹⁶ The financial institutions CCPs rely on for these services are primarily large systemically important global banks.⁹⁷ Unfortunately, these global banks are also clearing members.⁹⁸

Of even greater concern, these systemically important financial

88. GREGORY, *supra* note 14, at 151-152.

89. HASENPUSCH, *supra* note 59, at 31

90. *Id.*

91. *Id.*

92. *Id.*

93. *Id.*

94. Basel Committee on Banking Supervision (BCBS), Committee on Payments and Market Infrastructure (CPMI), Financial Stability Board (FSB), International Organization of Securities Commissioners (IOSCO), *Analysis of Central Clearing Interdependencies 1* (July 5, 2017) [hereinafter SGCCI Report], <https://www.bis.org/cpmi/publ/d164.pdf> [<https://perma.cc/TGY8-PYDY>].

95. HASENPUSCH, *supra* note 59, at 32 (referring to additional services as "complementary clearing services" Some examples are: provision of a single interface and access to different markets and CCPs, technical and operational support, accounting and regulatory information provision, regulatory reporting services, book-keeping, provision of risk management tools, interest calculation).

96. SGCCI Report, *supra* note 94.

97. *Id.*

98. *Id.*

institutions are the very same entities that were targeted by central clearing mandates.⁹⁹ The main purpose of the central clearing mandate is to replace the often complex and opaque web of derivative contracts between financial institutions with a simpler and more transparent network based on the principle of intermediation.¹⁰⁰ In fact, the lack of transparency of many derivative transactions was one of the factors responsible for the financial crisis.¹⁰¹

As a result, by relying on their own clearing members to provide important financial services necessary for conducting clearing services, CCPs are creating entirely new systemic risks. The creations of these new risks raise the possibility that the central clearing mandate cannot successfully reduce the probability of cascade effects. In fact, because of the uncertain nature of this change, CCPs may significantly increase the chance of future economic downturns.¹⁰²

Because a small core of highly connected CCPs and clearing members dominate these relationships and networks, this risk is even more likely to trigger a future downturn.¹⁰³ The reason is that a shock to one central element of the network may trigger a cascade effect that may reach far beyond its periphery.¹⁰⁴ Another reason is that the shared financial resources, which are equally concentrated among the same core of CCPs, may not serve their intended purpose to isolate risk.¹⁰⁵

99. *Id.*

100. *Id.*

101. See, e.g., *Declaration on Strengthening the Financial System: The London Summit*, G20 (Apr. 2, 2009), <http://www.g20.utoronto.ca/2009/2009ifi.html> [<https://perma.cc/4JQD-4FN9>].

102. Hal S. Scott, *The Reduction of Systemic Risk in the United States Financial System*, 33 HARV. J.L. & PUB. POL'Y 671, 688 (2010).

103. SGCCI Report, *supra* note 94, at 2-3. The concern about interdependencies between CCPs is also mentioned as one of the key priorities in the so-called joint workplan on CCP resilience, recovery and resolvability, and is also noted in the CPMI-IOSCO CCP resilience guidance, the CPMI-IOSCO CCP recovery guidance and the FSB CCP resolution guidance. See, e.g., FIN. STABILITY BD., BASEL COMM. ON BANKING SUPERVISION, COMM. ON PAYMENTS AND MARKET INFRASTRUCTURES, BD. OF THE INT'L ORG. OF SEC. COMM'RS, 2015 CCP WORKPLAN 4 (Apr. 15, 2015), <https://www.bis.org/cpmi/publ/d134b.pdf> [<https://perma.cc/JE3M-A235>]; COMM. ON PAYMENTS AND MARKET INFRASTRUCTURES, BD. OF THE INT'L ORG. OF SEC. COMM'RS, FINAL REPORT - RESILIENCE OF CENTRAL COUNTERPARTIES (CCPs): FURTHER GUIDANCE ON THE PFMI 27 (July 2017), <https://www.bis.org/cpmi/publ/d163.pdf> [<https://perma.cc/RQ6G-N44U>]; COMM. ON PAYMENTS AND MARKET INFRASTRUCTURE, BD. OF THE INT'L ORG. OF SEC. COMM'RS, RECOVERY OF FINANCIAL MARKET INFRASTRUCTURES 10, (July 2017), <https://www.bis.org/cpmi/publ/d162.pdf> [<https://perma.cc/33W6-V8HS>]; FIN. STABILITY BD., GUIDANCE ON CENTRAL COUNTERPARTY RESOLUTION AND RESOLUTION PLANNING 18 (July 5, 2017), <http://www.fsb.org/wp-content/uploads/P050717-1.pdf> [<https://perma.cc/WUM6-B4JF>].

104. SGCCI Report, *supra* note 94, at 3.

105. *Id.* at 2 (finding that out of 26 CCPs investigated across 15 jurisdictions less than 50% or “ten or so of the largest CCPs account for approximately 88 per cent of total financial resources provided to all CCPs.”).

According to a recent study,¹⁰⁶ less than 7% of analyzed clearing members accounted for 75% of total financial resources provided to all CCPs.¹⁰⁷ Yet, it is the access to these financial resources, including initial margin and default funds that are supposedly some of the most essential tools in preventing future public bailouts. The exposure of the largest clearing members to this previously unrecognized risk suggests that the default of leading clearing members may echo through the entire network and trigger defaults across it.¹⁰⁸ Any run on financial resources limited to a core number of CCPs may further enhance this effect.

Finally, it is discouraging that CCPs and their clearing members fail to appropriately monitor margin payments. As recently as March 2017, Deutsche Bank accidentally paid \$35 billion to Eurex Clearing, increasing the collateral held by the CCP by more than half; Eurex Clearing is the fourth largest clearinghouse in the world.¹⁰⁹ The accidental payment received by the CCP was the equivalent of 55% of the collateral held by the clearinghouse on behalf of the entire market.¹¹⁰ While most of the money was returned immediately, 4 billion euros remained with the CCP for days.¹¹¹

III. ISSUE PRESENTED

CCPs are generally considered safe and resilient, but they are not immune to failure.¹¹² During the past 40 years, there were only a few

106. *Id.*

107. *Id.*; see also Louie Woodall, *CCPs' largest members account for half of initial margin*, RISK.NET (Apr. 11, 2018), https://www.risk.net/risk-quantum/5510006/ccps-largest-members-account-for-half-of-initial-margin?utm_medium=email&utm_campaign=RN.Daily.DU.A.M-F0600&utm_source=RN.DCM.Scheduled_Updates&im_amfclid=17106621&im_amfmdf=17ddb322fab05abe4d7b376334022df [<https://perma.cc/G8FC-MUVU>] (referencing an analysis of 10 different global CCPs, including LCH SA and JSCC).

108. This conclusion also draws into question whether the current standard in the U.S. and Europe assessing the financial stability of CCPs is sufficient. This is often also referred to as “cover 2.” For example, under the European market infrastructure regulation (EMIR), CCPs are only required to be able to either withstand the default of the clearing member to which it has the largest exposures or of the second and third largest clearing members, if the sum of their respective exposures are larger. See, e.g., Commission Regulation 648/2012 art. 42, 2012 O.J. (L 201) 1, 37 (EU); see also MURPHY & NAHAI-WILLIAMSON, *supra* note 5, at 7 (arguing that the ‘cover 2’ measure is arbitrary).

109. See, e.g., Will Hadfield, *Deutsche Bank's \$35 Billion Error Boosted Eurex's Coffers by 55%*, BLOOMBERG (Apr. 20, 2018 8:18 AM), <https://www.bloomberg.com/news/articles/2018-04-20/deutsche-bank-s-35-billion-error-boosted-eurex-s-coffers-by-55> [<https://perma.cc/XX4S-VFG9>]; Jonathan Garber, *Deutsche Bank Reportedly Sent \$35 Billion to an Exchange by Accident*, BUS. INSIDER US (Apr. 19, 2018, 1:41 PM), <https://www.businessinsider.sg/deutsche-bank-35-billion-mistake-fixed-in-minutes-2018-4/> [<https://perma.cc/EJ53-PECZ>].

110. Hadfield, *supra* note 109.

111. *Id.*

112. Gary Gensler, *The Derivatives Debate - Clearinghouses Are the Answer*, WALL. ST. J., Apr. 12, 2010, at A21; NORMAN, *supra* note 58, at 40; Michael Mackenzie, *Call for “Bulletproof” Clearing*

instances when clearinghouses have failed or were close to failure.

In 1974, the Caisse de Liquidation des Affaires en Marchandises (CLAM) in Paris was the first clearinghouse to fail.¹¹³ Due to volatility in white sugar markets and heavy speculation, the price of sugar rose to unsustainable levels, followed by market corrections and a crash.¹¹⁴ Speculators and market participants were unable to meet margin calls, which resulted in significant losses for the CCP and its ultimate failure.¹¹⁵ Position losses, the failure to appropriately adjust margin requirements, and the lack of any transparency in the loss allocation process were among the main reasons for the failure.¹¹⁶

The second CCP failure involved the Kuala Lumpur Commodity Clearinghouse.¹¹⁷ The CCP, which was only in operation for three years, failed in 1983.¹¹⁸ After volatilities in palm oil markets, the default of six clearing members triggered the failure.¹¹⁹ In a government report, management inexperience and inaction at the CCP as well as a lack of coordination between the CCP, the exchange, and regulators were later blamed for the failure.¹²⁰ Insufficient rigor, the lack of transparency, and bad decisions by management were also among the causes for this CCP's failure.¹²¹

The third example of a CCP failure, which followed the market crash on Black Monday in 1987, had the most far reaching cascade effect and the highest potential of triggering a global financial crisis. This time, the crash involved equity markets. The collapse of the Hong Kong Futures Exchange Clearing Corporation rapidly swept across the Pacific and directly impacted two of the biggest U.S. CCPs.¹²² The Chicago Mercantile Exchange (CME)¹²³ and the Options Clearing Corporation

Houses, FIN. TIMES, MAR. 22, 2010, <http://www.ft.com/intl/cms/s/0/eacb29cc-7451-11e1-9e4d-00144feab49a.html#axzz3StDxahnb> [<https://perma.cc/67DU-XTB8>]; Fergus Coming & Joseph Noss, *Assessing the Adequacy of CCPs Default Resources*, BANK OF ENG., FIN. STABILITY PAPER 1, 4 (2013).

113. See, e.g., VINCENT BIGNON & GUILLAUME VUILLEMEY, *THE FAILURE OF A CLEARINGHOUSE: EMPIRICAL EVIDENCE* 3 (2017).

114. *Id.* at 13-14.

115. *Id.*; see also NORMAN, *supra* note 58, at 131-32.

116. Bob Hills, David Rule, Sarah Parkinson, & Chris Young, *Central Counterparty Clearing Houses and Financial Stability*, BANK OF ENG. FIN. STABILITY REV. 122, 129-130 (1999); BIGNON & VUILLEMEY, *supra* note 113, at 3-4 (arguing that CLAM was not necessarily lenient in its risk management, but rather engaged in market distortions, which the authors compared to risk-shifting).

117. NORMAN, *supra* note 58, at 133

118. *Id.*

119. See, e.g., NORMAN, *supra* note 58, at 133; GREGORY, *supra* note 14, at 268.

120. NORMAN, *supra* note 58, at 133.

121. *Id.*

122. See, e.g., International Monetary Fund (IMF), *Making Over-the-Counter Derivatives Safer: The Role of Central Counterparties*, Chapter 3 18, GLOBAL FINANCIAL STABILITY REPORT (2010), <https://www.imf.org/external/pubs/ft/gfsr/2010/01/pdf/chap3.pdf> [<https://perma.cc/4ZGN-ZQLB>].

123. The Chicago Mercantile Exchange (CME) did not only dodge failure in 1987, it again had to

(OCC) almost failed at the same time and survived only because of the rapid injection of liquidity by the Federal Reserve and other banks.¹²⁴

The Hong Kong Futures Exchange Clearing Corporation, similar to CALM in Paris and the Kuala Lumpur Commodity Clearing House, lacked clear structural and procedural safety mechanisms.¹²⁵ The CCP did not call for additional funds from its clearing members during the period immediately preceding the crisis and while markets were rising to unprecedented levels.¹²⁶ As a result, the CCP's default fund ran out of money and required a bailout by the government at a cost of nearly HK\$1 billion.

More recently, a clearinghouse failure took place in 2013, long after the global financial crisis. Operations of the National Spot Exchange and its clearinghouse in India were suspended because of widespread fraud, corruption, and incompetent management.¹²⁷ The board of directors of the exchange and the CCP ignored the default of numerous of its clearing members and did not implement any efficient risk management system. In addition, high-risk derivative positions were traded without the posting of any collateral and without any regulatory approval.¹²⁸

Indeed, so far only the 1987 failure of the Hong Kong Futures Exchange Clearing Corporation may have triggered cross-border cascade effects raising the possibility of a global financial crisis. Yet, this was prior to the implementation of the central clearing mandate and the resulting transfer of systemic risk to CCPs. One may even argue that the

deal with numerous failing clearing members in 2005 and was required to conduct forced transfers of Lehman's positions in 2008; Ben S. Bernanke, *Clearing and Settlement During the Crash*, 3 REV. FIN. STUD. 133, 138 (1990); Pirrong, *supra* note 71, at 15 n.20.

124. See, e.g., VIRAL V. ACHARYA ET AL., REGULATING WALL STREET: THE DODD-FRANK ACT AND THE NEW ARCHITECTURE OF GLOBAL FINANCE 401-402 (2011); BERNANKE, *supra* note 90, at 148; see also Ben Bernanke, Chairman, Bd. of Governors of the Fed. Reserve Sys., Clearinghouses, Financial Stability, and Financial Reform at the Financial Markets Conference (Apr. 4, 2011) (transcript available at <https://www.federalreserve.gov/newsevents/speech/bernanke20110404a.htm> [<https://perma.cc/PM3U-KGEY>]).

125. See, e.g., Robert Cox, *Central Counterparties in Crisis: The Hong Kong Futures Exchange in the Crash of 1987*, JOURNAL OF FINANCIAL MARKET INFRASTRUCTURES, VOL. 4 (DEC. 2005)

126. *Id.*

127. Order 4/5/2013-MKT-I/B, 2013, Government of India, Forward Markets Commission 25-29.

128. *Id.* at 27-29; see also Debiprasad Nayak, *National Spot Exchange: What Went Wrong*, WALL STREET JOURNAL: INDIA IN REAL TIME (Apr. 6, 2013), <https://blogs.wsj.com/indiarealtime/2013/08/06/what-went-wrong-at-the-national-spot-exchange/> [<https://perma.cc/YXN6-C659>]; Henny Sender, James Crabtree, *Black Marks Add Up for Blackrock in India*, FIN. TIMES, DEC. 11, 2013, <https://www.ft.com/content/8f9d41e4-6193-11e3-b7f1-00144feabdc0> [<https://perma.cc/8VEU-C58V>] (noting that the National Spot Exchange was suspended from trading after a government investigation found investment irregularities); Ajay Modi, *Future Prospects Look Dim*, BUSINESS TODAY, FEB. 2, 2014, <https://www.businesstoday.in/magazine/corporate/commodity-futures-trading-hit-by-nse-scand-mcx-hurting-most/story/202290.html> [<https://perma.cc/J94Y-XP MJ>] (describing the many scams and fraud schemes that are prevalent in futures markets in India and violate government rules).

2013 failure of the clearinghouse of the National Spot Exchange in India was an outlier.

However, there was a second near failure in 2013 in Asia. The Korean futures trader HanMag Securities collapsed in late 2013, resulting in disproportionate and unjustified losses of numerous clearing members at the Korean clearinghouse KRX.¹²⁹ Following a serious electronic trading error and an algorithm malfunction, HanMag Securities faced bankruptcy.¹³⁰ Without any regard to any of its non-defaulting clearing members, KRX repaid HanMag's counterparties with funds taken directly out of the default fund.¹³¹ A Singapore hedge fund profited with more than \$36 million from the error, while Morgan Stanley, JP Morgan, and Credit Suisse, as members of the KRX clearinghouse, lost millions.¹³²

Even more troubling is the near failure of Nasdaq Clearing AB in September 2018, which occurred during the same week as the tenth anniversary of the Lehman failure.¹³³ The Nasdaq Clearing AB exhausted its own default fund and had to rely on two-thirds of its mutual default fund contributed to by all of its non-defaulting clearing members.¹³⁴ What is particularly concerning about this episode is that Nasdaq's default fund

129. See, e.g., Viren Vaghela, *Korea Clearing Structure in Question After HanMag Trading Error*, RISK.NET (Mar. 5, 2014), <https://www.risk.net/exchanges/2331225/korea-clearing-structure-question-after-hanmag-trading-error> [<https://perma.cc/G73M-23V8>] (“HanMag Securities had to settle payments worth 58.4 billion won including losses and other client margin by 4:00pm on the following day but only paid 1.4 billion won”); Jung-a Song and Jeremy Grant, *South Korea Exchange Rushes to Implement “Kill Switch,”* FIN. TIMES, DEC. 30, 2013, <https://www.ft.com/content/09d1d30c-7135-11e3-8f92-00144feabdc0> [<https://perma.cc/K34C-84GQ>].

130. See, e.g., Song & Grant, *supra* note 129 (“South Korea’s exchange operator, Korea Exchange (KRX), is rushing to implement a “kill switch” system designed to minimise the fallout from trading algorithms going wrong after a local broker was brought to the brink of bankruptcy by erroneous electronic trades this month”).

131. See, e.g., Jeremy Grant, Jung-a Song, & Phillip Stafford, *Banks Launch Clearing Review After Korean Broker Default*, FIN. TIMES, MARCH 7, 2014, <https://www.ft.com/content/14b59838-a4d6-11e3-9313-00144feab7de> [<https://perma.cc/NS2U-B6E3>] (arguing that this case of KRX “highlights how clearinghouses have moved center stage as regulators and market participants reform the financial system.”); Manmohan Singh & Dermot Turing, *Central Counterparties Resolution – An Unresolved Problem* 10 (Int’l Monetary Fund Working Papers WP/18/65, Mar. 2018) (noting that “the capital of KRX was at risk only after the non-defaulting members’ default fund contributions [would have been exhausted].”); see also Mark P. Wetjen, Comm’r, Commodity Future Trading Comm’n, *Remarks Before the FIA Asia Derivative Conference* (Dec. 4, 2014), <https://www.cftc.gov/PressRoom/SpeechesTestimony/opawetjen-11> [<https://perma.cc/QU63-K9BD>] (recalling the KRX bail-out as “a recent market event” and noting that “[t]he clearinghouse used a portion of its guaranty fund to cover the defaulter’s losses, which resulted in clearing members losing some portion of their default fund contributions; the clearinghouse itself did not suffer a loss because its skin in the game came after the non-defaulting members’ contributions.”).

132. See, e.g., Vaghela, *supra* note 129 (noting that JP Morgan alone has paid more than 1.5 billion won and the Singapore hedge fund Cassia Capital “was enriched to the tune of \$36 million”).

133. See also *infra* Part IV.

134. *Infra* Part IV.

was supposed to withstand the default of its two largest members.¹³⁵ Yet, the default was triggered by one individual trader, and that trader's defaulted portfolio only represented five percent of the total initial margin pool for Nasdaq's commodity clearing services.¹³⁶

All of these described failures or near-failures were the result of improper risk management practices, combined with the insolvency of one or more clearing members.¹³⁷ At its most basic level, the lessons to be learned from these failures are that loss allocation and risk sharing procedures of CCPs need to be transparent and liquidity shortfalls need to be avoided. The latter may require a long-term historical perspective to set proper margins and market liquidity to support default management.¹³⁸ Further, operational risk may also be prevented through more consistent risk monitoring and coordinated market oversight, which at a global level may necessitate broader standard harmonization.¹³⁹

IV. NORMATIVE ANALYSIS

Central Counterparties (CCPs) may be a useful way of managing risk in global financial markets.¹⁴⁰ CCPs manage risk for counterparties by taking on risk that would otherwise be borne by the real parties to complex financial transactions.¹⁴¹ This risk management function has been essential to the management of the global financial markets for more than a century and is not a new development.¹⁴² CCPs have proven very

135. See, e.g., Regulation (EU) No. 648/2012 of the European Parliament and of the Council, 2012 O.J. (L 201) 1, ART. 42.

136. See, e.g., Louie Woodall, *The Tale of Two CCPs: Nasdaq and ICE Breaches Carry Warnings for the Market*, RISK.NET (Jan. 15, 2019), <https://www.risk.net/our-take/6288441/a-tale-of-two-ccps> [<https://perma.cc/VH5Y-L5VP>] (describing the Nasdaq Clearing AB default and comparing it to a clearing member default at ICE which involved a much larger margin breach of \$1.2 billion at its peak); see also Alessandro Aimone, *Nasdaq Default Came at Time of Mass Margin Breaches*, RISK.NET (Jan. 4, 2019), <https://www.risk.net/risk-quantum/6002426/nasdaq-default-came-at-time-of-mass-margin-breaches> [<https://perma.cc/H7WF-CK5A>] (reporting that CCP's clearing members incurred 49 margin breaches at the end of September 2018).

137. See, e.g., Thomas Krantz, *CCP Critical Risk Update by CPMI IOSCO*, THOMAS MURRAY, OPINIONS (JULY 16, 2018), <https://thomasmurray.com/opinion/ccp-critical-risks-update-cpmi-iosco> [<https://perma.cc/8A8T-PJB4>] (noting that "some CCPs have not implemented practices that are fully consistent with specific [PFMI] standards.").

138. See, e.g., Pedro Gurrola-Perez, *The validation of Filtered Historical Value-at-Risk Models*, 12 J. RISK MODEL VALIDATION, 85, 85-110 (2018) (discussing VAR models based on historical simulation).

139. See, e.g., Chris Davis, *Brace for More Nasdaq-Like Losses, HKEx CRO Warns*, RISK.NET (Nov. 29, 2018), <https://www.risk.net/derivatives/6168081/brace-for-more-nasdaq-like-losses-hkex-cro-warns> [<https://perma.cc/VWL5-LVF4>] (Roland Chai says defaults more likely as global instability increases; CCPs should focus on auction processes and monitoring of risk exposure).

140. See, e.g., RICHARD HECKINGER, ROBERT STEIGERWALD, IVANA RUFFINI, & KRISTIN WELLS, UNDERSTANDING DERIVATIVES: MARKET AND INFRASTRUCTURE 12-13 (2013).

141. *Id.*

142. See, e.g., Jonathan Ira Levy, *Contemplating Delivery: Futures Trading and the Problem of*

effective for managing financial risk of certain exchange traded financial products,¹⁴³ which include options, futures, swaps, or forward rate agreements.¹⁴⁴ As noted above, derivatives are financial instruments referencing underlying assets or other variables, such as commodities, currency, money, or equities from which the financial instrument's price or value is derived.¹⁴⁵ In their most basic form, these instruments allocate the risk of price fluctuations of these assets between counterparties.¹⁴⁶

In response to the Great Recession and the particular role derivatives played during the 2008 crisis,¹⁴⁷ CCPs have gained new relevance and importance.¹⁴⁸ This is particularly true in light of the global implementation of a mandatory clearing requirement for OTC derivatives.¹⁴⁹

CCPs are viewed as a reliable tool for reducing cascade effects and helping to avoid future bailouts of large financial institutions.¹⁵⁰ Cascade effects may be described as the act of one systemically important financial institution contributing to or triggering the failure of one or more additional financial institutions.¹⁵¹ Of course, external factors may also play a significant role in economic downturns that result in the failure of systemically important financial institutions and all their interconnected entities.¹⁵²

The Lehman Brothers' failure and the bailout of the American International Group (AIG) by the U.S. government are illustrative examples of bad policy, a deep misunderstanding of derivative markets, and the ways in which cascade effects may negatively impact the global economy.¹⁵³

Commodity Exchange in the United States, 1875-1905, 111 AMER. HIST. REV. 307, 317 (2006); NORMAN, *supra* note 58, at 57-66; *see also* PETER NORMAN, PLUMBERS AND VISIONARIES: SECURITIES SETTLEMENT AND EUROPE'S FINANCIAL MARKET 18-27 (2007) (hereinafter "PLUMBERS AND VISIONARIES"); GREGORY, *supra* note 14, at 6.

143. Domanski, D, L Gambacorta and C Picillo, *Central clearing: trends and current issues*, 59-76, BANK FOR INTERNATIONAL SETTLEMENTS, QUARTERLY REVIEW, (DEC. 2015), https://www.bis.org/publ/qtrpdf/r_qt1512g.pdf [<https://perma.cc/L8TK-F5YQ>].

144. *See, e.g.*, PARKER, *supra* note 41, at 8.

145. *See supra* Part II.A.; *see also* DURBIN, *supra* note 20, at 10-11.

146. *See, e.g.*, Sean J. Griffith, *Governing Systemic Risk: Towards A Governance Structure for Derivatives Clearinghouses*, 61 EMORY L.J 1153, 1166-68 (2012).

147. *See, e.g.*, Roe, *supra* note 7, at 1651.

148. *See, e.g.*, Charlie McCreedy, *European Commissioner for Internal Markets and Services, Derivatives and Risk Allocation*, DERIVATIVES CONFERENCE SPEAKER'S DINNER (SEPT. 24, 2009), at http://europa.eu/rapid/press-release_SPEECH-09-426_en.htm.

149. SGCCI Report, *supra* note 94, at 1.

150. *See, e.g.*, Scott, *supra* note 102, at 686-691; GREGORY, *supra* note 14, at 44.

151. *See, e.g.*, Scott, *supra* note 102, at 673

152. *Id.*

153. *See, e.g.*, James B. Stewart & Peter Eavis, *Revisiting the Lehman's Brothers Bailout That Never Was*, N.Y. TIMES (Sept. 29, 2014), <https://www.nytimes.com/2014/09/30/business/revisiting-the->

For example, Joseph J. Cassano, the Head of AIG's Financial Products Division, proved so oblivious to the risk of the AIG derivative portfolio that, in fall of 2007, he famously noted that "it is hard for us, without being flippant, to even see a scenario within any kind of realm of reason that would see us losing one dollar in any of those transactions."¹⁵⁴ Less than a year later AIG was bailed out¹⁵⁵ at a cost of more than \$180 billion to U.S. taxpayers.¹⁵⁶

Indeed, it was the overreliance on OTC derivative contracts, paired with a lack of transparency and inadequate risk management of these financial instruments, which played a major role in triggering the Great Recession.¹⁵⁷ The lack of transparency of OTC derivative markets stems from the fact that these financial instruments were typically only negotiated and traded at a bilateral level between actual counterparties. This is to say that the characteristics of the underlying assets in the market

lehman-brothers-bailout-that-never-was.html [https://perma.cc/VJ6H-THCG]; James C. DuPont, *Comment, A Second Chance at Legal Certainty: AIG Collapse Provides Impetus to Regulate Credit Default Swaps*, 61 ADMIN. L. REV. 843, 846-48 (2009); Press Release, Federal Reserve Board, Federal Reserve Board, with full support of the Treasury Department, authorizes the Federal Reserve Bank of New York to lend up to \$85 billion to the American International Group (AIG) (Sept. 16, 2008), <https://www.federalreserve.gov/newsevents/pressreleases/other20080916a.htm> [https://perma.cc/9LKL-F2XF]; Stephen J. Lubben, *Lehman's Derivative Portfolio*, 1-2, SETON HALL PUBLIC LAW RESEARCH PAPER (Dec. 2, 2015), <https://ssrn.com/abstract=2698234> [https://perma.cc/B2AX-MPQB]; Steven L. Schwarcz, *Derivatives and Collateral Balancing Remedies and Systemic Risk*, 2015 U. ILL. L. REV. 699, 715-717.

154. Gretchen Morgenson, *Behind Insurer's Crisis, Blind Eye to a Web of Risk*, N.Y. TIMES (Sept. 28, 2008), https://www.nytimes.com/2008/09/28/business/28melt.html?pagewanted=all&_r=0 [https://perma.cc/T3NL-EDXB].

155. See, e.g., Alistair Gray, *Greenberg Loses Battle Over Damages Related to AIG Bailout*, FIN. TIMES (May 9, 2017), <https://www.ft.com/content/28724c6e-34ce-11e7-bce4-9023f8c0fd2e?mhq5j=e3> [https://perma.cc/2YEL-9843]; Aaron M. Kessler, *EX-AIG Chairman Wins Bailout Suit, but Gets No Damages*, N.Y. TIMES (June 15, 2015), <https://www.nytimes.com/2015/06/16/business/dealbook/judge-sides-with-ex-aig-chief-greenberg-against-us-but-awards-no-money.html> [https://perma.cc/G26B-3AUD]; Andrew Harris & Susan Decker, *Greenberg's Starr Returns to Court Seeking Damages over AIG Bailout*, INSURANCE JOURNAL (Nov. 7, 2016), <http://www.insurancejournal.com/news/national/2016/11/07/431674.htm> [https://perma.cc/8SFV-8JP8]; Jonathan Stempel, *Ex-AIG Chairman Greenberg loses appeal over 2008 bailout*, REUTERS BUSINESS NEWS, <http://www.reuters.com/article/us-aig-bailout-idUSKBN1851OU> [https://perma.cc/PWA6-AZRH] (containing a detailed timeline of the legal suit pursued by Greenberg); Daniel Gross, *Remember the \$182 Billion AIG Bailout? It Just Wasn't Generous Enough*, THE DAILY BEAST (Oct. 15, 2014), <http://www.thedailybeast.com/remember-the-dollar182-billion-aig-bailout-it-just-wasnt-generous-enough> [https://perma.cc/M7NG-Z4RS].

156. See, e.g., Andrew R. Sorkin, *Breaking Even on AIG*, N.Y. TIMES (Oct. 4, 2010), <http://www.nytimes.com/2010/10/05/business/05sorkin.html> [https://perma.cc/6473-3SDT].

157. For a more nuanced perspective, see Richard Squire, *Shareholder Opportunism in a World of Risky Debt*, 123 HARV. L. REV. 1151, 1186-87 (2010) (arguing that it was not the derivative portfolio alone that was to blame for AIG's problems, but rather the fact that AIG traders, on the one hand, sold contingent debt linked to subprime mortgages and the AIG parent company, on the other hand, simultaneously purchased the very same financial instruments for the company's general investment portfolio).

were unknown and led to adverse selection problems.¹⁵⁸ The bilateral level trading prevented financial markets, investors, and regulators from appropriately evaluating the risk that was associated with many different types of derivatives.

In 2009, the G20 leaders formally recognized this market failure and agreed on wide ranging derivative market reforms.¹⁵⁹ One of the hallmarks of these derivative reforms was the requirement that standardized OTC derivative contracts should be cleared through CCPs.¹⁶⁰

The requirement of mandatory clearing combined with additional reporting duties for all standardized OTC derivatives aims to limit cascade effects and to guarantee better regulatory oversight.¹⁶¹ The idea is to monitor the risk exposure of all clearing members or their clients and to share losses in the event of a default.¹⁶² Most jurisdictions, including the U.S. and the European Union,¹⁶³ have undertaken similar reforms.¹⁶⁴

Yet, more than a decade after the Great Recession, these reforms may not have had the desired effect. Instead, this mandate may have significantly increased the very category of risk it was meant to address, thus making the potential need for public bailouts of CCPs, since they are systemically important financial institutions,¹⁶⁵ all but a certainty in the

158. *See, e.g.*, EMIR Art. 2(7); *see also* European Commission Press Release IP/10/1125, Making Derivatives Markets in Europe Safer and More Transparent, (Sep. 15, 2010), <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/1125&format=HTML&aged=0&language=EN&guiLanguage=en> [<https://perma.cc/5SKR-XTW7>]; European Commission Press Release MEMO/12/232, Regulation on Over-the-Counter Derivatives and Market Infrastructures—Frequently Asked Questions, (Mar. 29, 2012), <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/12/232> [<https://perma.cc/U7WD-85P8>].

159. It is noteworthy that regulators in the U.S. and Europe had already called for central clearing of derivative contracts immediately after the rescue of Bear Stearns. *See, e.g.*, Press Release, Statement Regarding June 9 Meeting on Over-the-Counter Derivatives, FEDERAL RESERVE BANK OF NEW YORK (June 9, 2008), <https://www.newyorkfed.org/newsevents/news/markets/2008/ma080609> [<https://perma.cc/88SR-4Q8H>].

160. *Id.*

161. *See, e.g.*, Declaration on Strengthening the Financial System: The London Summit, G20 (Apr. 2, 2009), <http://www.g20.utoronto.ca/2009/2009ifi.html> [<https://perma.cc/4JQD-4FN9>]; Pittsburgh Summit (the G20 heads of state and government committed to promote the standardization of all credit derivative markets, requiring that all standardized OTC derivative contracts be cleared through central counterparties and be reported to trade repositories.”).

162. Scott, *supra* note 102, at 693.

163. MICHAEL SCHILLIG, RESOLUTION AND INSOLVENCY OF BANKS AND FINANCIAL INSTITUTIONS, ¶¶2.20-2.22, at 27-28 (addressing FMI reforms in the European Union), and ¶¶2.40-2.41, at 35-36 (addressing FMI reforms in the United States)(Oxford University Press, 2016).

164. *Id.*, ¶¶2.23-2.27, at 28-30 (discussing various other national reform initiatives).

165. In the European Union Central Counterparties are per se considered systemically important or may be designated by the European Commission and the European Securities and Markets Authority (ESMA) as systemically important, whereas in the United States CCPs need to be explicitly designated by the Financial Stability Oversight Council (FSOC) as systemically. *See, e.g.*, U.S. DEP’T OF THE

near future.

Securitization in globally leveraged loan markets is of particular concern. Low lending standards and mounting debt in these markets have significantly increased the default risk of many overleveraged companies.¹⁶⁶ In favor of cheap financing, investor protections are being eliminated and questionable collateral is used to underwrite loans¹⁶⁷. The rapid growth in leveraged loan markets has been driven by creditors' seemingly unlimited risk appetite and increased securitization activities through collateralized loan obligations (CLOs). CLOs are securities that consist of a pool or various tranches of loans that may be organized by maturity and risk.¹⁶⁸ To sell these tranches to investors, CLOs may be issued as collateral debt obligations (CDOs) by a business entity or trust created for this purpose.¹⁶⁹ Rather than being backed by mortgage securities, which triggered the financial crisis in 2007, these CDOs are backed by subprime corporate debt.¹⁷⁰

TREAS., DESIGNATION OF SYSTEMICALLY IMPORTANT FINANCIAL MARKET UTILITIES (2012), <https://www.treasury.gov/initiatives/fsoc/Documents/2012%20Appendix%20A%20Designation%20of%20Systemically%20Important%20Market%20Utilities.pdf> [<https://perma.cc/XTA7-Y4HJ>].

166. See, e.g., Sam Fleming, *Janet Yellen sounds alarm over plunging loan standards*, FIN. TIMES (Oct. 24, 2018), <https://www.ft.com/content/04352e76-d792-11e8-a854-33d6f82e62f8> [<https://perma.cc/Y6M7-NYQN>]; see also Colby Smith & Robin Wigglesworth, *Boom in emerging market corporate debt stirs fears*, FIN. TIMES (Jan 19, 2020), <https://www.ft.com/content/3008bbf6-3878-11ea-a6d3-9a26f8c3cba4> (noting that the global corporate debt market is an accident waiting to happen, which, among other reasons, is fuelled by the increased wave of corporate bond buying by mutual funds and ETFs that allow investors to pull out money more quickly than before).

167. See, e.g., Joy Wiltermuth and Kirsten Haunss, *Yellen warns of corporate distress, economic fallout*, REUTERS.COM (Feb. 27, 2019), <https://www.reuters.com/article/us-yellen-distressed/yellen-warns-of-corporate-distress-economic-fallout-idUSKCN1QG2CZ> [<https://perma.cc/22KT-TNH3>] (Janet Yellen is cited as noting that she is "concern[ed] about the deterioration in lending standards that we have seen [in leveraged loan markets]" and that "[a] large share of [these loans are] covenant-lite and some of the explicit ways in which covenants have weakened are a concern.").

168. See, e.g., *Collateralized Loan Obligation (CLO), Definition*, INVESTOPEDIA, <https://www.investopedia.com/video/play/collateralized-loan-obligation-clo/> [<https://web.archive.org/web/20190520132821/https://www.investopedia.com/video/play/collateralized-loan-obligation-clo/>].

169. See, e.g., *Asset Backed Security - ABS vs. Collateralized Debt Obligation - CDO*, INVESTOPEDIA, <https://www.investopedia.com/ask/answers/040715/what-difference-between-collateralized-debt-obligation-cdo-and-asset-backed-security-abs.asp> [<https://perma.cc/4LKB-QP6J>]; see also Mayra Rodriguez Valladares, *CLO Issuance Is Far Surpassing Other Types of Asset Backed Securities*, FORBES (Nov. 5, 2018), <https://www.forbes.com/sites/mayrarodriguezvalladares/2018/11/05/clo-issuance-is-far-surpassing-other-types-of-asset-backed-securities/#7e452d1b1384> [<https://perma.cc/U2RP-XFVK>] (Noting that "[i]n an economic downturn, whatever type of investor ends up holding the leveraged loans, the collateralized loan obligations which include leveraged loans, or the sellers of credit default protection referencing CLOs, will have fewer credit protections than what they need to sustain losses."); Matt Wirz and Cezary Pedkul, *Hedge Funds Revive the Junk Bond CDO*, PRIVATE EQUITY NEWS (Nov. 8, 2018), <https://www.penews.com/articles/hedge-funds-revive-the-junk-bond-cdo-20181108> [<https://perma.cc/R65N-SK6E>] ("Issuance of corporate debt CDOs has tripled [in 2018] to at least \$3.8 billion").

170. It is important to note here that not every CLO or CDO may also qualify as a derivative

Since the Great Recession, the leveraged loan market has more than doubled in size, reaching approximately \$1.3 trillion by the end of 2018.¹⁷¹ Though some estimates assume a size of more than \$2.2 trillion.¹⁷² It is unclear how many of these loans are subprime.¹⁷³ This uncertainty has important implications in practice because any financial institution that has excessive exposure to these types of CLOs may be “runnable”¹⁷⁴ and the lack of transparency may make it difficult to determine what amount of capital and liquidity buffers would be required for financial institutions to avoid any failures or bailouts in the future.¹⁷⁵

Janet Yellen, the former chairman of the Board of Governors of the Federal Reserve System,¹⁷⁶ and Senator Elisabeth Warren¹⁷⁷ are among many experts warning about the systemic risk associated with these loan obligations¹⁷⁸ and are predicting that many companies will go bankrupt or

product, but because of the high risk in leveraged or cove-lite loan markets, it is more than likely that creditors may not only buy credit protection through credit default swaps or swaptions, but it is also likely that most CLOs are packaged as synthetic collateralized debt obligation, which are a form of credit derivatives.

171. . See, e.g., *How Large is the Leverage Loan Market?*, BANK OF ENGLAND (Jan. 25, 2019), <https://www.bankofengland.co.uk/bank-overground/2019/how-large-is-the-leveraged-loan-market> [https://perma.cc/DM78-6QNK]; see also Sirio Aramonte and Fernando Avalos, *Structured finance then and now: a comparison of CDO and CLOs*, BANK OF INT’L SETTLEMENTS QUARTERLY REVIEW (Sept. 2019), at 11-14, Box B, Graph B, https://www.bis.org/publ/qtrpdf/r_qt1909.pdf [https://perma.cc/6LAU-92AK]; *Leveraged Loan Primer*, S&P GLOBAL, <http://www.leveragedloan.com/primer/#!definingleveraged> [https://perma.cc/WXE6-JQ74] (noting that “the S&P/LSTA Loan Index, widely used as a proxy for market size, topped the \$1 trillion mark in April 2018, after growing every year since dipping to \$497 billion in 2010”); Tirupam Goel, *The rise of leveraged loans: a risky resurgence?*, BANK OF INT’L SETTLEMENTS QUARTERLY REVIEW (Sept. 2018), at 10, Box A, https://www.bis.org/publ/qtrpdf/r_qt1809.pdf [https://perma.cc/4Y93-Y7RN].

172. *How Large is the Leverage Loan Market?*, BANK OF ENGLAND (Jan. 25, 2019), <https://www.bankofengland.co.uk/bank-overground/2019/how-large-is-the-leveraged-loan-market> [https://perma.cc/DM78-6QNK].

173. *Id.*

174. See, e.g., Fleming, *Global regulators launch inquiry into leveraged loans*, FIN. TIMES (Mar. 6, 2019), <https://www.ft.com/content/2cb614ee-4067-11e9-b896-fe36ec32aece> [https://perma.cc/P9EH-T6LE] (runnable refers to institutions such as banks that could experience a run on deposits).

175. *Id.*

176. See, e.g., Fleming, *supra* note 166.

177. See, e.g., Kristen Haunss, *Senator Warren presses lenders on leveraged lending*, REUTERS (Nov. 15, 2018), <https://uk.reuters.com/article/reg-levlending/senator-warren-presses-regulators-on-leveraged-lending-idUKL2N1XP24B> [https://perma.cc/P2BJ-VWGU] (citing Senator Warren as noting that she is “concerned that the large leverage lending market exhibits many of the characteristics of the pre-2008 subprime mortgage market.”); see also Letter from Elizabeth Warren, U.S. Sen. from Mass., to Steven T. Mnuchin, Secretary of the Treasury, Joseph Otting, U.S. Comptroller, Jelena McWilliams, Chairman Federal Deposit Insurance Corporation, Jerome Powell, Chairman Board of Governors Federal Reserve System, Jay Clayton, Chairman Securities and Exchange Commission (Nov. 14, 2018), <https://www.warren.senate.gov/imo/media/doc/2018.11.14%20Letter%20to%20Regulators%20on%20Leveraged%20Lending.pdf> [https://perma.cc/J5W7-3WDR] (arguing that “Securitizations like CLOs are central to the leverage market.”).

178. See, e.g., Matt Phillips, *Wall Street Loves These Risky Loans. The Rest Of Us Should Be Wary*, N.Y. Times (Oct. 19, 2018), <https://www.nytimes.com/2018/10/19/business/economy/clo-corporate>

default because they are significantly overleveraged.¹⁷⁹ One example of a case in point is Anastasia Beverly Hills, which used general intangible assets to secure a \$650 million loan.¹⁸⁰ One of the assets offered as collateral for this loan was the beauty company's Instagram page with more than 18.7 million followers.¹⁸¹

The only difference between credit derivatives issued in leveraged loan markets in 2018 and credit derivatives issued in subprime mortgage markets in 2008 is their reference entities, which are lowly rated corporate debt rather than subprime mortgages.¹⁸² Due to the erosion of prudent lending standards in leveraged loan markets, the risk exposure of CLOs may be equal to or even worse than those of mortgage backed securities before the Great Recession.¹⁸³ What may be even more concerning is the

loans.html [https://perma.cc/J6G6-JWXM] (citing Professor Daniel K. Tarullo, former governor at the Federal Reserve, that if there is a problem with leveraged loans that "this is where the unfinished business of the post-financial crisis reform efforts is going to be revealed."); see also Mayra Rodriguez Valladares, *Leveraged Loan Market Warnings Have Been Ignored For Over Five Years*, FORBES (Oct. 26, 2018), <https://www.forbes.com/sites/mayrarodriguezvalladares/2018/10/26/leveragedloanmarketwarningshavebeenignoredforoverfiveyears/#10793e0b3df3> [https://perma.cc/Q6VC-ZNYN] (noting that concerns have been consistently raised since 2013 and expressed in at least one guidance document by the Federal Reserve, the OCC and the FDIC); *How Large is the Leverage Loan Market?*, BANK OF ENGLAND (Jan. 25, 2019), <https://www.bankofengland.co.uk/bank-overground/2019/how-large-is-the-leveraged-loan-market> [https://perma.cc/DM78-6QNK] (The BoE estimates that at least 45% of an estimated \$2.2tn of leveraged loans outstanding worldwide are held through CLOs and making the stock of leveraged loans in 2018 very similar to the stock in subprime mortgages before the onset of the financial crisis, if measured relative to the size of the relevant credit market.).

179. See, e.g., *Wider Risk of Leveraged Loans Warrants Scrutiny, Tarullo Says*, BLOOMBERG LAW (Oct. 30, 2018), https://www.bloomberglaw.com/document/X43T97DS000000?bna_news_filter=banking-law&jcsearch=BNA%252000000166c529d347ad77c7fd2e650000#jcite [https://perma.cc/77A9-T5FV] (Professor Daniel K. Tarullo, former Governor of the Federal Reserve System, is cited as suggesting that "[t]here is nobody charged with looking at whether [the securitization of leveraged loans] is creating a risk of cascading consequences.").

180. See, e.g., Joe Rennison & Colby Smith, *Debt machine: are risks piling up in leveraged loans?*, FIN. TIMES (Jan. 20, 2019), <https://www.ft.com/content/64c9665e-1814-11e9-9e64-d150b3105d21> [https://perma.cc/MLE2-JXVG].

181. *Id.* ("With 18.7m followers and a roster of fans that includes the Kardashians and Naomi Campbell, the Instagram page of beauty company Anastasia Beverly Hills offers crafty demonstrations of how to use its products to get the perfect eyebrows and lips.").

182. See, e.g., *Key Features of CDOs now and CLOs Then*, BANK OF INT'L SETTLEMENTS QUARTERLY REVIEW (Sept. 2019), at 13, Table B, https://www.bis.org/publ/qtrpdf/r_qt1909.pdf [https://perma.cc/LG6N-5W7E]; see also *supra* note 170 and accompanying text.

183. The author is aware of the fact that CLOs have fared relatively well during the Great Recession, but he disagrees with those who simply argue that "CLOs begin with a 'C' and end with an 'O,'" and which should end the comparison with mortgage backed securities. See, e.g., Joe Rennison, *CLOs: the specialist loan vehicle luring yield-hungry investors*, FIN. TIMES (Jan. 27, 2019), <https://www.ft.com/content/db97c650-1ec6-11e9-b126-46fc3ad87c65> [https://perma.cc/2FA8-CVPY] (citing an investor as noting that "[CLOs] begin with a 'C'; and end with an 'O,' says one investor, adding that parallels should end there. 'Overall, the asset class has proved resilient across several market cycles.'"). The reasons for the author's disagreement are multifold. First, in the wake of low interest rates and reduced lending standards in cove-lite loans, risk exposures have shifted compared to pre-2008 loan markets. See, e.g., Valladares, *supra* note 169. In addition, market volumes have also more than

fact that leveraged loan markets, similar to the subprime mortgage crisis, also lack sufficient transparency which makes it virtually impossible to properly calculate any true risk distribution in these markets.

Today, the exact size of the leveraged loan markets cannot be estimated accurately.¹⁸⁴ At least 25% of the leveraged loan markets in 2018 and 2019 may be unallocated.¹⁸⁵ This makes it difficult to accurately calculate risk and identify the exact end-investors. One implication is that the risk of loss is difficult to measure.

The rapid growth of leveraged loan markets may, however, only be one of many new concerns that could trigger significant cascading consequences for CCPs.¹⁸⁶ Additional, and maybe even broader, concerns are widespread global differences in risk management and loss sharing rules that CCPs rely on.¹⁸⁷

These concerns have yet to be concretely addressed by scholars and practitioners. That may be why Nasdaq Clearing AB blew through almost all of its safeguards put in place after the Great Recession.¹⁸⁸ This CCP not only exhausted its own default fund, but also needed to use more than

doubled. *Id.* Second, while it may be correct that the volatility and corrections in leveraged loan markets in December of 2018 may have proven some resilience of CLOs, this assumption may be based only on the fact that AAA notes enjoy a higher level of protection than those in lower rated tranches. *See, e.g., The FPC's assessment of the risks from leverage in the non-bank financial system, Bank of England, Financial Stability Report, Issue No. 44, at 51 (Nov. 2018),* <https://www.bankofengland.co.uk/-/media/boe/files/financial-stability-report/2018/november-2018.pdf?la=en&hash=7239DE596DD5DB14BEB17E1141C2CDEB73A8623C#page=51> [<https://perma.cc/5B6L-9BNE>]. Finally, CLOs, in similarity to mortgage backed securities, may be defined as CDOs—it is obvious that both abbreviations start and end with the same letters of the alphabet. *See, e.g., Carol M. Kopp, Asset-Backed Security – ABS vs. Collateralized Debt Obligation – CDO, INVESTOPEDIA (APRIL 20, 2019),* <https://www.investopedia.com/ask/answers/040715/what-difference-between-collateralized-debt-obligation-cdo-and-asset-backed-security-abs.asp> [<https://perma.cc/TH3G-58YL>].

184. *See, e.g., Bank of England, Financial Stability Report, Issue No. 44, at 42 (Nov. 2018),* <https://www.bankofengland.co.uk/-/media/boe/files/financial-stability-report/2018/november-2018.pdf?la=en&hash=7239DE596DD5DB14BEB17E1141C2CDEB73A8623C#page=51> (noting that “[t]he outstanding stock of leveraged loans that would typically be distributed by banks to non-bank institutional investors is estimated to be around US\$1.8 trillion. This figure rises to US\$2.2 trillion once loans that would typically be held by banks themselves are included. And it would rise further if revolving credit facilities provided by banks were also included.”).

185. *Id.* at 45.

186. *See, e.g., Fleming, supra* note 166 (quoting Mr. Randal Quarles, the Financial Stability Board’s chairman, as noting that “[o]ther areas under scrutiny are potential vulnerabilities in the fintech area and among central counterparties.”).

187. *See also supra*, Part III.

188. *See, e.g., Philip Stafford & David Sheppard, Trader blows €100m hole in Nasdaq’s Nordic power market, FIN. TIMES (Sep. 13, 2018),* <https://www.ft.com/content/43c74e02-b749-11e8-bbc3-ccd7de085ffe> [<https://perma.cc/R658-YUGA>]; *see also Sarah Bell & Henry Holden, Two defaults at CCPs, 10 years apart, BANK OF INTERNATIONAL SETTLEMENTS, BIS QUARTERLY REVIEW, INTERNATIONAL BANKING AND FINANCIAL MARKETS DEVELOPMENTS, BOX A, at 75, (DEC. 2018),* https://www.bis.org/publ/qtrpdf/r_qt1812.pdf [<https://perma.cc/5XHT-247W>] (including a step by step description of the events at Nasdaq Clearing).

two-thirds of its mutual default fund, which included contribution from all of its non-defaulting clearing members.¹⁸⁹

The near failure of the Swedish CCP, which was used by more than 160 traders across Europe, is now subject to numerous regulatory investigations.¹⁹⁰ The single most important reason for this failure may be the fact that Nasdaq granted the Norwegian derivative trader Einar Aas the privilege to directly clear and guarantee his own trades as an individual at the clearinghouse.¹⁹¹ As is common practice at many other CCPs,¹⁹² Nasdaq clearing did not require this trader to go through any institutional clearing member as a safeguard.¹⁹³ A reason for this privilege may be that Einar Aas was considered a derivatives trading *Wunderkind* in Europe's largest power markets.¹⁹⁴ He posted at least \$420 million in taxable income since 2002 and was viewed as being one of the very best traders in the European power markets.¹⁹⁵ In 2016, Einar Aas earned nearly \$100 million in income alone and paid almost \$27 million in taxes, making him the single largest individual taxpayer in Norway.¹⁹⁶

Yet, a wrong-way bet on the spread between German and Nordic power contracts rapidly ended Einar Aas' career in September 2018.¹⁹⁷ Einar

189. Bell & Holden, *supra* note 188.

190. See, e.g., Joanne Faulkner, *Nasdaq Trader's €114M Loss Prompts Swedish Investigation*, LAW360 (Sept. 17, 2018), <https://www.law360.com/articles/1083292/nasdaq-trader-s-114m-loss-prompts-swedish-investigation> [<https://perma.cc/KKR9-8H5C>]; see also Samuel Agini, *Regulator criticizes Nasdaq over power trader's €114M default*, FINANCIAL NEWS (Jan. 10, 2019), <https://www.fn.london.com/articles/regulator-criticises-nasdaq-over-power-traders-e114m-default-20190110> [<https://perma.cc/ME78-FVA8>] (“The Norwegian regulator said in its report that Nasdaq had failed to periodically review the fitness of its member – of which Aas was one – to trade in the exchange.”); *Nasdaq ASA – summary of the final report*, *Finanstilsynet*, The Financial Supervisory Authority of Norway, (Jan. 7, 2019), https://www.finanstilsynet.no/contentassets/bdfdbb366f8648248a75f38545ddfbad/nasdaq-oslo-asa--summary-of-the-final-report-dated-7-january-2019.pdf?mod=article_inline [<https://perma.cc/9PCK-Y4UV>] (noting that Nasdaq's investigation has been inadequate); Luke Clancy, *BIS slams Nasdaq Clearing for risk management failure*, RISK.NET (Dec. 21, 2018), <https://www.risk.net/risk-management/operational-risk/6232391/bis-slams-nasdaq-clearing-for-risk-management-failures> [<https://perma.cc/NY5Q-3HJV>] (noting that the Bank of International Settlements “issued a stern rebuke to Nasdaq.”); Bell & Holden, *supra* note 188 (comparing the Nasdaq failure directly to the Lehman's failure).

191. See, e.g., Dan DeFrancesco, *Nasdaq default: rivals question direct clearing*, RISK.NET (Oct. 18, 2018), <https://www.risk.net/risk-management/6046941/nasdaq-default-raises-questions-over-direct-clearing> [<https://perma.cc/YXM5-9KWK>] (citing Terry Duffy, chairman and chief executive at CME, as noting that CME does not accept individuals as direct clearing members).

192. *Id.*

193. See, e.g., Lars Paulsson & Mikael Holter, *Phantom Trader Who Blew A Hole in World's Oldest Power Market*, BLOOMBERG ECONOMICS (Sept. 17, 2018), <https://www.bloomberg.com/news/articles/2018-09-15/phantom-trader-who-blew-a-hole-in-world-s-oldest-power-market> [<https://perma.cc/SMP7-66BW>].

194. *Id.*

195. *Id.*

196. *Id.*

197. *Id.*

Aas and his associates misjudged the positive impact of carbon emission allowances on German power markets while at the same time failing to anticipate the negative impact of weather forecasts on Nordic power markets.¹⁹⁸ On Monday, September 10, 2018, when markets opened, the spread between these power contracts unexpectedly widened significantly to a level seventeen times larger than normal, forcing Einar Aas into bankruptcy.¹⁹⁹ The market positions taken on by Einar Aas were too big in relation to the liquidity in the market and Einar Aas was unable to answer Nasdaq's calls for additional collateral.²⁰⁰

Nasdaq Clearing tried to manage Einar Aas' default by cutting his trades and selling and auctioning off all of his positions, but the clearinghouse was unable to avoid a loss of €114 million.²⁰¹ To absorb this loss, the CCP first exhausted its own default fund of €7 million and then tapped into a second default fund of €166 million for the remaining difference of €107 million.²⁰² The second default fund was the mutual default fund, which was created by contributions of all of the CCP's non-defaulting clearing members.²⁰³ In relying on the mutual default fund, more than 93% of the losses incurred by the CCP had to be backstopped by its non-defaulting clearing members, which included some of the biggest global banks and derivative traders, such as Morgan Stanley, UBS, Equinor and Norway's state oil company.²⁰⁴

The Nasdaq Clearing example demonstrates that it is not far-fetched to assume that the probability of a CCP failure is much higher than presumed, despite many of the prudential measures implemented at a global level to prevent such failures. It may be true that Nasdaq Clearing relied on the standardized portfolio analysis of risk (SPAN) algorithm to calculate margin, which may be outdated,²⁰⁵ but newer modeling based

198. See, e.g., Clancy, *supra* note 190 (“Aas was betting Nordic and German electricity prices would converge, but changing weather patterns and a shift in German carbon emissions policies instead pushed prices further apart.”).

199. *Id.*

200. *Id.*

201. See, e.g., Luke Clancy, Nasdaq slow to share defaulter info with peer CCPs, RISK.NET (Sept. 21, 2018), <https://www.risk.net/risk-management/5968671/nasdaq-slow-to-share-defaulter-info-with-peer-ccps> [<https://perma.cc/B3WS-SRP9>].

202. See, e.g., Philip Stafford & David Sheppard, *Trader blows €100m hole in Nasdaq's Nordic power market*, FIN. TIMES (Sept. 13, 2018), <https://www.ft.com/content/43c74e02-b749-11e8-bbc3-ccd7de085ffe> [<https://perma.cc/44EG-TD3D>].

203. *Id.*

204. *Id.*; see also Luke Clancy, *After Nasdaq, cracks appear in foundation of clearing: Default fund loss triggers debate on risk sharing, auction rules and 'skin in the game' CCPs*, RISK.NET (Oct. 30, 2018), <https://www.risk.net/risk-management/6079516/after-nasdaq-cracks-appear-in-foundation-of-clearing> [<https://perma.cc/BF2R-JHCV>] (Citing the head of clearing at a large US bank as noting that “[i]f you’re asking general clearing members to step in and backstop your default fund, then you shouldn’t be disintermediating them by bringing members into your clearing house directly...”).

205. See, e.g., Jo Burnham, *Forget the Headlines: What You Really Should Know About The Nasdaq*

on increased back testing or historic value-at-risk (VAR) calculations may not be more reliable.²⁰⁶ In fact, in 2018 at least nine systemically important U.S. banks and U.S. units of foreign banks, which are all clearing members at major interconnected CCPs, saw larger than expected trading losses on at least thirty-four days exceeding their own regulatory value-at-risk (VAR) model estimates by as much as 163%, with some banks exceeding their model outputs three times in as many months.²⁰⁷ What this indicates is that the newer VAR modeling used by these financial institutions may not be accurate and significantly underestimates the frequency and size of actual trading losses.²⁰⁸ This further proves that using newer or more updated risk modeling alone may not be enough to prevent any CCP failures.

V. CASE STUDY

The latest deregulation attempts in the United States may further increase the likelihood of CCP failures and cascading consequences for financial markets.²⁰⁹ Not only is industry standardization lagging

Default, OPENGAMMA (Sept. 28, 2018), <https://opengamma.com/insights/forget-headlines-really-know-nasdaq-default/> [<https://perma.cc/N79D-GTUS>] (“Like many ETD CCPs, Nasdaq used SPAN as the margin algorithm for their power markets.”).

206. *Id.*; see also Pedro Gurrola-Perez, *The validation of filtered historical value-at-risk models*, JOURNAL OF RISK MODEL VALIDATION, VOL. 12, NO. 1, 88-112 (Mar. 2018) (“[B]acktesting is a natural way of testing a percentile forecast, it is not specifically designed to capture other features of the model, such as its efficiency in adapting to new volatility conditions.”).

207. See, e.g., Alessandro Aimone, *At US G Sibs, 11 VAR breaches in 2018*, RISK QUANTUM, RISK.NET (Feb. 21, 2019), <https://www.risk.net/risk-quantum/6412711/at-us-g-sibs-11-var-breaches-in-2018> [<https://perma.cc/8X8V-M836>] (State Street reported three days of VAR breaches in the last quarter of 2018 alone. After exceeding four breaches in a rolling 250-day period banks will be penalized under U.S. rules.); Alessandro Aimone, *Goldman suffers first VAR breach since 2016*, RISK QUANTUM, RISK.NET (Feb. 18, 2019), <https://www.risk.net/risk-quantum/6403726/goldman-suffers-first-var-breach-since-2016> [<https://perma.cc/FR5E-7HEH>] (the banks largest daily loss to its VAR stood at approximately 149%); see also Louie Woodall, *Last orders at the VAR: Inaccurate risk-of-loss estimates threaten to load extra capital charges on U.S. dealers*, RISK.NET (Mar. 8, 2019), <https://www.risk.net/our-take/6455876/last-orders-at-the-var> [<https://perma.cc/ST5P-5HB4>] (“When actual losses exceed modelled estimates, a VAR breach is the result. These are red flags to regulators. Frequent breaches imply a bank’s VAR model is not fit for purpose.”).

208. See, e.g., Woodall, *supra* note 207.

209. See, e.g., Steven T. Mnuchin & Craig S. Phillips, *A Financial System That Creates Economic Opportunities: Capital Markets*, REPORT TO THE PRESIDENT DONALD J. TRUMP, EXECUTIVE ORDER 13772 ON CORE PRINCIPLES FOR REGULATING THE UNITED STATES FINANCIAL SYSTEM (Oct. 2017), <https://www.treasury.gov/press-center/press-releases/Documents/A-Financial-System-Capital-Markets-FINAL-FINAL.pdf> [<https://perma.cc/5HEY-NY5A>] (arguing for international coordination, but also stressing that American interests must be advanced further); Tiffany Hsu, *Treasury Report Calls for Sweeping Changes to Financial Rules*, N.Y. TIMES (Oct. 6, 2017), <https://www.nytimes.com/2017/10/06/business/treasury-financial-rules-dodd-frank.html> [<https://perma.cc/4FX5-2GJR>]; see also REPORT TO THE PRESIDENT OF THE UNITED STATES, ORDERLY LIQUIDATION AUTHORITY AND BANKRUPTCY REFORM 2 (Feb. 21, 2018), https://home.treasury.gov/sites/default/files/2018-02/OLA_REPORT.pdf [[<https://scholarship.law.uc.edu/uclr/vol88/iss2/2>](https://perma.cc/V5UF-</p>
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behind,²¹⁰ but many recent trends seem to indicate the renewed embrace of crisis-era products, such as bundled or synthetic CDS contracts.²¹¹ The positions in CDS contracts that were linked to the Lehman and AIG failures more than doubled in the first seven months of 2017, and trading volumes are up more than 50% when compared to 2016.²¹² At the same time, the total share of outstanding CDS contracts, which are centrally cleared, jumped from 44% at the end of 2016 to 51% at the end of June 2017.²¹³

This increased overall volume of centrally cleared derivative contracts may result in additional risk concentration at CCPs²¹⁴ and further transform the global collateral landscape for clearing members. Higher numbers of centrally cleared derivative contracts requires an increase in posting highly liquid assets for use as collateral, limiting the use of these assets for other investment purposes or as immediately available capital buffers during economic downturns.²¹⁵ The following examples and trends are meant to underline the increased threat to CCP viability from various new developments in financial markets.

YLFB] (noting that “[t]he President directed the Treasury to consider whether an improved bankruptcy process ‘would be a superior method for resolution of financial companies’ as compared to [the Orderly Liquidation Authority.]”); Jeffrey N. Gordon & Mark J. Roe, *Financial Scholars Oppose Eliminating “Orderly Liquidation Authority” As Crisis-Avoidance Restructuring Backstop 2* (May 23, 2017), https://www.law.columbia.edu/sites/default/files/microsites/law-economics-studies/scholars_letter_on_ola_-_final_for_congress.pdf [<https://perma.cc/6VUN-B9ZJ>] (arguing that the repeal of OLA would be dangerous).

210. See, e.g., Joanna Wright, *Giancarlo urges EU to protect CCP equivalence deal*, RISK.NET (Oct. 26, 2017), <https://www.risk.net/regulation/5349426/giancarlo-urges-eu-to-protect-ccp-equivalence-deal> [<https://perma.cc/9SD7-P7TC>]; see also J. Christopher Giancarlo, *An EU Plan to Invade U.S. Markets: In response to Brexit, Brussels looks to expand its reach*, WALL ST. J. (Nov. 5, 2017), <https://www.wsj.com/articles/an-eu-plan-to-invade-u-s-markets-1509907579> [<https://perma.cc/8WR5-TGAZ>] (arguing that overlapping and uncoordinated regulation in the EU and the US would be disruptive, expensive and detrimental to the U.S. trading markets and economy).

211. See, e.g., Joe Rennison, *Investors pour back into crisis-era credit product*, FIN. TIMES (Aug. 23, 2017), <https://www.ft.com/content/c4d815b2-86bc-11e7-bf50-e1c239b45787> [<https://perma.cc/9UJA-BGP3>]; Joe Rennison & Eric Platt, *Wall Street banks ride boom in leverage loans as volumes soar*, FIN. TIMES (Oct. 29, 2017), <https://www.ft.com/content/7882045e-bb5d-11e7-9bfb-4a9c83ffa852> [<https://perma.cc/RFR2-XXAZ>] (reporting that Wall Street banks have set new records underwriting leveraged loans in 2017).

212. *Id.*; see also *Statistical release: OTC derivatives statistics at end-June 2017*, BANK FOR INTERNATIONAL SETTLEMENTS, at 2-5 (Nov. 2, 2017), https://www.bis.org/publ/otc_hy1711.pdf [<https://perma.cc/F9BL-ZTNV>] (noting that the overall notional amount for derivative contracts has risen by a lower percentage rate compared to 2016 and that the gross market value of outstanding OTC derivative contracts is at its lowest level since 2007) [hereinafter *BIS end-June 2017 Statistical release*].

213. *BIS end-June 2017 Statistical release*, *supra* note 212, at 5.

214. *Id.*

215. See, e.g., Int’l Swaps and Derivatives Ass’n (ISDA), *Research Study: ISDA Margin Survey 2017*, at 8 (Sept. 2017), <https://www.isda.org/a/VeiDE/margin-survey-final1.pdf> [<https://perma.cc/8L8P-7JMJ>] (noting that initial margin for cleared derivatives reached \$173.4 billion as of March 3, 2017, including an increase of 13.7% for CDS between the third quarter of 2015 and the first quarter of 2017, from \$28.4 billion to \$32.3 billion).

A. Exchange Traded Funds and Exchange Traded Notes

Various new financial products and investment vehicles, such as Exchange Traded Funds (ETFs) and Exchange Traded Notes (ETNs), which are backed by derivatives, may pose a particular danger to CCPs.²¹⁶

ETFs and ETNs are traded on major exchanges, including the New York Stock exchange, and may both be defined as marketable securities, which base their performance on an index or a specific class of assets. ETFs primarily track shares of stock, commodities, bonds, or foreign currencies, but may also be based on leveraged loans and CLOs.²¹⁷ ETNs, on the other hand, are unsecured debt instruments dependent on the credit ratings of the issuer.²¹⁸

Exchange Traded Funds hold assets in excess of \$4 trillion globally and are predicted to reach \$6 trillion in assets by 2020.²¹⁹ Yet, no jurisdiction has a specific set of regulations for ETFs. Rather, ETFs are governed by a patchwork of stock exchange rules and securities regulations.²²⁰ In addition, there is significant disagreement over whether

216. See, e.g., Jennifer Thompson, *Regulators descend on booming ETF market*, FIN. TIMES (Sept. 9, 2017), <https://www.ft.com/content/d24fc1d6-60a1-11e7-8814-0ac7eb84e5f1> [<https://perma.cc/RFP6-FN39>] (reporting that mid-year 2017 ETFs accounted for more than \$4Tn in assets compared to \$580bn in 2006 and that ownership and pricing information is not easily available). The main problem for transparency and the determination of risk exposure linked to ETFs is the fact that there is no specific set of regulations for ETFs; various securities regulations and exchange rules apply to ETFs. See also Peter Smith, *Vanguard chief dismisses ETF bubble fears*, FIN. TIMES (Sept. 3, 2017), <https://www.ft.com/content/691e2a14-8f35-11e7-a352-e46f43c5825d> [<https://perma.cc/8P36-W2XS>] (Mr. McNabb is quoted as noting that he doesn't "think what is happening in ETFs is systemic.").

217. See *supra* Part I; see also Press Release, *Highland Capital Management Announces Launch of Dedicated CLO UCITS Fund*, HIGHLAND CAPITAL (Jun. 11, 2018), <https://www.highlandcapital.com/highland-capital-management-announces-launch-of-dedicated-clo-ucits-fund/> [<https://perma.cc/J37C-SAQC>] (noting that CLOs offer yields that often exceed similar rated credit instruments, which is due in part to their complexity).

218. See *infra* note 226.

219. See, e.g., Central Bank of Ireland Press Release, *Exchange Traded Funds – Central Bank Publishes Discussion Paper*, CENTRAL BANK OF IRELAND (May 15, 2017), <https://www.centralbank.ie/news-media/press-releases/exchange-traded-funds-discussion-paper> [<https://perma.cc/2ERA-XQFC>]; see also *Exchange Traded Funds*, CENTRAL BANK OF IRELAND 7 (May 15, 2017), <https://www.centralbank.ie/docs/default-source/publications/discussion-papers/discussion-paper-6/discussion-paper-6---exchange-traded-funds.pdf?sfvrsn=6> [<https://perma.cc/H2K3-ZJMR>]. While the U.S. makes up more than ¾ of the market, \$358bn of assets in ETFs are registered in Ireland. See, e.g., Jennifer Thompson, *Regulators descend on booming ETF market*, FIN. TIMES (Sept. 9, 2017), <https://www.ft.com/content/d24fc1d6-60a1-11e7-8814-0ac7eb84e5f1> [<https://perma.cc/D6SD-F7H6>]. In the final weeks of 2019, the global net ETF inflows reached \$570.5 billion, which is up by 10.6 percent when compared to 2018. New business for BlackRock's iShare ETFs rose by 8.2 percent to \$180.2 billion and ETF inflows for Vanguard increased by a total of 28 percent to \$118.8 billion. See, e.g., Chris Flood, *ETF providers end 2019 on high with record assets*, FIN. TIMES (Jan. 12, 2020), <https://www.ft.com/content/0b04a590-0fcc-4a2f-8453-cf753aa847a9>.

220. ETFs are required to comply with all of the disclosure mandates in the Securities Act of 1933 and the Securities Exchange Act of 1934. If an ETF is organized, it must further comply with the Investment Company act of 1940. See, e.g., Henry T.C. Hu & John Morely, *A Regulatory Framework for Exchange-Traded Funds*, 91 S. CAL. L. REV. 839, 844 (2018) (arguing that current regulation has a

ETFs should be regulated as investment advisers or should be considered an asset class in and of itself.²²¹

Regulators do not understand the structure of ETFs well enough in order to appropriately assess the risk involved with these products.²²² In addition, similarly to the role of derivatives during the Great Recession, ETFs may trigger another systemic event due to their lack of transparency.

For example, during the first half of 2017, U.S. domiciled ETFs had a net inflow of over \$240 billion, yet during the same period of time 36 ETFs were forced to close.²²³ The number of closures accelerated further in 2018.²²⁴ As of April 2018, 70 EFTs had been closed since the beginning of the year, an increase of almost 50% compared to 2017.²²⁵ This alone may not necessarily cause reason for concern, but what this trend demonstrates is that the opening and closing of these funds seem erratic and unpredictable and may possibly impact the overall volatility of financial markets.²²⁶

“cubbyhole” problem, squeezing ETFs into a regulatory framework the is not sufficient is intended for older, very different financial products); *see also* Carolina Wilson and Sarah Ponczek, *ETF Rule Is On The SEC’s Front Burner, or So Wall Street Hopes*, BLOOMBERG (June 11, 2018), <https://www.bloomberg.com/news/articles/2018-06-08/etf-rule-is-on-the-sec-s-front-burner-or-so-wall-street-hopes> (arguing that the SEC “appears on track to remove hurdles for exchange-traded funds getting to market”). Please note, effective December 23, 2019, the SEC adopted new rules to regulate ETFs. *Exchange Traded Funds, Investment Company Act Release No. 33646*, SECURITIES AND EXCHANGE COMMISSION (Sep. 25, 2019) (“Rule 6c-11 Adopting Release”), <https://www.sec.gov/rules/final/2019/33-10695.pdf>. Also, on September 25, 2019, the SEC granted a conditional exemption from certain Exchange Act rules to further reduce regulatory complexity for ETFs. *Order Granting A Conditional Exemption From Exchange Act Section 11(d)(1) and Exchange Act Rules 10b-10, 15C1-5, 15C-6, And 14E-5 For Certain Exchange Traded Funds, Release No. 34-87110*, SECURITIES AND EXCHANGE COMMISSION (Sept. 25, 2019), <https://www.sec.gov/rules/exorders/2019/34-87110.pdf>; *see also*, Chris Flood, *US regulator overhauls requirements for launching ETFs*, FIN. TIMES (Sept. 26, 2019), <https://www.ft.com/content/97b07b9a-e06c-11e9-b112-9624ec9edc59> (noting that the reform is “intended to encourage more[ETF] providers to enter the fast-growing sector” and to “[sweep] away a cumbersome approval process.”).

221. *See, e.g.*, CENTRAL BANK OF IRELAND, *Exchange Traded Funds*, *supra* note 219, at 9; *Principles for the Regulation of Exchange Traded Funds*, BOARD OF THE INTERNATIONAL ORGANIZATIONS OF SECURITIES COMMISSIONS (June 2013), <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD414.pdf> [<https://perma.cc/ZJA8-HN4Q>]; *see also* Gerrard Cowan, *Just as in U.S., Europe Debates How to Regulate ETFs: Global regulators need to develop ‘a common language of risk,’* WALL ST. J. (Dec. 3, 2017), <https://www.wsj.com/articles/just-as-in-u-s-europe-debates-how-to-regulate-etfs-1509937500> [<https://perma.cc/CS4Z-H6CS>].

222. *See, e.g.*, Hu & Morely, *supra* note 220, at 863-865.

223. *See, e.g.*, Elisabeth Kashner, *Staying out of the ETF Graveyard*, INSIGHT (Jun. 21, 2017), <https://insight.factset.com/staying-out-of-the-etf-graveyard> [<https://perma.cc/RXP7-BHGA>]. For an updated list of ETF closures, *see* Heather Bell, *ETF Closures*, ETF.COM (Apr. 17, 2018), <http://www.etf.com/etf-watch-tables/etf-closures?nopaging=1> [<https://perma.cc/LA7Z-47W2>].

224. *Id.*

225. *Id.*

226. *Id.*; *see also* Robin Wigglesworth, *How a volatility virus infected Wall Street*, FIN. TIMES (Apr. 11, 2018), <https://www.ft.com/content/be68aac6-3d13-11e8-b9f9-de94fa33a81e>

Even more concerning is that less than 1% of ETFs receive more than half of all investments, resulting in a significant concentration of risk.²²⁷ The funds receiving most of the money are also the industry's oldest ETFs that have been listed and traded for the longest time. One good example is the iShares ETF fund series by BlackRock, which took in more than \$70 billion in investments during the second quarter of 2017 alone.²²⁸ While investments in more established funds might generally be considered a good outcome, regulators do not treat new and old ETFs equally.²²⁹

Specifically, ETFs approved and listed for the longest time are not exposed to the same level of regulatory scrutiny as newer ETFs²³⁰ and are not limited to increase their exposure to derivatives.²³¹ The exponential growth of ETFs as well as their increasing exposure to derivatives may therefore transfer even more systemic risk to CCPs.

It may also be noteworthy that some ETFs²³² and other similar funds²³³

[<https://perma.cc/Y9U3-3ZSQ>] (describing the inherent volatility of ETNs using the collapse of XIV on February 2, 2018 as an example: "The US stock market suffered one of the swiftest 10 per cent slumps in history, and global equities lost \$4.2tn that week. In terms of dollars, that is more than the total losses suffered by the Nasdaq index when the dotcom bubble burst.")

227. See, e.g., Ryan Vlastelica, *Less than 1% of ETFs getting half of all inflows in 2017*, MARKETWATCH (July 20, 2017), <https://www.marketwatch.com/story/less-than-1-of-etfs-getting-half-of-all-inflows-in-2017-2017-07-19> [<https://perma.cc/HFP3-2EWU>].

228. *Id.*; see also Sarah Krouse, *Blackrock's earnings rise but fall short of views*, MARKETWATCH (July 17, 2017), <https://www.marketwatch.com/story/blackrocks-earnings-rise-but-fall-short-of-views-2017-07-17-124852329> [<https://perma.cc/S7VU-KW2J>].

229. See, e.g., Hu & Morely, *supra* note 220, at 885 (arguing that the inconsistency between old and new funds "is made worse by a quirk of law that allows old advisers not only to continue operating old funds under old regulatory policies, but also to create new funds under old regulatory policies.")

230. See, e.g., BATS Global Markets, Inc., *Re: Request for Comment on Exchange Traded Products 2* (Jan. 14, 2016), <https://www.sec.gov/comments/s7-11-15/s71115-40.pdf> [<https://perma.cc/64WY-PC7V>] (arguing that "inconsistent standards and treatment result in a competitive disadvantage to both issuers and exchanges as it relates to previously approved ETFs that are already listed and traded on another exchange because, in almost all instances, such previously approved ETFs were not subject to the same level of standards or restriction applied by Commission staff to the newer ETF, restricting the ETFs ability to compete with nearly identical ETFs already in the market.")

231. See, e.g., Norm Cham, Director, Div. of Inv. Mgmt., U.S. Sec. & Exch. Comm'n, Remarks to the ALI CLE 2012 Conference on Investment Adviser Regulation: Legal and Compliance Forum on Institutional Advisory Services (Dec. 6, 2012), <https://www.sec.gov/news/speech/2012-spch120612nchtm> [<https://perma.cc/S5FP-SQM5>] (noting that "[a]lthough the Division continues its ongoing review of the use of derivatives by funds, Division staff will no longer defer consideration of exemptive requests under the Investment Company Act relating to actively-managed ETFs that make use of derivatives"); see also Press Release, U.S. Sec. & Exch. Comm'n, SEC Staff Evaluating the Use of Derivatives by Funds (March 25, 2010), <https://www.sec.gov/news/press/2010/2010-45.htm> [<https://perma.cc/M7YP-KNTM>].

232. See, e.g., *Business Development Company ETFs*, ETFDB.COM, <https://etfdb.com/etfs/industry/business-development-company/> [<https://perma.cc/K67Y-TPKY>] ("Business Development Company ETFs invest in business development companies (BDCs), which are involved in helping grow small companies in the initial stages of their development.")

233. Similar funds are closed-end-funds (CEFs), which trade shares on exchanges, but are not considered an ETF per se. An example of a CEF that invest in direct lending is the Stone Ridge Alternative

base some of their performance on mid-market lending indexes or investments.²³⁴ Mid-market lending, or so-called private debt financing, typically does not involve banks and is facilitated by specialized lenders, insurance companies, or so-called business development companies under the Investment Company Act of 1940 (ICA).²³⁵ Most of these lenders are also often referred to as shadow banks, which are defined as non-bank financial intermediaries that provide services similar to banks, but outside of any regulatory oversight.²³⁶

The U.S. market in private debt, which provides about 4% of U.S. corporate debt financing and is largely unsecured or based on subordinate debt,²³⁷ has more than doubled in size since 2010, reaching nearly \$1trillion in 2018.²³⁸ Due to the lack of regulatory oversight and the

Lending Risk Premium Fund, LENDX:US. *Prospectus*, STONE RIDGE (2019), https://www.stoneridgefunds.com/documents/LENDX_prospectus.pdf [<https://perma.cc/8ZKQ-RZAX>].

234. See, e.g., Stephen L. Nesbitt, *The Investment Opportunity in U.S. Middle Market Direct Lending*, *THE JOURNAL OF ALTERNATIVE INVESTMENTS*, VOL. 20(1), 92-99 (Summer 2017) (“Direct lending to U.S. middle market companies is drawing increasing interest and capital from investors seeking high current yield and price stability”); see also Larry Swedroe, *Private Credit Performance*, ETF.COM (Nov. 21, 2018), <https://www.etf.com/sections/index-investor-corner/swedroe-private-credit-performance?nopaging=1> [<https://perma.cc/CC6N-RF28>] (“The increase of both supply and demand for private credit has resulted in substantial growth in assets under management.”).

235. 15 U.S.C. § 80a-54 (1996); see also Nesbitt, *supra* note 234, at 92 (“Direct lending generally covers loans made to U.S. middle market companies without the traditional intermediary role of a bank or broker.”).

236. See, e.g., Ben S. Bernanke, Chairman, Federal Reserve, Speech At the Russell Sage Foundation and The Century Foundation Conference on “Rethinking Finance”: Some Reflections on the Crisis and the Policy Response (Apr. 13, 2012), <https://www.federalreserve.gov/newsevents/speech/bernanke20120413a.htm> [<https://perma.cc/2QNY-Z9XV>] (“Shadow banking, as usually defined, comprises a diverse set of institutions and markets that, collectively, carry out traditional banking functions—but do so outside, or in ways only loosely linked to, the traditional system of regulated depository institutions. Examples of important components of the shadow banking system include securitization vehicles, asset-backed commercial paper (ABCP) conduits, money market mutual funds, markets for repurchase agreements (repos), investment banks, and mortgage companies. Before the crisis, the shadow banking system had come to play a major role in global finance.”).

237. See, e.g., Swedroe, *supra* note 234.

238. The exact numbers of middle market lending differ somewhat between approximately \$700 and \$909 billion, which is due to the lack of comprehensive third-party data. See, e.g., Robin Wigglesworth, *Non-bank lenders thrive in the shadows*, *FIN. TIMES* (Feb. 3, 2019), <https://www.ft.com/content/4610e820-1b09-11e9-9e64-d150b3105d21> [<https://perma.cc/M78B-6EPY>] (referencing a volume of \$700 billion based on Bank of America data). For a higher market size of outstanding loans, see *Opportunities in Global Direct Lending: A Historical and Prospective View of the U.S. and European Markets*, ARES MGMT. LP 11-12 (Apr. 2018), https://www.aresmgmt.com/media/458997/2018-Direct-Lending-White-Paper_vF-3-.pdf [<https://perma.cc/DA9P-SLYV>] (estimating the market size in 2017 at \$909 billion); see also Sally Bakewell & Christopher Cannon, *Investors Are Piling Into Loans That Banks Have Avoided Since The Crash*, *BLOOMBERG* (Dec. 17, 2018), <https://www.bloomberg.com/graphics/2018-private-credit-yields/> [<https://perma.cc/4V8C-YUWZ>] (“It’s private credit, and it has transformed the oldest game in banking: loans. In the decade since the crisis, investors have poured vast sums of money at companies that are generally too small or too risky for sober bankers.”).

private club like nature of middle market lending only very little is known about the overall size and risk profile of these markets.²³⁹ With the massive inflows of money into private debt and mid-market lending, numerous other factors may significantly increase raise corporate default risks.²⁴⁰ For example, the economic outlook for 2020 remains unpredictable as the U.S. Federal Reserve has heavily intervened in repo markets in 2019.²⁴¹ Moreover, a global liquidity trap with the potential of undermining the ability to effectively manage economic swings through monetary policy is looming²⁴² and unpredicted interest rate adjustments by the U.S. Federal Reserve may also still be possible.²⁴³ If any credit-default-swap protection has been sold to hedge against these risks, the long-term viability of CCPs may further be threatened by these defaults.

239. See, e.g., Shawn Munday, Wendy Hy, Tobias True & Jian Zhang, *Performance of Private Credit Funds: A First Look*, THE JOURNAL OF ALTERNATIVE INVESTMENTS, VOL. 21 (2), 31, 38-41 (Fall 2018) (analyzing 476 different private credit funds.); see also Jean Eaglesham & Coulter Jones, *The Fuel Powering Corporate America: \$2.4 Trillion in Private Fundraising*, WALL ST. J. (Apr. 3, 2018), <https://www.wsj.com/articles/stock-and-bond-markets-dethroned-private-fundraising-is-now-dominant-1522683249> [<https://perma.cc/SX4K-ATYQ>].

240. See, e.g., Richard J. Shinder, *Commentary: The coming crackdown in middle market corporate credit*, PENSIONS & INVESTMENTS (Nov. 20, 2018), <https://www.pionline.com/article/20181120/ONLINE/181129999/commentary-the-coming-crackup-in-middle-market-corporate-credit> [<https://perma.cc/5KSU-3C2R>] (“Nobody can be certain when the next financial crisis will hit. What seems increasingly likely is that middle-market credit will be in its crosshairs when it does.”); see also Robin Wigglesworth, *Non-bank lenders thrive in the shadows*, FIN. TIMES (Feb. 3, 2019), <https://www.ft.com/content/4610e820-1b09-11e9-9e64-d150b3105d21> [<https://perma.cc/S3U6-BZN9>] (quoting the head of a credit hedge fund as noting: “It puzzles me, . . . [t]hey are lending to complete sh[**] at a spread of 100-150 basis points above yield.”).

241. See, e.g., Colby Smith & Joe Rennison, *Grim repo: how the Fed plans to return crucial market to normal*, FIN. TIMES (Jan. 1, 2020), <https://www.ft.com/content/8ffb6f9a-2be9-11ea-a126-99756bd8f45e> [<https://perma.cc/2ATE-LJWN>] (noting that “[b]y injecting tens of billions of dollars into the financial system [since the end of 2019], in form of daily and longer-term repo loans and outright purchases of Treasury bills, the Fed ensured there was enough cash swilling around to prevent market rates from spiking higher.”).

242. See, e.g., Lionel Barber & Chris Giles, *Central banks running low on ways to fight recession, warns Mark Carney*, FIN. TIMES (Jan. 7, 2020), <https://www.ft.com/content/713a70b4-315d-11ea-a329-0bcf87a328f2> [<https://perma.cc/N9X4-LX96>] (quoting Mark Carney the Governor of the Bank of England noting that “[i]f there were to be a deeper downturn, [that requires] more stimulus than a conventional recession, then it’s not clear that monetary policy would have sufficient space.”).

243. See, e.g., Heather Long, *Federal Reserve predicts on interest rate cuts in 2020, ignoring Trump’s calls to boost the economy*, WASH. POST (Dec. 11, 2019), <https://www.washingtonpost.com/business/2019/12/11/federal-reserve-predicts-no-interest-rate-cuts-ignoring-trumps-calls-boost-economy/> [<https://perma.cc/YZ6E-YE9Q>] (“Powell left the door open to changing interest rates in 2020, but he stressed there is a high bar for moving rates up or down.”); see also Jeff Cox, *The new-look Fed seems committed to low rates, but will face challenges if one thing changes*, CNBC.COM (Jan. 3, 2020), <https://www.cnbc.com/2020/01/03/fed-committed-to-low-rates-but-faces-challenges-if-inflation-changes.html> [<https://perma.cc/AQ3H-UVJ8>] (noting that “[s]hould economic growth and inflation in particular pick up, the Fed very well could have to tighten [interest rates]...”).

B. Unconventional Credit Events

Another example of risk exposure for CCPs is unconventional or so-called narrowly tailored credit events (NTCEs). These events are artificially created defaults, which are intended to be triggered intentionally by market participants in order to benefit themselves.²⁴⁴

In a recent case,²⁴⁵ the U.S. homebuilder Hovnanian agreed to intentionally default on some of its existing debt obligations in order to secure more favorable refinancing terms from Blackrock.²⁴⁶ At no time was Hovnanian in financial distress or unable to service its debt.²⁴⁷

In anticipation of the proposed debt refinancing between Hovnanian and Blackrock, Blackrock bought over \$300 million in CDS protection referencing Hovnanian and betting that the homebuilder would default.²⁴⁸ Of course, Blackrock knew that if Hovnanian would accept the proposed refinancing agreement that the homebuilder would be required to default on the referenced debt. Blackrock's goal of creating this unconventional credit event and forcing Hovnanian to intentionally default was to directly benefit the hedge fund and to offset the cost of granting Hovnanian more favorable repayment terms.²⁴⁹ Because Blackrock was a CDS protection buyer on Hovnanian's debt obligations, the hedge fund was entitled to receive payments on its CDS contracts after Hovnanian's artificially created default.²⁵⁰

Creating unconventional credit events challenge some basic fundamentals of derivative markets, such as the assumption that CDS issuers do not intentionally default on their debt obligations.²⁵¹ The fact

244. Fabien Carruzzo, Stephen Zide, & Daniel King, *iHeart, and Other Unconventional CDS Credit Events*, WESTLAW (May 17, 2017), <https://www.kramerlevin.com/images/content/2/5/v4/2551/iHeart-20and-20Other-20Unconventional-20CDS-20Credit-20Events.pdf> [<https://perma.cc/929B-JNZ3>].

245. *Solus Alt. Asset Mgmt. LP. v. GSO Capital Partners L.P.*, No. 18-CV-00232-LTS-BCM, 2018 WL 620490, at *1 (S.D.N.Y. Jan 29, 2018).

246. *Id.* at *2-10.

247. *Id.*

248. *Id.* (noting that as part of the agreement Hovnanian was barred from making 2018 interest payments in the amount of \$1.04 million resulting in a failure-to-pay credit event determination by the ISDA Credit Derivatives Determinations Committee); see, e.g., Joe Rennison, *Blackrock-led debt sparks outcry*, FIN. TIMES (Jan. 11, 2018) <https://www.ft.com/content/69194bda-f5af-11e7-88f7-5465a6ce1a00> [<https://perma.cc/G5MQ-R8KH>]; Helen Bartholomew, *Fixing CDSs: lots of patches, no magic wand*, RISK.NET (Apr. 20, 2018) <https://www.risk.net/derivatives/5532846/fixing-cdss-lots-of-patches-no-magic-wand> [<https://perma.cc/ZRS5-BW2E>]; see also Andrew Scurria, *Home Builder Accused of Default Swap Scheme With Blackrock Unit*, WALL ST. J. (Dec. 2, 2017), <https://www.wsj.com/articles/home-builder-accused-of-default-swap-scheme-with-blackstone-unit-1512168887> [<https://perma.cc/93SB-NPHU>].

249. E.g., *Solus Alt. Asset Mgmt.*, 2018 WL 620490, at *4 (the court summarized that the purpose was to “maximize recovery for [Blackrock] under an CDS failure to pay Credit Event...”).

250. See Bartholomew, *supra* note 248 (“[T]he two firms had found a way to burn down an empty house and split the payout.”).

251. See, e.g., Declaration of Robert Pickel in Support, *Solus Alt. Asset Mgmt. LP. v. GSO Capital*

that issuers do so may impact the overall value of CDS contracts and their respective risk profiles. CDS protection may become uneconomical and prove too expensive for protection buyers. In the future, we may also see an increasing number of technical defaults in order to secure favorable refinancing or debt restructuring. During periods of economic downturn, these unconventional defaults may occur in addition to true defaults potentially overburdening CCP risk protection systems.²⁵²

Courts generally seem unsympathetic to disputes related to these complex transactions and are hesitant to unscramble them, unless damages are more than economic in nature.²⁵³ Courts also consider any potential harm to the public as limited and view CDS traders and brokers as a relatively insular and sophisticated subset of the public.²⁵⁴ In addition, CDS market participants are further viewed as being able to easily address the risk of unconventional credit events by amending their contractual obligations.²⁵⁵

What this view does not sufficiently take into account is what impact the behavior of a sophisticated subset of the public may have on the greater public and specifically if this behavior results in the failure of one or more CCPs.²⁵⁶ In fact, rather than eliminating moral hazard, this view may once again foster an environment in which a certain group of investors and financial companies simply expects a public bailout, which in turn undermines the credibility of CDS markets.

In early 2018, the CFTC has called for action and threatened to investigate any manufactured defaults unless the financial industry comes

Partners L.P., Hovnanian Enter., Inc. et al., No. 18-CV-00232-LTS-BCM, Docket Entry No. 9, ¶5 (S.D.N.Y. Jan. 11, 2018) (arguing that “[t]here is an underlying assumption in CDS trades that the companies (“reference entities”) that issue the debt securities referenced in CDS trades will endeavor whenever financially possible to make good on their obligations and avoid payment defaults.”).

252. The argument that many of the CDS contracts involved may only be bilateral or single named and not centrally cleared contracts misses the point that the described behavior impacts the fundamentals of all derivative markets including those of standardized CDS contracts. In addition, single-name contracts cleared with CCPs for 44% of outstanding notionals at the end of 2017. *See, e.g.*, Louie Woodall, *CDS market structure reformed – BIS*, RISK.NET (Jun. 6, 2018), <https://www.risk.net/risk-quantum/5670786/cds-market-structure-transformed-bis> [<https://perma.cc/8V6F-8KQN>]; *see also* Bank of International Settlements, *BIS Quarterly Review: International banking and financial market developments* 6 (June 2018), https://www.bis.org/publ/qtrpdf/r_qt1806.pdf [<https://perma.cc/LD8C-UYHU>] (noting that “[a]t end-December 2017, the share of all single-name contracts (in terms of notional amounts) cleared with CCPs stood at 44%, compared with 65% for multi-name contracts.”).

253. *See, e.g.*, *Solus Alt. Asset Mgmt.*, 2018 WL 620490, at *4 (the court notes “that any proliferation of engineered defaults that did occur could likely be mitigated by the actions on the part of ISDA.”).

254. *Id.* at *6.

255. *Id.* at *14-15.

256. *See, e.g.*, Davide Scigliuzzo, *CFTC steps into debate on voluntary defaults*, REUTERS (Apr. 27, 2018) <https://www.reuters.com/article/us-cftc/cftc-steps-into-debate-on-voluntary-defaults-idUSKBN1HY2FY> [<https://perma.cc/5JA9-ZQQL>].

up with an appropriate fix to prevent these events.²⁵⁷ After a year-long consultation,²⁵⁸ the International Swaps and Derivatives Association (ISDA)²⁵⁹ responded and introduced a new causation test to determine when a failure-to-pay event shall trigger payouts on credit events.²⁶⁰ The new test requires that any such event must result from deterioration in creditworthiness or financial condition.²⁶¹ Rather than introducing a rule-based approach, this test provides for discretion and introduces an element of subjectivity.²⁶² While the goal of the new causation test seems to be to prevent gaming the test,²⁶³ only time will tell whether this test is workable or effective.²⁶⁴ As described below, the latter is particularly questionable in light of the indecisiveness of the ISDA's Determinations Committees' decision making, which appears to favor a more rule-based and bright line

257. See, e.g., U.S. Commodity Futures Trading Comm'n, *Statement on Manufactured Credit Events* (Apr. 24, 2018), <https://www.cftc.gov/PressRoom/SpeechesTestimony/divisionsstatement042418> [<https://perma.cc/7WTP-UJKV>] ("Market participants and their advisors are advised that in instances of manufactured credit events, the Divisions will carefully consider all available actions to help ensure market integrity and combat manipulation or fraud involving CDS, in coordination with our regulatory counterparts, when appropriate."); see also Kris Devasabai & Helen Bartholomew, *CTFC probes CDS market under last enforcement head*, RISK.NET (May 8, 2018), <https://www.risk.net/derivatives/5576906/cftc-probed-cds-market-under-last-enforcement-head> [<https://perma.cc/LZ9M-JUJU>] ("The former head of the US Commodity Futures Trading Commission's division of enforcement [Aitan Goelman] has backed the agency's efforts to clamp down on 'manufactured' credit default swap payouts, in which a market participant strikes an agreement with the reference entity, helping both firms but potentially hurting other CDS users.").

258. See, e.g., ISDA Board Statement on Narrowly Tailored Credit Events, Int'l Swaps and Derivatives Ass'n (Apr. 11, 2018), <https://www.isda.org/a/6UmEE/ISDA-Board-Statement-on-Narrowly-Tailored-Credit-Events.pdf> [<https://perma.cc/RM4W-9S8B>] ("We have . . . instructed the ISDA staff, as part of its ongoing dialogue with the market, to consult with market participants and advise the Board on whether further amendments to the ISDA Credit Derivatives Definitions should be considered"); see also Bartholomew, *supra* note 248 (quoting Robert Pickel, former ISDA chief executive, as noting that "A lot of the possible fixes are just band-aids and don't go to the fundamental issue of whether this is an appropriate use of credit derivatives").

259. See also *infra* Section V.C.

260. See, e.g., Proposed Amendments to the 2014 ISDA Credit Derivatives Definitions Relating to Narrowly Tailored Credit Events, Int'l Swaps and Derivatives Ass'n, 2 (March 6, 2019), <https://www.isda.org/a/nyKME/20190306-NTCE-consultation-doc-complete.pdf> [<https://perma.cc/6CB2-PZ6G>] ("The definition of the Failure to Pay Credit Event (Section 4.5 of the Definitions) will be amended to add a requirement that the relevant payment failure result from or in a deterioration in creditworthiness or financial condition of the Reference Entity. This requirement would apply to corporate and financial Reference Entities but would not apply to sovereign Reference Entities.").

261. *Id.*

262. See, e.g., Helen Bartholomew, *Isda proposes fix for 'manufactured defaults'*, RISK.NET (Mar. 6, 2019), <https://www.risk.net/derivatives/6451091/isda-proposes-fix-for-manufactured-defaults> [<https://perma.cc/XA26-UF3G>] (quoting Mark New, special counsel at ISDA of the Americas, as noting the test will inject an element of subjectivity in the determinations process, which is viewed preferable to a rules-based, tick-box approach that could be more easily gamed).

263. *Id.*

264. *Id.* (Noting that "[u]sing the same test for failure-to-pay events is not without risks. Isda's determination committee has generally favoured rules-based, 'bright line' tests, which provide legal certainty.").

test.²⁶⁵

C. ISDA Determinations Committee Refusals

The indecisiveness or inability of specially established decision-making bodies to declare whether a credit event has occurred may also result in significant market uncertainties and increase risk for CCPs.²⁶⁶ Derivative contracts often outsource the determination of credit or default triggering events to special decision-making bodies that may be created by various trade associations.

The most prominent examples of such decision-making bodies are the International Swaps and Derivatives Association (ISDA) Determinations Committees. Without a doubt, the ISDA is the most important trade organization of participants in derivative markets globally.²⁶⁷ The organization has more than 850 members in over 60 different countries.²⁶⁸ ISDA is not uncontroversial and, among other activities, dominates markets through the use of the ISDA Master Agreement, which is a standardized contract used almost exclusively for every derivative transaction around the world.²⁶⁹ After the financial crisis, ISDA established so-called determinations committees, which are tasked to judge when a company is in default on their CDS contracts.²⁷⁰

The ISDA Determinations Committees were established in direct response to Lehman's failure and are meant to prevent any additional confusion in financial markets by avoiding long, drawn-out litigation.²⁷¹ Made up of representatives of banks and investors, and with a view of

265. *Id.*

266. See, e.g., Philip Stafford, *ICE drops out of Isda credit-derivatives committee role*, FIN. TIMES (Oct. 6, 2017), <https://www.ft.com/content/c695222f-7d10-3288-a5fd-be4858105a52> [<https://perma.cc/7UTN-LXJ4>] (describing the uncertainty created by the Isda committee's decision about Nobel Inc.'s possible default).

267. See, e.g., John Biggins and Colin Scott, *Private Governance, Public Implications, and the Tightrope of Regulatory Reform: The ISDA Credit Derivatives Determinations Committee 7* (Comparative Research in Law and Political Econ, Research Paper No. 57/2013, 2013) <https://digitalcommons.osgoode.yorku.ca/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1299&context=clpe> [<https://perma.cc/ML3U-CNGG>].

268. See, e.g., *About ISDA*, INT'L SWAPS AND DERIVATIVES ASS'N, <https://www.isda.org/about-isda/> [<https://perma.cc/XG2Y-2QBX>]; *ISDA Members*, INT'L SWAPS AND DERIVATIVES ASS'N, <https://www2.isda.org/membership/members-list/> [<https://perma.cc/84GZ-86BK>].

269. See, e.g., CASTAGNINO, *supra* note 45 at 187-190; see also, PARKER, *supra* note 41, at 14-18.

270. See, e.g., Robert Smith and David Shepard, *Noble Group Ltd: World biggest banks square off over Noble credit default swaps*, FIN. TIMES, (Aug. 27, 2018), <https://www.ft.com/content/1e20366e-89b9-11e7-8bb1-5ba57d47eff7> [<https://perma.cc/F56B-S2K5>].

271. See, e.g., Stafford & Sheppard, *supra* note 188; see also Lianting Tu, *Noble Default-Swap Verdict in Play as Test of ISDA System*, BLOOMBERG (Sept. 5, 2017), <https://www.bloomberg.com/news/articles/2017-09-05/noble-group-default-swap-verdict-in-play-as-test-of-isda-system> [<https://perma.cc/GUG4-ZHNA>].

eliminating bilateral settlements, the creation of these committees was thought to address the legal and economic basis risk in CDS markets.²⁷² The committees were developed with the additional goal of facilitating central clearing and directly addressing any related concerns about operational complexity.²⁷³

Yet, in late 2017, the ISDA Determinations Committee repeatedly refused to decide the question of whether Noble Group Ltd. defaulted on its debt in June of 2017 and eventually dismissed the question.²⁷⁴ In addition, the Determinations Committee also suspended any payments on Noble's debt pending further evaluation of the credit event.²⁷⁵

After a huge accounting scandal, Noble Group Ltd., the largest independent commodity trader in Asia, continued to be in serious financial trouble. In June of 2017, Noble arranged for a 120-day repayment extension on a loan facility.²⁷⁶ Many derivative traders

272. See, e.g., Biggins & Scott, *supra* note 267, at 17-20.

273. See, e.g., INT'L SWAPS & DERIVATIVES ASS'N, THE ISDA CREDIT DERIVATIVES DETERMINATIONS COMMITTEES 5, ¶3.1 (Noting that "[b]efore the establishment of the DCs in 2009, the CDS markets managed Credit Event settlement using physical settlement, cash settlement and eventually voluntary auction protocols. (a) To facilitate central clearing and to address concerns regarding increasing operational complexity and economic risks associated with bilateral dispute resolution and traditional cash or physical settlement, market participants and ISDA began to develop a third type of settlement for CDS contracts – Auction Settlement.").

274. See INT'L SWAPS & DERIVATIVES ASS'N, *Determinations Committee Decision: Has a Restructuring Credit Event occurred with respect to Noble Group Limited?* 2 (Jun. 22, 2017), <https://www.cdsdeterminationscommittees.org/documents/2017/06/aej-decision-06222017-noble-group-limited.pdf> [<https://perma.cc/WEC8-D5L9>] (Timeline for determination extended); INT'L SWAPS & DERIVATIVES ASS'N, *Has a Restructuring Credit Event occurred with respect to Noble Group Limited?* (Aug. 9, 2017), <https://www.cdsdeterminationscommittees.org/documents/2017/08/dc-decision-08092017-noble-group-limited.pdf> [<https://perma.cc/8V8E-ANTA>] (dismissal); INT'L SWAPS & DERIVATIVES ASS'N, *Asia-Ex Japan Determinations Committee Statement* (Aug. 10, 2017), <https://www.cdsdeterminationscommittees.org/documents/2017/08/aej-dc-statement-08102017-noble.pdf> [<https://perma.cc/J7PS-VYAA>] ("[T]he dismissal of a [Determinations Committee] Question will not constitute a [Determinations Committee] Resolution with respect to whether or not the matter referenced in such DC Question"); *but see* Scott O'Malia, ISDA Chief Executive Officer, *Some Thoughts on Noble* (Aug. 30, 2017), <https://www.isda.org/2017/08/30/some-thoughts-on-noble/> [<https://perma.cc/3XSD-HP5W>] ("[T]he [Determinations Committee] felt it did not have sufficient information to determine the [Determinations Committee] question one way or the other, because it was not able to get hold of the underlying loan documentation and details of the guarantee.").

275. See INT'L SWAPS & DERIVATIVES ASS'N, *Asia-Ex Japan Determinations Committee Statement* (Aug. 30, 2017), at <https://www.cdsdeterminationscommittees.org/documents/2017/08/noble-aej-dc-statement-30082017.pdf> [<https://perma.cc/2W2Z-952V>] ("The [Determinations Committee] met on 29 August 2017 and again on 30 August 2017 to consider the New Noble [Determinations Committee] Questions and the DC Resolved that the Settlement Suspension provisions of Section 10.1 of the 2014 Definitions and Section 6.5 of the Updated 2003 Definitions currently apply pending Resolution by the DC of the New Noble DC Questions."); *see also* Robert Smith, *ISDA freezes attempts to settle Noble CDS*, FIN. TIMES (Aug. 30, 2017), <https://www.ft.com/content/80378f9a-0ad4-3dc0-9deb-ac6bf50130f7> [<https://perma.cc/K39N-TF74>] ("The International Swaps and Derivatives Association (ISDA) committee tasked with making a ruling on the tussle over Noble Group's credit-default swaps has suspended any attempts to settle the derivatives contracts bilaterally.").

276. See, e.g., Finbarr Bermingham, *Struggling Noble Group secures debt extension relief*, GLOBAL

interpreted the 120-day extension as a potential default by Noble, which should have immediately triggered approximately \$160 million in payments on various CDS protection contracts.²⁷⁷ JP Morgan Chase & Company and BNP Paribas SA, among others, asked the ISDA Determinations Committee to consider whether a credit event has occurred with regard to Noble.²⁷⁸

The ISDA Determinations Committee's repeated refusal to make a determination-decision and the subsequent suspension of any payouts on Noble's debt created a new level of uncertainty in CDS markets. This uncertainty drew into question many of the reforms in derivative markets that followed the Great Recession.

As of the writing of this article, the ISDA Determinations Committee has decided, that Noble is in default.²⁷⁹ However, without a consistent and transparent settlement framework, uncertainty in CDS markets may continue and once again raise prospects of drawn out litigation. The failure of the Determinations Committee may further reintroduce the very operational and economic risk it was meant to address and push an even higher number of derivative transactions into central clearing.

This is because CCPs generally have broader discretion and more flexibility to declare default when compared to the ISDA Determinations Committee or bilateral trades. As an intermediary between counterparties, CCPs are able to offset losing positions much more quickly and significantly reduce the potential of drawn out legal challenges. This advantage may increase the volume of centrally cleared CDS contracts to a much larger extent than seen before and particularly if uncertainty in bilateral markets returns to pre-2009 levels due to ineffective default determinations.

Declarations or the lack of declarations of default by the ISDA Determinations Committee may also conflict with default determinations made by CCPs at the same time. For example, CDS contracts written on the same reference entity, such as those by Noble Group Ltd, may be available as bilateral and centrally cleared contracts. What impact will determinations of the ISDA Committee have on the declaration of default by a CCP?

TRADE REVIEW (Jun. 20, 2017), <https://www.gtreview.com/news/asia/struggling-trader-noble-secures-debt-extension-relief/> [<https://perma.cc/E3UC-LCUT>].

277. See, e.g., Anjani Trivedi, *Another Noble Mess – This Time, It's Derivatives*, WALL ST. J. (Aug. 29, 2017), <https://www.wsj.com/articles/another-noble-mess-this-time-its-derivatives-1504000314> [<https://perma.cc/Z86G-4J88>]; see also Smith & Shepard, *supra* note 229.

278. See, e.g., Smith & Shepard, *supra* note 270.

279. See, e.g., INT'L SWAPS & DERIVATIVES ASS'N, *Asia-Ex Japan Determinations Committee Statement* (Sept. 19, 2017), <https://www.cdsdeterminationscommittees.org/documents/2017/09/aej-de-statement-09192017-noble-limited-group.pdf> [perma.cc/9CH4-A3TK] (decision that default may be triggered, but only if supported by proper documentation).

D. Non-Default Factors

In addition to some of the explicit default factors mentioned, there are also many non-default factors that may have the potential to significantly impact the risk of default for many CCPs or their clearing members. While non-default factors are not the focus of this article, it may be helpful to provide at least a few examples of some of these factors.

Investment losses, operational risk events, legal and regulatory risks, the failure of a custodian, or the failure of a settlement platform may be some of the most obvious examples for non-default losses.²⁸⁰ At the same time, our current global political climate, which is at least partially responsible for the Brexit vote in the UK,²⁸¹ may be an even more consequential non-default event.

Other examples of non-default factors are international sanctions²⁸² and

280. See, e.g., Carla Stamegna, *Recovery and resolution of central counterparties (CCPs)*, EUR. PARLIAMENTARY RESEARCH SERV. (EPRS) 3 (Mar. 29, 2017), http://www.europarl.europa.eu/RegData/etudes/BRIE/2017/599345/EPRS_BRI%282017%29599345_EN.pdf, [<https://perma.cc/T848-HM5V>] (noting that “CCPs may also incur losses that depend on other factors (‘non-default losses’), such as investment losses operational risk events, legal risks, or failure of a custodian [...] or settlement platform.”).

281. See, Brian Caplen, *May’s bad Brexit for banks*, THEBANKER (July 24, 2018), <http://www.thebanker.com/Editor-s-Blog/May-s-bad-Brexit-for-banks> [<https://perma.cc/9JZ2-U337>] (noting that the financial sector contributes 12% of the UK’s GDP and that “the pleas of the banking sector have fallen on deaf ears and [that] there will be a cost in terms of lost jobs and investment.”); Helen Bartholomew, *Brexit threatens some swaptions trades*, RISK.NET (July 11, 2018), <https://www.risk.net/derivatives/5764651/brexit-threatens-some-swaptions-trades> [<https://perma.cc/J4W8-WYY9>] (arguing that many swaptions may stop working after the UK leaves the EU without a deal on cross-border financial services.); Martin Arnold, *JPMorgan issues bleak warning on Brexit damage*, FIN. TIMES, (July 10, 2018), <https://www.ft.com/content/af41135c-8436-11e8-96dd-fa565ec55929> [<https://perma.cc/4HH7-TMJC>] (Jamie Dimon, JPMorgan Chase’s chief executive, is quoted as saying “We still do not fully understand what Brexit is, its economic effects and how its effects will play out: these are huge question marks that will stay for a long time.”); see also INT’L SWAPS & DERIVATIVES ASS’N, *Brexit – CCP Location and Legal Uncertainty* (Aug. 2017), <https://www.isda.org/a/U8iDE/brexit-paper-1-final1.pdf> [<https://perma.cc/5PFA-SKT9>]; Benoît Cœuré, Speech at the Global Financial Markets Association: European CCPs after Brexit, (June 20, 2017), <https://www.ecb.europa.eu/press/key/date/2017/html/ecb.sp170620.en.html> [<https://perma.cc/B2AH-K34C>]; Karel Lannoo, *Derivatives Clearing and Brexit: A comment on the proposed EMIR revisions*, EUROPEAN CAPITAL MARKETS INSTITUTE POLICY BRIEF No. 25, 9-10 (Nov. 2017), https://www.ceps.eu/system/files/ECMI_PB25_KL_BrexitClearing.pdf [<https://perma.cc/ZBC3-BACT>]; Volker Brühl, *Clearing of Euro Derivatives Post Brexit – An Analysis of Present Cost Estimates*, 9-12 (Center For Financial Studies Goethe University Frankfurt, Working Paper Series No. 588, 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3098932 [<https://perma.cc/FLL5-2H2A>] (arguing that “[d]ue to the strategic importance of OTC derivatives clearing in terms of avoiding systemic risks, the costs associated with a relocation appear negligible, especially since they are likely to be temporary.”); Clarus Financial Technology, *Moving Euro Clearing out of the UK: The 77bn Problem?* (Sept. 28 2016), <https://www.clarusft.com/moving-euro-clearing-out-of-the-uk-the-77bn-problem/> [<https://perma.cc/56U7-UQH3>] (arguing that Brexit may result in a significant Initial Margin increase of nearly 50%).

282. See, e.g., Neil Hume, Guy Chazan, & Harriet Agnew, *Europe in diplomatic push to ease Russia sanctions*, FIN. TIMES, (Apr. 20, 2018), <https://www.ft.com/content/9b9bbd3c-44a5-11e8-93cf-67ac3a6482fd> [<https://perma.cc/A6U2-AXCN>] (noting that Russian sanctions have led to a 30% price

most recently the trade tariffs imposed by the United States against China, Canada, and the European Union.²⁸³ Many of these protectionist actions may not only result in an increase of regulatory arbitrage, but also the overall erosion of global cooperation in financial markets, which is of particular consequence for CCPs.²⁸⁴

Interestingly enough, the uncertainties in global financial markets may also explain the overall growing volume of cleared products.²⁸⁵ In 2018, the volume of most cleared major OTC derivative products has significantly increased when compared to 2017.²⁸⁶ Without any significant changes in market share by any of the CCPs, the volume growth in 2018 was primarily captured by the CCPs with the largest share in their respective product classes.²⁸⁷ As a result, it seems fair to argue that because of some of the non-default factors, the largest CCPs may become even bigger and more systemically important than they already are. This, of course, may also increase the cascade effect when one of these CCPs fails.

Finally, the switch from the scandal-ridden London Interbank Offered Rate (LIBOR) to other benchmarks such as the Secured Overnight Financing Rate (SOFR) in the U.S.,²⁸⁸ the Sterling Overnight Index

jump in aluminum impacting key EU industries from cars to aerospace).

283. See, e.g., David Weigel, *Farmers who propelled Trump to presidency fear becoming pawns in trade war*, WASH. POST (Apr. 8, 2018), https://www.washingtonpost.com/powerpost/farmers-who-propelled-trump-to-presidency-fear-becoming-pawns-in-trade-war/2018/04/08/2d110a50-398f-11e8-9c0a-85d477d9a226_story.html [<https://perma.cc/3LNK-JRYS>] (reporting of the volatility of the soybean market in the U.S. and its impact on farmers); see also Ed Crooks, *US businesses react with alarm to Trump's China tariffs*, FIN. TIMES (Mar. 22, 2018), <https://www.ft.com/content/8f825846-2dfb-11e8-a34a-7e7563b0b0f4> [<https://perma.cc/EDW9-9F94>] (noting that tariffs will cause harm to US workers, businesses, and economic growth); Ana Swanson, *I.M.F. Sees Global Risk in Trump Trade Threats*, N.Y. TIMES (Apr. 17, 2018), <https://www.nytimes.com/2018/04/17/us/politics/imf-global-economy-interest-rates-inflation.html> [<https://perma.cc/W5Z5-JRGZ>] (reporting that trade wars could dampen business investment and spark a sell-off in stock markets).

284. See J. Christopher Giancarlo, *An EU Plan to Invade U.S. Markets: In response to Brexit, Brussels looks to expand its reach*, WALL ST. J. (Nov. 5, 2017) <https://www.wsj.com/articles/an-eu-plan-to-invade-u-s-markets-1509907579> [<https://perma.cc/755F-B9PS>] (arguing that overlapping and uncoordinated regulation in the EU and the US would be disruptive, expensive and detrimental to the U.S. trading markets and economy); see also Chris Davis & Narayanan Somasundaram, *Trade war threatens Koreans autocall losses*, RISK.NET (July 18, 2018) <https://www.risk.net/derivatives/5784461/trade-war-threatens-korea-autocall-losses> [<https://perma.cc/FJ9V-SFS9>] (reporting that since the US-China trade tensions the HSCEI has edged “closer to territory that dealers say could generate hedging losses of as much as 240 million.”).

285. See, e.g., Amir Khwaja, *Swaps data: the big get bigger in cleared swaps*, RISK.NET (July 11, 2018), <https://www.risk.net/comment/5748931/swaps-data-the-big-get-bigger-in-cleared-swaps> [<https://perma.cc/52ZT-9LVQ>] (identifying escalating trade tensions, the continuing uncertainty of European politics and the Federal Reserve’s rate-hike path are as the reasons for the growing activity across most of the big cleared products with the exception of yen interest rate swaps.)

286. *Id.*

287. *Id.*

288. See THE N.Y. FED. RESERVE, STATEMENT REGARDING THE PUBLICATION OF THE OVERNIGHT TREASURY REPO RATES (May 27, 2017),

Average (SONIA)²⁸⁹ in the UK or the Euro Short-term Rate (Ester) in the EU²⁹⁰ may also create significant non-default operational risks for CCPs in the future.²⁹¹

https://www.newyorkfed.org/markets/opolicy/operating_policy_170524a [https://perma.cc/22NN-CDVC] (describing three different benchmark rates: (1) the Narrow general collateral repo rate, (2) the Broad general collateral repo rate, and (3) the Broad Treasury financing rate); *see also* Alternative Reference Committee (ARRC), *Minutes for the June 22, 2017 Meeting*, <https://www.newyorkfed.org/medialibrary/microsites/arrc/files/2017/ARRC-Minutes-Jun-22-2017.pdf> [https://perma.cc/U2AB-M5X2]; Press Release, Alternative Reference Committee (ARRC), Broad Repo Rate Announcement (June 22, 2017), <https://www.newyorkfed.org/medialibrary/microsites/arrc/files/2017/ARRC-press-release-Jun-22-2017.pdf> [https://perma.cc/2UNV-CBRB] (announcing the broad treasury financing rate as the preferred alternative to Libor USD); Lukas Becker, *First SOFR swaps trade as banks test new benchmark*, RISK.NET (July 17, 2018), <https://www.risk.net/derivatives/5781681/first-sofr-swaps-traded> [https://perma.cc/RAL4-KNAV] (noting that “[t]he trading and clearing of the first SOFR swaps represent the next stage in the evolution of the fledging SOFR market.”); Bruce Klein, *Goodbye Libor, Hello SOFR*, FORBES COMMUNITY VOICE (Apr. 19, 2018), <https://www.forbes.com/sites/forbesnycouncil/2018/04/19/goodbye-libor-hello-sofr/#676cf841717d> [https://perma.cc/5NY4-2JGE] (noting that the transfer will be a challenge, but also more transparent and less open to manipulation due to the fact that SOFR is based on “real” transactions and actual overnight repo trades compared to the subjective estimates provided by bankers under Libor); Barry Mills, *From Libor to SOFR*, ABA BANKING J. (Feb. 21, 2018), <https://bankingjournal.aba.com/2018/02/from-libor-to-sofr/> [https://perma.cc/LJY4-TZCU] (describing the background of Libor and how SOFR is intended to function as an alternative benchmark if and when the publication of the Libor ends); Karen Bretell, *What is SOFR? The new U.S. Libor alternative*, REUTERS, (Apr. 3, 2018), <https://www.reuters.com/article/us-usa-bonds-sofr-explainer/what-is-sofr-the-new-u-s-libor-alternative-idUSKCN1HA0H1> [https://perma.cc/5DM5-FPE3] (noting that initially SOFR is intended to work alongside Libor and to eventually decrease the need to rely on Libor).

289. *See, e.g.*, Phillip Stafford, *Life after Libor: BoE takes on Sonia benchmark oversight*, FIN. TIMES (Apr. 23, 2018), <https://www.ft.com/content/58cf7234-46dd-11e8-8ae9-4b5ddcca99b3> [https://perma.cc/9EGL-JHBD] (Dave Ramsden, Deputy Governor for Markets and Banking at the BoE is quoted as saying that the “implementation of the reforms to Sonia is an important milestone in the Bank’s delivery of improvements to the resilience and effectiveness of financial markets. The reforms improve the sustainability and representativeness of this key piece of the sterling market infrastructure.”).

290. *See e.g.*, Press Release, European Central Bank, Decisions Taken by The Governing Council of the ECB (in addition to decisions setting interest rates) (May 16, 2018), <https://www.ecb.europa.eu/press/govdec/otherdec/2018/html/ecb.gc180518.en.html> [https://perma.cc/T7SN-QJZU] (Ester will be produced in 2020, complement existing benchmark rates produced by the private sector and serve as a backstop reference rate); Press Release, European Central Bank, ECB announces methodology for calculating Euro Short Term Rate (ESTER) (June 28, 2018), <https://www.ecb.europa.eu/press/pr/date/2018/html/ecb.pr180628.en.html> [https://perma.cc/4K9U-PY93] (announcing the first release in summer of 2018); EUROPEAN CENT. BANK, ESTER METHODOLOGY AND POLICIES (June 28, 2018), https://www.ecb.europa.eu/paym/initiatives/interest_rate_benchmarks/shared/pdf/ecb.ESTER_methodology_and_policies.en.pdf [https://perma.cc/WE7J-4VZQ] (defining ESTER, data and publication standards).

291. *See, e.g.*, Robert Mackenzie Smith, *Pimco criticizes, LCH over SOFR plan*, RISK.NET (July 16, 2018), <https://www.risk.net/derivatives/5769311/pimco-criticises-lch-over-sofr-plan> [https://perma.cc/3TQ2-L65H] (citing William De Leon, global head of portfolio risk management at Pimco, as noting that “[w]hereas CME has declared that it’s going to use SOFR, I think it is important that LCH [also] uses SOFR and not Fed funds, otherwise it’s going to wind up with a contract that is sort of a bastard contract. I think that’s an important thing to consider, and as a best practice, we should encourage new contracts not to be in between.”); *see also* Nazneen Sherif, *Libor switch calls for modeling overhaul, quants warn*, RISK.NET (July 5, 2018), <https://www.risk.net/derivatives/5748776/libor-switch->

VI. IMPLICATIONS FOR THE FUTURE

CCPs have proven resilient during the Great Recession.²⁹² However, since then, their systemic importance has significantly increased. The broadly adopted mandatory clearing mandate has resulted in a redistribution and concentration of counterparty risk from banks and other systemically important financial institutions to CCPs. To address this increased systemic risk of CCPs, national regulators have implemented many prudential requirements. What is missing, however, are meaningful global rules to address the cascade effect that may result from the complete failure of any major interconnected CCP reaching across borders.²⁹³

While the ability to reduce counterparty risk through mutualization of member losses and the use of default waterfalls are critical safeguards in financial markets, it may be the ability of CCPs to maintain long-term viability during events of financial distress - and, in particular after some of the CCPs' internal resources have been exhausted - that will prove most essential in preventing catastrophic cascade effects. This is to say that while a CCP may face market risks when one of its clearing members fails, if the defaulting member complied with the rules of the clearinghouse and if all of the member's collateral and default fund contributions are available to the CCP, this should not have any impact on the capital or the viability of the CCP.

Instead, the greatest systemic risk of any major interconnected CCP

calls-for-modelling-overhaul-quants-warn [<https://perma.cc/V39Z-2ZYW>] (noting that the uncertainty of the transition to new benchmarks will impact risk modeling and that the transition may end in a "last minute panic"). Another potential risk for CCPs is the possibility that they may have to comply with the EU Benchmark Regulation and be considered benchmark administrators. See, e.g., Lukas Becker, *Eonia woes hold up euro swaptions switch*, RISK.NET (July 9, 2018), <https://www.risk.net/derivatives/5758231/eonia-woes-hold-up-euro-swaptions-switch> [<https://perma.cc/77W6-7NX7>]; see also J. Christopher Giancarlo, Opening Statement before the Market Risk Advisory Committee (July 12, 2018), <https://www.cftc.gov/PressRoom/SpeechesTestimony/giancarlostatement071218> [<https://perma.cc/S73L-CC4V>] (arguing that "[t]he transition from LIBOR to SOFR and the other risk-free rates requires thoughtfulness and preparation in order to support and not jeopardize financial stability).

292. See, e.g., Randall Kroszner, *Making Markets More Robust* 23-24 (Apr. 30, 2009) (revised draft prepared for the Alvin Hansen Symposium), <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.603.8795&rep=rep1&type=pdf> [<https://perma.cc/2KL5-EZCF>] (arguing that "[c]learinghouses as central counterparties can be an effective way to mitigate the potential problem 'too interconnected to fail'," whereas I argue in this article that the level of interconnectedness between clearinghouses and its members may in fact have the opposite effect.); see also NORMAN, *supra* note 58, at 34.

293. See, e.g., Manmohan Singh & Dermot Turing, *Central Counterparties Resolution – An Unresolved Problem* 4 (IMF Working Paper WP/18/65, Mar. 2018), <https://www.imf.org/~media/Files/Publications/WP/2018/wp1865.ashx> [<https://perma.cc/AJ3F-UADA>].

may result from wrong-way risk or extreme tail events overwhelming any internal liquidity facility and triggering a CCP to become insolvent. In other words, what happens if a clearing member fails that also serves as the CCPs only liquidity facility? The CCP may also fail, because the CCP may no longer be able to pay variation margins to members whose positions improved and will also be unable to balance its own books as a result.

If the continuity of CCP services during times of financial distress and without the need for any public bailouts remains the goal, any long-term viability of CCPs that requires the continuity of services must include effective recovery and resolution tools. To be sure, these tools must go beyond any internal default mechanisms, such as margin calls, waterfalls, or auctions.

The following section will discuss some of these proposed CCP recovery and solution tools with a focus on the U.S. This jurisdiction was chosen because of its overall importance and transaction volumes in derivative markets.²⁹⁴

A. Background Information

Ten years after the Great Recession, the concepts and meanings of recovery and resolution of CCPs remain subject to debate.²⁹⁵ While preserving business continuity and the avoidance of taxpayer bailouts seems to be the main objective of CCPs,²⁹⁶ it is unclear how this objective may be accomplished. In particular, it is questionable how business continuity of a CCP may be achieved and cascade events may be prevented if a CCP outright fails and prudential standards proved insufficient.

At the international level, the Financial Stability Board (FSB) may have provided the most comprehensive definition of CCP resolution

294. See, e.g., Bank of International Settlements, *Statistical Release: OTC Derivatives at end-June 2018* (Oct. 31, 2018), https://www.bis.org/publ/otc_hy1810.pdf [<https://perma.cc/48VK-JSRH>].

295. See, e.g., Cox & Steigerwald, *supra* note 11, at 16-18; see also Singh & Turing, *supra* note 293, at 7-9.

296. See, e.g., Financial Stability Board, *Key Attributes of Effective Resolution Regimes for Financial Institutions*, (Oct. 2011), http://www.fsb.org/wp-content/uploads/r_111104cc.pdf?page_moved=1 [<https://perma.cc/48TL-739E>]; Financial Stability Board, *Key Attributes of Effective Resolution Regimes* 2-3 (Oct. 15, 2014), http://www.fsb.org/wp-content/uploads/r_141015.pdf [<https://perma.cc/9J6Q-BX8G>] (The 2014 version and update of the 2011 Key Attributes explicitly notes that “[n]o changes were made to the text of the twelve Key Attributes of October 2011” and that the “twelve Key Attributes remain the umbrella standard for resolution regimes covering financial institutions of all types that could be systemic in failure.” In its Preamble the Key Attributes specifically state that “[a]n effective resolution regime ... should: (i) ensure continuity of systemically important financial services, and payment, clearing and settlement functions.”).

objectives.²⁹⁷ The FSB is an international standard-setting body set up by the G20 in 2009 in direct response to the Great Recession.²⁹⁸ The FSB is specifically tasked to monitor the global financial system and to develop policies that may help avoid any future financial crisis.²⁹⁹ To ensure the consistency of its standard setting,³⁰⁰ the FSB works closely with other international organizations, including the Committee on Payments and Market Infrastructure (CPMI) as well as the International Organization of Securities Commissions (IOSCO), to develop its standards.³⁰¹

In a discussion note published in 2016, the FSB notes “[a]n effective CCP resolution should have as its objectives the pursuit of financial stability and the continuity of critical functions of the CCP in all jurisdictions where it provides systemically important services without exposing taxpayers to risk of loss.”³⁰² The FSB describes at least three different approaches to achieve this objective. Namely, the FSB suggests that authorities try to (1) restore a CCP’s ability to perform its functions as a going concern, (2) provide for the possibility of another entity to continue to perform the functions of the CCP in resolution, or (3) enter into an arrangement which is coupled with the orderly wind-down of the CCP in resolution.³⁰³

But maybe most important, the FSB suggests that the restoration of market and public confidence needs to be part of any CCP resolution

297. See Financial Stability Board, *Key Attributes of Effective Resolution Regimes for Financial Institutions* (Oct. 2014), www.fsb.org/2014/10/r_141015/ [<https://perma.cc/9J6Q-BX8G>].

298. See, e.g., FINANCIAL STABILITY BOARD (FSB), REPORT TO THE G20 LOS CABOS SUMMIT ON STRENGTHENING FSB CAPACITY, RESOURCES AND GOVERNANCE 1-3 (June 12, 2012), http://www.fsb.org/wp-content/uploads/r_120619c.pdf [<https://perma.cc/3L4H-APQ7>].

299. *Id.*

300. See, e.g., FINANCIAL STABILITY BOARD (FSB), CHAIR’S REPORT ON THE IMPLEMENTATION OF THE JOINT WORKPLAN FOR STRENGTHENING THE RESILIENCE, RECOVERY AND RESOLVABILITY OF CENTRAL COUNTERPARTIES (July 5 2017), <https://www.fsb.org/wp-content/uploads/P050717-3.pdf> [<https://perma.cc/26VU-75X4>].

301. See COMM. ON PAYMENTS AND SETTLEMENT SYS. & TECH. COMM. OF THE INT’L ORG. ON SEC. COMM’N, BANK FOR INT’L SETTLEMENTS & INT’L ORG. ON SEC. COMM’N, PRINCIPLES FOR FIN. MKT. INFRASTRUCTURES (*Apr. 2012*) [hereinafter *CPSS-IOSCO Principles April 2012*], <https://www.bis.org/cpmi/publ/d101a.pdf> [<https://perma.cc/X9X2-UKY7>]; COMM. ON PAYMENTS AND MKT. INFRASTRUCTURES & BD. FOR INT’L ORG. OF SEC. COMM’N, BANK OF INT’L SETTLEMENTS & INT’L ORG. ON SEC. COMM’N, RECOVERY OF FINANCIAL MARKET INFRASTRUCTURES (Oct. 2014), <https://www.bis.org/cpmi/publ/d121.pdf> [<https://perma.cc/5GNW-EEB8>]; COMM. ON PAYMENTS AND MKT. INFRASTRUCTURES & BD. OF INT’L ORG. OF SEC. COMM’N, BANK FOR INT’L SETTLEMENTS & INT’L ORG. ON SEC. COMM’N, RESILIENCE OF CENTRAL COUNTERPARTIES (CCPs): FURTHER GUIDANCE ON THE PFMI (July 2017), <https://www.bis.org/cpmi/publ/d163.pdf> [<https://perma.cc/S3NX-ZKFC>]; COMM. ON PAYMENTS AND MKT. INFRASTRUCTURES & BD. OF INT’L ORG. OF SEC. COMM’N, BANK FOR INT’L SETTLEMENTS & INT’L ORG. ON SEC. COMM’N, RECOVERY OF FIN. MKT. INFRASTRUCTURES, (July 2017) <https://www.bis.org/cpmi/publ/d162.pdf> [<https://perma.cc/Z8VL-2S3F>].

302. Financial Stability Board, *Essential Aspects of CCP Resolution Planning*, Discussion Note, ¶ 1.1.1. at 11 (Aug. 16, 2016).

303. *Id.*

while at the same “time minimizing contagion to the CCP’s participants, affiliates or other [Financial Market Infrastructures].”³⁰⁴ As part of this contagion risk (i.e. cascade effects), the FSB also points out that disruptions in links with Financial Market Infrastructures (FMIs), which are part of the interconnectedness of CCPs, need to be avoided if material negative effects on financial stability could result.³⁰⁵ Specific examples are access to securities or cash collateral held by CCPs.³⁰⁶

CCPs are considered some of the most important and essential FMIs, which are defined as multilateral systems or networks between financial institutions used for clearing, settling services, or recording payments, securities, derivatives, or any other financial transaction.³⁰⁷ Cascade effects are generally recognized as an inherent risk of FMIs due to their interdependencies between financial institutions.³⁰⁸

The FSB further clarified its definition of its CCP resolution objective in a 2017 guidance paper³⁰⁹ in which the FSB specifically stressed the risk of cascade effects among CCPs while pointing out the need of avoiding any disruption in the operation of networks between central counterparties and other financial institutions.³¹⁰

While the FSB, guidance of CCP recovery and resolution may be a necessary step towards harmonizing and avoiding cascade effects in financial markets, the biggest challenge may be the implementation of these standards by national authorities. Of particular concern is the availability of adequate financial resources to support the recovery and resolution of CCPs,³¹¹ which is, of course, also directly tied to the question

304. *Id.*

305. *Id.*

306. *Id.*

307. *See, e.g., CPSS-IOSCO Principles April 2012, supra* note 301, at 7 (“FMI is defined as a multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling, or recording payments, securities, derivatives, or other financial transactions”); *see also* FIN. STABILITY BD., IMPROVING FINANCIAL REGULATION: REPORT TO THE G20 (Sept. 25, 2009), http://www.fsb.org/wp-content/uploads/r_090925b.pdf?page_moved=1 [<https://perma.cc/ZL6P-HZ88>].

308. *See, e.g.,* Guido Ferrarini & Paolo Saguato, Regulating Financial Market Infrastructures 7 (ECGI Working Paper Series in Law, Working Paper No. 259/2014, June 2014), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2450095 [<https://perma.cc/K3TG-ZXJC>].

309. FIN. STABILITY BD., GUIDANCE ON CENTRAL COUNTERPARTY RESOLUTION AND RESOLUTION PLANNING: REPORT TO THE G20, ¶1 (July 5, 2017), <http://www.fsb.org/wp-content/uploads/P050717-1.pdf> [<https://perma.cc/7UDG-M5WA>].

310. *Id.* at ¶ 1.2. (Noting that “CCP resolution should seek to: (i) maintain market and public confidence while minimising adverse contagion⁴ to the CCP’s participants or to the wider financial system, including other FMIs; (ii) avoid any disruption in the operation of links between the CCP in resolution and other FMIs where such disruptions would have a material negative effect on financial stability or the functioning of markets.”).

311. *See, e.g.,* Fin. Stability Bd., *Financial Resources to support CCP resolution and the treatment of CCP equity in resolution* 2-3 (Nov. 15, 2018), <http://www.fsb.org/wp-content/uploads/P151118-2.pdf> [<https://perma.cc/EJ3M-N8NA>] (stating that “[a]s part of planning and development of potential

of whether bailouts may be avoided in the future.

This article argues that it may be a misconception that taxpayer bailouts of CCPs can be entirely avoided while maintaining and even increasing incentives for market participants to centrally clear their financial products. Any result of these incentives may only be an increased concentration of risk in the hand of a few systemically important CCPs, which may not only become bigger as a result, but also further extrapolate any potential cascade effects after the failure of just one single CCP due to its size and interconnectedness. As such, it seems improbable that any disruption in network operations or cascade effects may be prevented or minimized without exposing taxpayers to a significant risk of loss at the same time. In fact, one may argue that today, not only are CCPs of systemic importance, but rather that it is the totality of the FMI networks itself that have become systematically relevant.

B. Central Counterparties Are Not Banks

A discussion of CCP recovery and resolution must address the difference between CCPs and banks, as they are not the same.

The role and function of CCPs has been described already,³¹² but it is essential to understand that CCPs may not be viewed through the paradigm of banking regulation or resolution.³¹³ Banks and CCPs are based on different business models and should not be, and are not, regulated in the same way, which is of particular importance with regard to recovery planning of these institutions. Not considering these differences may result in a simple transfer of risk, further increasing the potential of any spillover and cascade effects.

It is indisputable that banks and CCPs both face significant systemic, credit, liquidity, and operational risks.³¹⁴ At the same time, because CCPs and banks have very different business models, revenue sources, and balance sheet structures, their risks are not the same.³¹⁵

resolution strategies including any preferred resolution strategy or strategies, authorities should undertake an assessment of the adequacy of financial resources consistent with the expectations set out in the FSB Guidance.”).

312. *See, e.g.*, Part II.

313. *See, e.g.*, Cox & Steigerwald, *supra* note 11, at 4 (noting that “[a] failure to understand that clearing is about commitment, not asset/liability (maturity) transformation and that CCPs are not banks leads to the application of an inappropriate paradigm for regulating CCPs – one that sees CCPs through the lens of banking regulators and, in particular, capital regulation.”).

314. *Id.*

315. *See, e.g.*, David Hughes & Mark Manning, *CCPs and Banks: Different Risks, Different Regulations*, RESERVE BANK OF AUSTRALIA, Q. BULL. (Reserve Bank of Australia), Dec. 2015, at 68-70, <https://www.rba.gov.au/publications/bulletin/2015/dec/pdf/bu-1215-8.pdf> [<https://perma.cc/5BDC-STRW>] (arguing that banks operate with a fundamentally different purpose and risk profile); *see also* Mark Jozsef Manning & David Hughes, *Central Counterparties and Banks: vive la difference*, J. OF FIN.

To be clear, CCPs replace or substitute the original counterparties to a financial contract and terminate the original counterparties' bilateral contractual relationship.³¹⁶ In that manner, CCPs become “the buyer to every seller and the seller to every buyer” on all trades submitted for clearing.³¹⁷ In that role, CCPs manage the risks related to the contractual performance of the underlying contract by incentivizing clearing members not to default. CCPs do this by requiring clearing members as buyers and sellers to provide adequate collateral, which in turn is meant to guarantee the buyers' and sellers' contract performance.

In fact, clearing may be best understood as an “institutional arrangement that [is] designed to enhance contractual performance.”³¹⁸ Some commentators have also described CCPs as commitment mechanisms³¹⁹ that may play a “unique, quasi-legislative, quasi-regulatory role in establishing rules and procedures, that govern the contract obligations of both clearing members and the CCP.”³²⁰

The definition of a commitment mechanism seems particularly helpful³²¹ to explain the business model of CCPs and how they operate.

MKT. INFRASTRUCTURES, Mar. 2016, at 1-24 (arguing that banks and CCPs affect systemic risk in different ways); Lin, Li & Jay Surti, *Capital Requirements for the Over-the-Counter Derivatives Central Counterparties* 5 (International Monetary Fund, Working Paper No. 13/3, 2013) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2226276 [<https://perma.cc/KZ67-9XH4>] (“While the nature of CCPs' businesses, balance-sheets and revenues are, in general, quite distinct from banks, their businesses generate the same types of financial risks.”).

316. See, e.g., Bank for International Settlements, Basel Committee on Banking Supervision, *Capital requirements for bank exposures to central counterparties* 7 (July 2012), <https://www.bis.org/publ/bcbs227.pdf> [<https://perma.cc/UN92-V4NV>] (defining a “central counterparty (CCP) [as] a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts. A CCP becomes counterparty to trades with market participants through novation, an open offer system, or another legally binding arrangement. For the purposes of the capital framework, a CCP is a financial institution.”); see also Cox & Steigerwald, *supra* note 11, at 2 n.4 (further explaining that it is necessary to “recognize that the bilateral relationship between the members that submit trades for clearing is irrevocably terminated by novation (or an equivalent legal process).”).

317. Cox & Steigerwald, *supra* note 11, at 2 n.4.

318. Ed Nosal & Robert Steigerwald, *What is clearing and why is it important*, THE FED. RES. BANK OF CHICAGO, CHICAGO FED. LETTER, NO. 278, 3 (Sept. 2010), <https://www.fedprint.org/items/fedhle/y2010isepn278.html> [<https://perma.cc/XV6B-57YR>] (Nosal and Steigerwald criticize the Arrow-Debreu model noting that “[i]f ... people cannot commit, then ... contractual performance may be impaired. One can think of clearing, therefore, as a set of institutional arrangements that are designed to enhance contractual performance.”).

319. *Id.*; see also Cox & Steigerwald, *supra* note 11, at 3 n.6.

320. See, e.g., Paul Tucker, Deputy Gov. for Fin. Stability, Bank of Engl., Remarks at the Depository Trust & Clearing Corporation-Centre of Financial Innovation Post Trade Fellowship Launch: Clearinghouses as systemic risk managers (June 1 2011), <https://www.bis.org/review/r110608g.pdf> [<https://perma.cc/U4A9-GYW2>]; Nosal & Steigerwald, *supra* note 318.

321. See Steigerwald & Cox, *supra* note 11, at 3 n.5; Nosal & Steigerwald, *supra* note 318. The use of the term commitment mechanism and the criticism of the Arrow-Debreu benchmark model is not entirely convincing when considering that the obligation to compensate after a “strategic breach” of an existing contractual obligation, that breach may also be understood as an alternative form of performance.

Commitment mechanisms are a way to change incentive structures and are intended to make performance promises more credible. In other words, commitment mechanisms are meant to remove the risk of opportunistic behavior by one counterparty and may be described as a structural arrangement or operational strategy which promotes and sustains the commitment to the originally promised performance of that counterparty.³²²

If viewed as commitment mechanisms, CCPs provide essential market liquidity for financial contracts and manage the default risk of its clearing members. Clearing members must comply with the rules of the CCP and meet their obligations.³²³ For example, if any clearing member, after receiving calls to post additional collateral, fails to do so, it may lose all of their previously posted collateral as well as all of their default fund contributions, which the CCP, in turn, may use to avoid any institutional losses.

The primary purpose of CCPs, therefore, is to manage and control risk. CCPs do not engage in any typical banking business, such as deposit taking, providing investment services, or market making. CCPs also do not issue debt³²⁴ and their balance sheets do not compare to banks because they are not equally leveraged.³²⁵ But maybe most important, while the

In other words, when entering into a contract, counterparties commit to at least one of two things: (1) the commitment to perform under the contract or (2), in case of a breach and actual damages incurred, the commitment to pay compensation or damages. The commitment to compensate the other party for damages may negate the assumption of a lack of commitment for strategic breach, because the performance commitment is the payment of compensation for breach. Based on this critique, it may also be fair to argue that the role of CCPs should be understood to be more focused on risk mitigation, the support of liquidity and operational integrity in financial markets. This is to say that through the mutualization of risk among clearing members, CCPs offer an essential and efficient means of exchange supporting market liquidity and offering the potential mitigation of clearing members' default or breach of contract.

322. The term "commitment mechanism" relates to commitment theory and the concept of commitment, which also relate to the game-theoretic approach to the commitment problem. *See* THOMAS C. SCHELLING, *THE STRATEGY OF CONFLICT* (HARVARD UNIVERSITY PRESS, 1960); THOMAS C. SCHELLING, *STRATEGIES OF COMMITMENT AND OTHER ESSAYS 1-3* (HARVARD UNIVERSITY PRESS, 2006) (Defining commitment "to mean becoming committed, bound, or obligated to some course of action or inaction or to some constraint on future action. It is relinquishing some options, eliminating some choices, surrendering some control over one's future behavior. And it is doing so deliberately, with a purpose. The purpose is to influence someone else's choice. Commitment does so by affecting that other's expectation of the committed one's behavior."); *see also* Rosabeth Moss Kanter, *Commitment and Social Organization: A Study of Commitment Mechanisms in Utopian Communities*, 33 *AMERICAN SOCIOLOGICAL REVIEW* 499 (Aug. 1968).

323. Steigerwald & Cox, *supra* note 11, at 3.

324. *See, e.g.*, Tucker, *supra* note 320.

325. *See, e.g.*, Hughes & Manning, *supra* note 315, at 70 ("The bulk of the assets held by a CCP are the collateral (margin) and default fund contributions that it receives from participants against cleared positions. [...] A CCP typically maintains no debt and therefore does not operate on a leveraged basis. A bank's balance sheet, by contrast, is typically highly leveraged, comprising a mix of loans and other assets (such as trading assets and liquid assets) backed by a mix of deposit funding, wholesale debt funding

services of even the biggest and most interconnected systemically important banks may be substituted by any other bank, this is not the case for any major interconnected CCP. Due to the short liquidation horizon of most open positions at a CCP, these positions may not be easily transferred to a different CCP and instead trigger an immediate failure of the CCP followed by widespread cascade effects through global financial markets.³²⁶

C. Lack of Recovery and Resolution Procedures

With the objective of business continuity, there is currently no clear recovery or resolution procedure available in the United States that would directly apply to CCPs. In light of the derivative market volume in the United States, this is of great concern.³²⁷ Moreover, the United States is also home to some of the biggest, most systemically important and interconnected CCPs which operate across many borders.³²⁸

The only two potentially available resolution mechanisms in the United States seem ill fitted and do not offer a clear path towards either recovery or restructure of CCPs.³²⁹ Instead, the available mechanisms focus on financial activities of banks and nonbank financial companies, such as insurance companies. But maybe even more important, these mechanisms seem to exclusively consider liquidation and wind down as the only option for covered financial institution and do not offer an option for continuity or recovery.

and equity capital.”).

326. Steigerwald & Cox, *supra* note 11, at 14.

327. See, e.g., *Statistical Release: OTC derivatives statistics at end-June 2018*, Bank for International Settlements 3 (Oct. 31, 2018), https://www.bis.org/publ/otc_hy1810.pdf [<https://perma.cc/B3RR-XN43>] (The notional amounts outstanding were mainly driven by US dollar-denominated contracts, increasing from \$157 trillion at end-2017 to \$193 trillion at end-June 2018.).

328. For a list of CCPs or Derivative Clearing Organizations registered in the United States, see Derivatives Clearing Organization Database, U.S. CFTC, <https://sirt.cftc.gov/sirt/sirt.aspx?Topic=ClearingOrganizations> [<https://perma.cc/GXY6-X786>].

329. See, e.g., Stephen J. Lubben, *Central Counterparties and Orderly Liquidation Authority*, 36 J. ON THE LAW OF INV. & RISK MGMT. PROD., FUTURES & DERIVATIVES L., VOL. 1-10 (Oct. 2016) [hereinafter *CCPs and OLA*], https://www.creditslips.org/files/glfldr_36_9_article-1.pdf [<https://perma.cc/96A9-PFFM>] (“At best, there are currently two mechanisms for resolving a clearinghouse in financial distress: OLA and subchapter IV of chapter 7 of the Bankruptcy Code.”); see also Stephen J. Lubben, *Failure of the Clearinghouse: Dodd-Frank’s Fatal Flaw?* 10 VA. L. & BUS. REV. 127, 152 (2015) (noting that there is a theoretical possibility to define CCPs as commodity brokers under the Commodities Exchange Act); Stephen J. Lubben, *Nationalize the Clearinghouses!*, SETON HALL PUBLIC LAW RESEARCH PAPER NO. 2458506 23 (June 24, 2014), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2458506 [<https://perma.cc/3RHP-NR22>].

1. Orderly Liquidation Authority

The first available option under U.S. law is the so-called Orderly Liquidation Authority (OLA), which is implemented in Title II of the Wall Street Reform and Consumer Protection Act (Dodd-Frank Act).³³⁰ Under OLA, large bank holding companies, systemically important nonbanks, or any company that is predominantly engaged in financial activities may be subject to FDIC receivership.³³¹ FDIC receivership is voluntary or involuntary³³² and may be initiated after a Chapter 11 bankruptcy filing has been found to be inappropriate.³³³

The U.S. Treasury Department may place a “covered financial company”³³⁴ under receivership after a joint recommendation by the FDIC and the FRB, which must be followed by an order of the U.S. District Court of Columbia authorizing the FDIC receivership.³³⁵ Covered financial companies are placed under receivership if the failure of the company under the Bankruptcy Code or other applicable insolvency regimes, such as the Securities Investor Protection Act (SIPA),³³⁶ would trigger serious adverse effects on the financial stability of the United States.³³⁷

Although Title II of the Dodd-Frank Act does not directly mention or define CCPs as covered financial companies, some commentators³³⁸ suggest that CCPs may be covered financial companies because they

330. 12 U.S.C. § 5381 (2011).

331. 12 U.S.C. § 5383(b) (2011).

332. 12 U.S.C. § 5383(a)(1)(A) (2011).

333. 12 U.S.C. § 5383(a)(2)(F), § 5381(a)(2) (2011).

334. 12 U.S.C. § 5381(a)(8) (2011) (“The term “covered financial company”— (A) means a financial company for which a determination has been made under section 5383(b) of this title; and (B) does not include an insured depository institution.”).

335. 12 U.S.C. § 5382 (2011).

336. 15 U.S.C. § 78aaa (2017) (Under SIPA the trustee is required to distribute securities directly to customers and investors to the greatest extent possible to satisfy any claims. This is different to the approach taken by a trustee in a Chapter 7 bankruptcy proceeding. Instead of turning over securities, the trustee must generally turn securities into cash first and satisfy creditors’ claims in cash.)

337. 12 U.S.C. § 5383(b), § 5384(a) (2011) (“It is the purpose of this subchapter to provide the necessary authority to liquidate failing financial companies that pose a significant risk to the financial stability of the United States in a manner that mitigates such risk and minimizes moral hazard.”).

338. See, e.g., *CCPs and OLA*, *supra* note 329, at 2-3; see also JP Morgan Chase & Co. Office of Regulatory Affairs, *What is the Resolution Plan for CCPs?*, PERSPECTIVES (Sept. 2014), <https://www.jpmorganchase.com/corporate/About-JPMC/document/resolution-plan-ccps.pdf> [<https://perma.cc/TF87-X7TS>] (“Absent unusual facts and circumstances, a CCP in the United States is a “financial company” because 85% or more of its revenue is derived from safekeeping, custody, clearance, settlement, extensions of credit and bilateral or multilateral netting services, all of which are not only financial activities but within the business of banking.”); CFTC & FDIC Market Risk Advisory Committee, Staff Presentation of the CFTC and FDIC: DCO Resolution 15 (June 27, 2016), https://www.cftc.gov/sites/default/files/idc/groups/public/@aboutcftc/documents/file/mrac062716_dcor esolution.pdf [<https://perma.cc/79Y2-6WPX>] (“DCOs are likely eligible for resolution under the Orderly Liquidation Authority as ‘financial companies’ under FDIC Regulation 12 CFR § 380.[8].”).

qualify as institutions “predominantly engaged in financial activities.”³³⁹

Under section 201(b) of the Dodd-Frank Act, the FDIC was granted the power to establish standards for determining when a financial institution is predominantly engaged in financial activities.³⁴⁰ In its standards, the FDIC relies on an 85% or greater calculation of the total consolidated revenue of financial institutions.³⁴¹ According to this standard, a financial institution is considered “predominantly engaged” in financial activities if

(1) [a]t least 85 percent of the total consolidated revenues of such company (determined in accordance with applicable accounting standards) for either of its two most recently completed fiscal years were derived, directly or indirectly, from financial activities, or (2) based upon all of the relevant facts and circumstances, the consolidated revenues of the company from financial activities constitute 85% or more of the total consolidated revenues of the company.³⁴²

The definition of “financial activity” under the FDIC standard is equally broad and fails to directly mention clearing activities or include any reference to CCPs.³⁴³ In fact, the only reference to derivatives is mentioned in the context of “investing and trading activities” in which a principal engages in “[f]orward contracts, options, futures, options on futures, swaps, and similar contracts.”³⁴⁴ While a CCP may become a principle of a derivative contract through novation, a CCP is not directly involved in investing and trading activities as a principal.

Therefore, the only applicable standard relating to CCPs may be the activity of “safeguarding money or securities.”³⁴⁵ However, the FDIC does not explicitly define the term “safeguarding money or securities.”³⁴⁶ But, even if this standard would apply and if it could be construed that CCPs are in the business of safeguarding money, it is doubtful that this activity constitutes eighty-five percent or more of total revenue of every major interconnected and systemically important CCP.³⁴⁷ This is because

339. 12 C.F.R. § 380.8 (2013); *see also* Definition of “Predominantly Engaged in Activities That Are Financial in Nature or Incidental Thereto,” 78 Fed. Reg. 34,711 (June 10, 2013) (codified in 12 C.F.R. § 380.8) (The FDIC mentions derivative trades as financial activities multiple times, but does not mention clearinghouses with the exception of a pin cite in footnote 74 or in context of clearing transactions that involve securities.).

340. Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, § 201(b), 124 Stat. 1376 (2010) (codified at 12 U.S.C. §§ 5384).

341. 12 C.F.R. § 380.8 (a)(1)-(2) (2013).

342. 12 C.F.R. § 380.8 (a)(1)-(2) (2013).

343. 12 C.F.R. § 380.8 (b)(3) (2013).

344. 12 C.F.R. § 380.8 (b)(3)(vi)(H)(2) (2013).

345. 12 C.F.R. § 380.8 (b)(3)(i) (2013).

346. A general definition of safeguarding money and securities may be found in 17 C.F.R. § 240.17Ad-12(a)(1)-(2) (2013).

347. *See, e.g.*, Kathleen M. Cronin, CME Group, *Comment Letter to FDIC re: Proposed Rules on*

many of the services needed to safeguard money are not offered by CCPs.³⁴⁸ Instead, CCPs rely on many other financial institutions to provide liquidity, lines of credit, custodianship, settlement services, and cash management.³⁴⁹

Regardless of the difficulties in determining whether OLA applies directly to CCPs, OLA may also be ill suited as a recovery or resolution mechanism for CCPs for at least four reasons.

First, as the primary regulators of CCPs,³⁵⁰ the CFTC and the SEC are not given any role in the decision-making process to put a clearinghouse under receivership.³⁵¹ Both regulators must only be consulted *after* the FDIC has been appointed as receiver.³⁵² The announcement of an FDIC receivership without prior consultation of any of the primary regulators of CCPs may therefore not constitute a comprehensive evaluation of all relevant market risks. Against the background of the objective to continue services, this seems highly problematic and may prove counterintuitive by further increasing the potential of cascade effects.

Second, the concept of a “lift-out” of the viable business of a CCP under OLA also seems to rely on a misconception of how CCPs function

Orderly Liquidation Authority 75 *Fed. Reg.* 64173 (Nov. 18, 2010), <https://www.fdic.gov/regulations/laws/federal/2010/10c22orderliq.pdf> [<https://perma.cc/R6VV-QC5E>] (“CME Inc’s only activities that could possibly qualify as financial in nature, and hence count toward the specific numerical threshold, are its clearing and settlement services. Such services could be construed to entail the ‘safeguarding of money’ – a recognized type of financial activity under section 4(k) of the Bank Holding Company Act (‘BHC Act’) ... Because these clearing and settlement activities do not constitute 85 percent or more of CME Inc’s total revenues, however, CME Inc. cannot be deemed ‘predominantly engaged’ in financial activities. Thus, CME Inc. is not covered by the definition of ‘financial company’ set forth in § 201(a)(11) of Title II.”); *see also* *CCPs and OLA*, *supra* note 329, at 3. (Please note while Lubben comments in fn. 15 that “[p]resumably regulators could require the clearing operations [of CME] to be incorporated into one or more subsidiaries,” he does not provide any further argument or authority on how this could be accomplished. It is unclear which power or legislative mandate regulators could rely on to force CME to restructure its business model. It seems hard to imagine that, without any such express mandate, regulators could force any CCP to restructure and especially if the CCP operate across borders.)

348. *See supra* Part II.B.v.

349. *Id.*

350. Dodd-Frank Wall Street Reform and Consumer Protection Act, P.L. 111-203, Title VIII, 124 Stat. 1376, 1802-1822 (2010) (establishing the new regulatory framework for systemically important utilities); *see also*, U.S. Commodity Futures Trading Commission, *Clearing Organizations, Derivatives Clearing Organizations* (last visited Mar. 21, 2019) <http://www.cftc.gov/IndustryOversight/ClearingOrganizations/index.htm> [<https://perma.cc/H3G2-4ZL7>]; DONNA NORDENBERG & MARC LABONTE, DODD-FRANK ACT TITLE VIII: SUPERVISION OF PAYMENT, CLEARING, AND SETTLEMENT ACTIVITIES, CRS REPORT R41529 13-23 (Dec. 10, 2010), <https://www.llsdc.org/assets/DoddFrankdocs/crs-r41529.pdf> [<https://perma.cc/T9NH-VR4G>] (The CFTC and the SEC are the prudential regulators and primary supervisors for derivatives clearing organizations and clearing agencies, respectively.)

351. 12 U.S.C. § 5383(a)(1)(a) (2011); *see also* *CCPs and OLA*, *supra* note 329, at 5.

352. 12 U.S.C. § 5384(c) (2011) (“The [FDIC], as receiver— (1) shall consult with the primary financial regulatory agency or agencies of the covered financial company and its covered subsidiaries for purposes of ensuring an orderly liquidation of the covered financial company;...”).

in practice. Lift-out is defined as the organization of one or more bridge financial institutions that would assume the liabilities and functions of the failing CCP.³⁵³ However, the failure of a CCP strongly suggests that the clearinghouse relied on incorrect risk modeling.³⁵⁴ As a result, any buyer or bridge CCP would have to immediately have a different risk-model available and the ability to implement it.³⁵⁵ This may create many additional operational challenges, including the calculation of margins or member default fund contributions among the clearing members of the failing CCP.

Moreover, because of the threat of spillover and cascade effects, with every hour and day that a failing CCP or a bridge CCP continues its business based on incorrect risk modeling, the problem may exponentially get worse.³⁵⁶ As some commentators have noted, “[t]his leads to a paradox: if lift-out is unachievable in practice, the policy objective of restoring the critical function of CCPs in resolution seems to oblige the resolution authority to perpetuate a failed risk model.”³⁵⁷

Third, the funding process for liquidation under OLA does not consider a CCP’s short liquidation horizon. Under OLA, the FDIC would be limited by time to issue the total amount of obligations that are available for repayment to counterparties of a failed CCP.³⁵⁸ During the first thirty days following the announcement of receivership, the FDIC may only access the liquidation fund under OLA to distribute up to ten percent of the total consolidated assets of the financial institution under receivership.³⁵⁹ The FDIC must then wait for full access to the fund until after the passing of the first thirty days.³⁶⁰ In addition, even after thirty days, the access to the liquidation fund is limited to ninety percent of the fair value of the total consolidated assets that are available for repayment.³⁶¹ With likely disputes over asset valuation, it is questionable that sufficient funds will be made available in any timely fashion to

353. 12 U.S.C. § 5390(h) (2017).

354. *See, e.g.,* Singh & Turing, *supra* note 293, at 12. (Noting that “[w]hat CCPs do is calculate their potential loss in the event of member default, and call for margin and default fund contributions to cover that loss. If a member default has given rise to losses, which are so large that the margin and default fund were not able to contain them, there was something wrong with the way that the CCP was doing business – its only business. That would, then, suggest that reviving the CCP (which is old, failed, risk model) would be a false decision. Lift-out to a private buyer or to a bridge CCP must overcome this challenge.”).

355. *Id.*

356. *Id.* at 12-13.

357. *Id.* at 12 (the authors argue that variation margin gains haircutting (VMGH) is the least troublesome CCP resolution tool).

358. 12 U.S.C. § 5390 (n)(6) (2017).

359. 12 U.S.C. § 5390 (n)(6)(A) (2017).

360. 12 U.S.C. § 5390(n)(6)(B) (2017).

361. *Id.*

recover a failing CCP.

It is also doubtful that any clearing member or counterparty of a failing CCP may be able to wait for more than thirty days to fully receive adjustments or debits on their margin payments without potentially facing their own risk of default. Equally hard to imagine is that the initial availability of only up to 10% of the total amount of consolidated assets of a failing CCP may be reconciled with the overall objective of continuation of services.

Finally, OLA does not only give federal regulators substantial discretion in whether to place any troubled financial institution under receivership³⁶² and how to implement receivership,³⁶³ under OLA the appointment of the FDIC as receiver may also be subject to court review, which may not be finalized in less than sixty-one days.

If a covered financial institution does not voluntarily consent to the appointment of the FDIC as receiver, the Secretary of the Treasury must seek an order by the U.S. District Court for the District of Columbia authorizing the appointment of the FDIC as receiver.³⁶⁴ The petition for review is filed under seal and the District Court has twenty-four hours to schedule a hearing and make its determination.³⁶⁵ If the court does not make a decision within twenty-four hours, the petition is granted by operation of law and the FDIC is appointed as a receiver.³⁶⁶

In its decision, the court is limited to reviewing whether the Secretary of the Treasury was correct in finding that (1) the financial institution is a covered financial institution in default or in danger of default, and (2) that the institution qualifies as a covered financial company under OLA.³⁶⁷ If the court decides that the determination of the Secretary was incorrect, the court must issue a written and reasoned statement and provide the Secretary with an immediate opportunity to amend and re-file the petition, possibly triggering a second twenty-four hour decision timeframe for the District Court.³⁶⁸

Following the final decision of the District Court, the Secretary and the covered financial company in question also have the opportunity to appeal to the U.S. Court of Appeals for the District of Columbia and may further petition the U.S. Supreme Court for a writ of certiorari following the decision of the Court of Appeals.³⁶⁹ While both, the appeal and the writ

362. 12 U.S.C. § 5386 (a)(1) (2017).

363. 12 U.S.C. §§ 5384 (2011), 5386 (2017), 5390 (2017).

364. 12 U.S.C. § 5382 (2018).

365. 12 U.S.C. § 5382 (a)(1)(A) (2018).

366. 12 U.S.C. § 5382 (a)(1)(A)(v) (2018).

367. 12 U.S.C. § 5382 (a)(1)(A)(iii) (2018).

368. 12 U.S.C. § 5382 (a)(1)(A)(iv)(II) (2018).

369. 12 U.S.C. § 5382(a)(2)(A)-(B) (2018).

for certiorari, must be considered on an expedited basis, the Court of Appeals and the Supreme Court have up to thirty days to make their decision.³⁷⁰

With the uncertainty surrounding the question of whether CCPs are covered financial companies under OLA, it is very likely that the decision to place a failing CCP under FDIC receivership may be challenged in court. It is further possible that a final decision ultimately may have to be settled by the U.S. Supreme Court. Given the different organizational structures of CCPs in the United States, there may even be multiple court challenge to resolve this issue. Considering that time is of the essence for an effective recovery or resolution of a failing CCP, the effectiveness of OLA seems questionable. Similarly, the time restricted access to liquidation funds under OLA³⁷¹ and the potential for a drawn-out court battle over the appropriateness of FDIC receivership also fails to consider the short liquidation horizon for open accounts at CCPs.

Overall, OLA remains controversial today. Proponents argue that OLA currently offers the only existing and workable approach to avoid cascade effects from the failure of systemically important financial institution and preventing the need for public bailouts.³⁷² Critics, on the other hand, argue that OLA may be inappropriate for the wind down of complex financial institutions without threatening financial markets and that policymakers may have too much discretionary power in the resolution of these institutions, which may result in preferential treatment of some institutions and perpetuate market distortions.³⁷³

370. *Id.*

371. 12 U.S.C. § 5390 (n)(6) (2010).

372. See Financial Scholars Oppose Eliminating “Orderly Liquidation Authority” As Crisis-Avoidance Restructuring Backstop, Letter from Jeffrey N. Gordon, Professor of Law, Columbia Law School, and Mark J. Roe, Professor of Law, Harvard Law School to Michael Crapo, Senator and Chairman, Senate Committee on Banking, Housing and Urban Affairs, Sherrod Brown, Senator and Ranking Member, Senate Committee on Banking, Housing and Urban Affairs, Chuck Grassley, Senator and Chairman, Senate Committee on the Judiciary, Dianne Feinstein, Senator and Ranking Member, Senate Committee on the Judiciary, Jeb Hensarling, Congressman and Chairman, House Financial Services Committee, Maxine Waters, Congresswoman and Ranking Member, House Financial Services Committee, Bob Goodlatte, Congressman and Chairman, House Judiciary Committee, John Conyers, Jr., Congressman and Ranking Member, House Judiciary Committee, (May 23, 2017) (the letter was signed by 122 law professors and economists arguing that bankruptcy cannot substitute for resolution via OLA); see also Robert J. Samuelson, *How are we preparing for the next financial panic?*, WASH. POST (June 1, 2017), https://www.washingtonpost.com/opinions/how-are-we-preparing-for-the-next-financial-panic/2017/06/01/a123c2c8-46cb-11e7-98cd-af64b4fe2dfc_story.html [<https://perma.cc/7362-WD3W>] (comprehensively describing the debate for and against the Orderly Liquidation Authority).

373. See *Examining How the Dodd-Frank Act Could Result in More Taxpayer-Funded Bailouts: Hearing before the H. Comm. on Financial Services*, 113th Cong. 2 (2013) (opening remarks of Chairman Hensarling (R-TX)), (“Title II, Section 210, ... clearly creates a taxpayer-funded bailout system); see also Evan Weinberger, *Trump Orders Review of 2 Key Dodd-Frank Act Powers*, LAW360 (Apr. 21, 2017), <http://bit.ly/2GBCSm6> [<https://perma.cc/H5DV-YLYE>]; Raj Gnanarajah & David W. Perkins, *The Orderly Liquidation Authority: Reform Proposals*, CRS INSIGHT REPORT IN10886 (Apr.17, 2018),

Various proposals to reform OLA have been made. The most notable may be the Financial Choice Act³⁷⁴ and the 2018 OLA report by the Treasury Department.³⁷⁵ While the Choice Act wants to entirely abolish OLA,³⁷⁶ the Treasury Report recommends retaining OLA, but reforming it by, among other measures, eliminating the FDIC's authority to treat similar situated creditors differently on an ad hoc basis,³⁷⁷ using private-sector borrowing instead of direct lending from the Treasury Department to fund the Orderly Liquidation Fund ("OLF"),³⁷⁸ limiting the duration of access to OLF loans,³⁷⁹ and reforming judicial review provisions related to the Treasury petition for an order authorizing the appointment of a receiver to resolve a failing financial institution.³⁸⁰

The report by the Treasury Department recognizes that "existing provisions of the bankruptcy code were not designed with the resolution of a large, complex financial corporation in mind,"³⁸¹ but neither the report by the Treasury Department nor the Choice Act considers whether OLA applies to CCPs, or whether new recovery and resolution mechanisms would be required to address the threat for financial markets that may result from the failure of a single interconnected and systemically important CCP.

2. Liquidation of Commodity Traders and Other Financial Institutions

The second potentially available recovery and resolution mechanism for CCPs in the United States is Subchapter IV of Chapter 7 of the U.S. Bankruptcy Code.³⁸² Chapter 7 of the U.S. Bankruptcy Code is not a

<https://fas.org/sgp/crs/misc/IN10886.pdf> [<https://perma.cc/R2L6-EN9S>]; Thomas H. Jackson, *Resolving Financial Institutions: A Proposed Bankruptcy Code Alternative*, 2 BANKING PERSPECTIVE (2014), <http://bit.ly/2rQWAac> [<https://perma.cc/MD9D-DELB>] (This notion that Title II is a last-resort option, however, creates a tension between the purposes of bankruptcy law and the announced purposes of a Title II proceeding.); DAVID A. SKEEL, JR., SINGLE POINT OF ENTRY AND THE BANKRUPTCY ALTERNATIVE, IN ACROSS THE GREAT DIVIDE: NEW PERSPECTIVES ON THE FINANCIAL CRISIS (MARTIN NEIL BAILY & JOHN B. TAYLOR EDS. 2019); THOMAS H. JACKSON ET AL., BANKRUPTCY NOT BAILOUT: A SPECIAL CHAPTER 14, MAKING FAILURE FEASIBLE (KENNETH E. SCOTT & JOHN B. TAYLOR, EDS. 2012).

374. H.R. 10, 115th Cong. (2017) (passed House), <https://www.congress.gov/bill/115th-congress/house-bill/10> [<https://perma.cc/JE6P-TFTS>].

375. U.S. DEP'T OF THE TREAS., REPORT TO THE PRESIDENT OF THE UNITED STATES: ORDERLY LIQUIDATION AUTHORITY AND BANKRUPTCY REFORM, (2018) [hereinafter THE TREASURY REPORT], https://dlbjbzgnk95t.cloudfront.net/1014000/1014496/ola_report.pdf [<https://perma.cc/KTX8-XF9Z>].

376. Financial Choice Act, H.R. 10, 115th Cong. § 111 (2017).

377. See THE TREASURY REPORT, *supra* note 327, at 4.

378. *Id.*

379. *Id.* at 6.

380. See *id.* (arguing that judicial review needs to be strengthened while at the same time preserving regulators' ability to act swiftly).

381. *Id.* at 25.

382. 11 U.S.C. §§ 761, 767 (2016).

recovery mechanism that guarantees the continuation of services of any business. Therefore, it may conflict with the generally accepted objective for recovery and resolution of CCPs.

Indeed, Chapter 7 is the resolution mechanism under the U.S. Bankruptcy Code in which a bankruptcy trustee liquidates all of the debtor's nonexempt assets and distributes all of the net proceeds of those assets to creditors.³⁸³ The discharge following a Chapter 7 bankruptcy is the equivalent to a wind down and generally considered a "fresh start,"³⁸⁴ which in itself seems asymmetrical to any form of CCP recovery or continuation of services. Premised on the assumption that creditors, stockholders, employees, and the community at large are better off if a business can be rescued and continue services, Chapter 11 of the U.S. Bankruptcy Code provides for the only meaningful recovery mechanism and the ability to restructure a failing business under the U.S. Bankruptcy Code.³⁸⁵ Chapter 11 also offers the only recovery mechanism under U.S. law that may allow for the temporary or limited continuation of services with the goal of resolution. Liquidation is permitted under Chapter 11 because not every business can be saved.³⁸⁶ A limited continuation of services under Chapter 11 prior to liquidation under Chapter 7 may therefore include the potential benefit of at least tempering any cascade effects.³⁸⁷

While financial institutions, such as banks and other depository institutions are generally not eligible for relief under the U.S. Bankruptcy Code,³⁸⁸ Subchapter IV and V of Chapter 7 make an exception for certain financial institutions, including clearing organizations³⁸⁹ and clearing banks.³⁹⁰ Clearing organizations under Subchapter IV are defined as organizations that are registered according to the Commodity Exchange Act (CEA)³⁹¹ and may include CCPs, which are defined as derivative clearing organizations under the CEA and that have registered with the CFTC.³⁹²

383. *See, e.g.*, CHARLES JORDAN TABB, *THE LAW OF BANKRUPTCY* 87-92 (4th ed. 2016); Please note that Chapter 12 (family farmers and fishermen) and Chapter 13 (individual consumers) of the U.S. Bankruptcy Code offer reorganization procedures, but neither is applicable in the current context.

384. *Id.* at 4.

385. *Id.* at 92-98.

386. *Id.* at 97-98.

387. *Id.* at 1024 ("Reorganization... might offer an opportunity for a viable business to realize a 'going concern' premium over liquidation value.").

388. 11 U.S.C. § 109 (b)(2)-(3) (2012); *see also* TABB, *supra* note 334, at 107-108; MICHAEL SCHILLING, *RESOLUTION AND INSOLVENCY OF BANKS AND FINANCIAL INSTITUTIONS* 6-7 (1st ed. 2016).

389. 11 U.S.C. § 761 (1), (2), (4)(D), (4)(F)(ii), (9)(D), (16).

390. 11 U.S.C. § 781 (3).

391. 11 U.S.C. §§ 761 (1), (2).

392. 7 U.S.C. § 1a (15) (2012). Suffice it to say that there are also CCPs that are registered with the SEC. *See, e.g.*, U.S. Securities and Exchange Commission, *Clearing Agencies*,

However, most surprisingly, the U.S. Bankruptcy Code also categorizes clearing organizations as a subcategory of commodity brokers and seemingly entirely disregards the concept and role of CCPs in financial markets.³⁹³ This has the additional effect that clearing organizations and CCPs are not permitted to seek any relief under Chapter 11,³⁹⁴ further foreclosing any meaningful recovery mechanisms or continuation of services for CCPs under the U.S. Bankruptcy Code. What makes this particularly surprising is the fact that even Lehman Brothers was allowed to file for relief under Chapter 11.³⁹⁵

In sum, under Subchapter IV of the U.S. Bankruptcy Code, CCPs may only be liquidated and resolved. Subchapter IV does not offer any viable recovery option that would allow for a continuation of clearing services to avoid or limit cascade effects.

VII. SOLUTION PROPOSALS

Many different solutions have been proposed to avoid systemic risk in the central clearing context. In this section, some of these solutions will be introduced and discussed, including the suggestion of new forms of clearing based on digital ledgers, blockchain technology, and smart contracts. Other proposals focus on catastrophe or CAT bonds, insurance surcharges, and taxing systemic risk.

A. New Clearing Infrastructures

New financial market and clearing infrastructures are among the solutions proposed to reduce concentration risk and cascade effects triggered by potential CCP failures. Many of the proposed new infrastructures rely on technologies such as digital ledgers, blockchain, or cryptography.³⁹⁶ Many of them are intended to develop better and more

<https://www.sec.gov/tm/clearing-agencies> [<https://perma.cc/JLB8-4YXB>] (last visited Mar. 21, 2019).

393. 11 U.S.C. § 101 (6) (2005) (“The term “commodity broker” means futures commission merchant, foreign futures commission merchant, clearing organization, leverage transaction merchant, or commodity options dealer, as defined in section 761 of this title, with respect to which there is a customer, as defined in section 761 of this title.”).

394. See 11 U.S.C. § 109(d) (enumerating persons and entities that are eligible to be debtors under Chapter 11 and explicitly excluding stock and commodity brokers).

395. In re Lehman Brothers Holdings Inc., No. 08-13555 (Bankr. S.D.N.Y. 2008); see also 4 ANTON R. VALUKAS, REPORT OF THE EXAMINER, In re Lehman Brothers Holdings Inc., No. 08-13555 (Bankr. S.D.N.Y. 2010).

396. See, e.g., International Swaps and Derivatives Association and Linklaters, *Whitepaper: Smart Contracts and Distributed Ledger – A Legal Perspective*, 4 (2017), <https://www.isda.org/a/6EKDE/smart-contracts-and-distributed-ledger-a-legal-perspective.pdf> [<https://perma.cc/LH3Y-SJY9>] (“New technologies allow a fundamental reshaping of derivatives infrastructure, which could reduce operational risks, streamline increasingly cumbersome and time-consuming processes, and cut costs.”).

efficient collateral management solutions.³⁹⁷ Because the companies developing these infrastructures consider themselves primarily as technology providers, they may be labeled as “Fintech companies.” Fintech companies are defined as technology companies that seek to improve and automate both the delivery and use of financial services.³⁹⁸

While an in-depth discussion of Fintech companies and the technology they use is beyond the scope of this article,³⁹⁹ it is important to provide a few examples of Fintech companies and how they may impact CCPs in the future. The three examples discussed here are SynSwap,⁴⁰⁰ Clearable,⁴⁰¹ and Clearmatics.⁴⁰² All three companies aim to “decentralize” central clearing, disrupt the CCP model, and rewrite collateral management rules.⁴⁰³

According to the information provided on the company’s website, “Synswap is a single platform for cleared and non-cleared swaps, designed to streamline the entire post-trade process. Key features include automatic matching, confirmation, collateral management, netting, compression and recordkeeping. Leveraging blockchain technology Synswap fully automates complex events and removes manual interventions from the post-trade workflow.”⁴⁰⁴ Synswap was founded in late 2016 with the goal of replacing the centralized clearing model of

397. See, e.g., International Swaps and Derivatives, *Whitepaper: The Future of Derivatives Processing and Market Infrastructure* 9-14 (Sept. 2016), <https://www.isda.org/a/UEKDE/infrastructure-white-paper.pdf> [<https://perma.cc/XD8G-NA6H>] (“[A]n appropriately designed market infrastructure and processing model can consider how market participants from different sectors interact with infrastructures, and promote solutions that accommodate their needs. For example, in the new environment of mandated clearing, market participants need the ability to efficiently and quickly port positions between clearing members at a CCP.”).

398. See, e.g., *Fintech, Definition*, INVESTOPEDIA, <https://www.investopedia.com/terms/f/fintech.asp> [<https://perma.cc/PW77-XZBZ>] (“Fintech is used to describe new tech that seeks to improve and automate the delivery and use of financial services. At its core, fintech is utilized to help companies, business owners and consumers better manage their financial operations, processes and lives by utilizing specialized software and algorithms that are used on computers and, increasingly, smartphones.”).

399. See, e.g., Philip Stafford, *FT Explainer: The blockchain and financial markets, Clearing and Settlement*, FIN. TIMES (July 14, 2015), <https://www.ft.com/content/454be1c8-2577-11e5-9c4e-a775d2b173ca> [<https://perma.cc/E2DB-7APK>].

400. SYN_SWAP, <https://www.synswap.com/> [<https://perma.cc/GU8X-CF4Z>].

401. CLEARABLE, <http://www.clearable.com/> [<https://perma.cc/8SDY-NAFJ>].

402. CLEARMATICS, <https://www.clearmatics.com/> [<https://perma.cc/T6F4-PWW3>].

403. See, e.g., Bill Hodgson, *New Startup will replace central clearing and rewrite global regulation on margin*, OTC SPACE (Sept. 26, 2016), <https://www.theotcspace.com/2016/09/26/new-startup-will-replace-central-clearing-and-rewrite-global-regulation-margin> [<https://perma.cc/H69J-TGXF>]; see also Joe Parsons, *Blockchain Startup aims to replace clearinghouses*, THE TRADE (Oct. 11, 2016), <https://www.thetradenews.com/blockchain-startup-aims-to-replace-clearing-houses/> [<https://perma.cc/9FXR-U3MD>] (“A new blockchain start-up focused on cleared and uncleared derivatives is aiming to replace the role of clearing houses and win industry-wide support.”).

404. *Streamlined Workflow*, SYN_SWAP, <https://www.synswap.com/> [<https://perma.cc/JYV5-BWTP>] (last visited Mar. 8, 2019).

CCPs through, what the company calls, “distributed clearing solutions.”⁴⁰⁵ The company notes “[d]istributed clearing retains all benefits from central clearing – reduction of counterparty risk exposure, multilateral netting, default management – while removing concentration risk from CCPs.”⁴⁰⁶ At the same time, *Synswap* does not want to be understood as a CCP and argues that because of their peer-to-peer trade execution, novation, and intermediation are no longer required.⁴⁰⁷

The company will initially only focus on interest and credit default swaps, and primarily work in interdealer markets and with buy-side participants.⁴⁰⁸ *Synswap* has not yet gained any regulatory approval, but it has applied for approval in a number of different jurisdictions.⁴⁰⁹

Clearable, the second example, has also not yet gained any regulatory approval. When compared to *Synswap*, *Clearable*⁴¹⁰ is attempting to implement a very similar solution by relying on blockchain technology to disrupt central clearing. At the same time, *Clearable* may view itself more as a clearinghouse as opposed to *Synswap*.⁴¹¹ *Clearable* believes that current CCPs are inefficient, rigid, and overly capital intensive.⁴¹² It also argues that many of the regulatory changes after the Great Recession have forced financial companies out of business, including prime brokers and futures commission merchants.⁴¹³ *Clearable* seems convinced that it can solve this problem and increase market participation by reducing capital requirements for all trading institutions.⁴¹⁴ According to

405. See, e.g., Hodgson, *supra* note 403 (citing one of the co-founders of Synswap); Paul Clark, *The 30-year-old ex-trader trying to bring investment bankers together using Blockchain*, EFINANCIALCAREERS (Apr. 10, 2017), <https://news.efinancialcareers.com/uk-en/280051/the-30-year-old-ex-traders-trying-to-bring-investment-banks-together-using-blockchain> [<https://perma.cc/MB93-694Z>] (“Synswap, will use blockchain technology to automate the OTC derivative clearing process.”).

406. *Distributed Clearing*, SYN_SWAP, <https://www.synswap.com/> [<https://perma.cc/JYV5-BWTP>] (last visited March 8, 2019).

407. See, e.g., Hodgson, *supra* note 403 (transcribing an interview with one of the co-founders of Synswap: “No, there is no central counterparty in our distributed clearing model. Our firm is not a counterparty in any of the trades processed through Synswap ... We should not be considered as a CCP as we are not a clearing house and we are not a counterparty either.”).

408. See, e.g., Parsons, *supra* note 403 (quoting Sophia Grami, co-founder of Synswap as noting that “[f]or now we are focusing on interest rate swaps and credit default swaps, and will further develop the platform for other asset classes”).

409. *Id.* (“[T]he platform is currently in the process of gaining regulatory approval from a number of national financial authorities...” “We do not expect regulators to approve a new clearing method overnight and are aware that this is not a short-term project.”).

410. CLEARABLE, <http://www.clearable.com/> [<https://perma.cc/8SDY-NAFJ>].

411. Jim Falvey, *Presentation Blockchain and Futures Clearing*, FIN(LEGAL)TECH CONFERENCE, CHICAGO KENT-COLLEGE OF LAW (Nov. 4, 2016), Slide 10 (Referring to Clearable as “Real-time OTC derivatives clearing house on blockchain rails ...”) (presentation slides available from the author of this article).

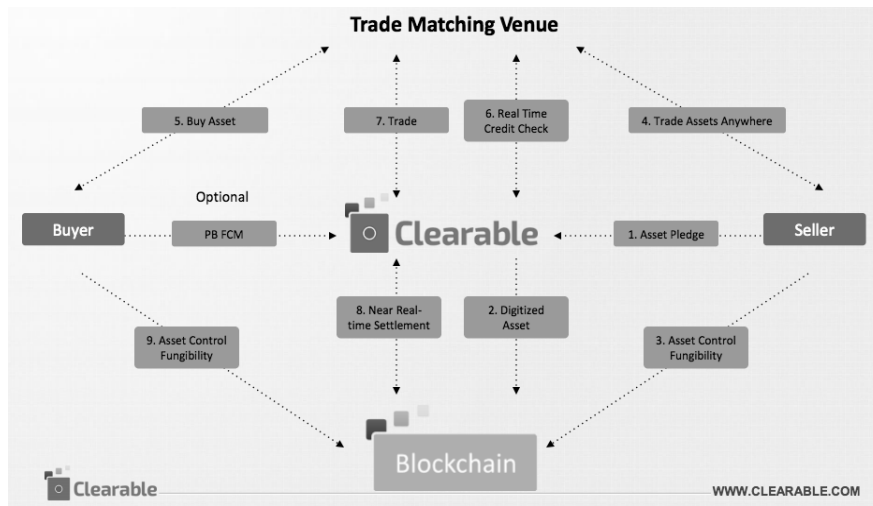
412. *Id.* at slide 8.

413. *Id.* at slide 9.

414. *Id.* at slide 10.

Clearable's Chief Regulatory Officer, Jim Falvey, additional advantages of utilizing blockchain technology are the ability to better customize derivative transactions, settlement and transfer of ownership in real-time, and reducing systemic risk while increasing market liquidity at the same time.⁴¹⁵

*Clearable.com Digitized Trade & Clearing Model*⁴¹⁶



The third example, *Clearmatics*, identifies itself as a blockchain R&D company, which builds “member-owned and governed decentralized network platforms for the peer-to-peer exchange.”⁴¹⁷

With a proclaimed focus on capital markets, *Clearmatics* intends to remove friction and market inefficiencies.⁴¹⁸ The company claims that its technology will encourage self-regulation and, in turn, mitigate and reduce risk.⁴¹⁹ Specifically, *Clearmatics* seems to believe that its technology and platform may be able to remove the need for any financial intermediation and directly “mitigate concentration and liquidity risk, reduce settlement cycles to real time, remove friction, and lower the transaction cost of economic exchange.”⁴²⁰

In similarity to the two previously discussed examples, *Clearmatics* is

415. *Id.*

416. *Id.* at slide 11; see also Clearable, *Our Model*, CLEARABLE www.clearable.com [<https://perma.cc/R8CE-C9A8>] (last visited Mar. 8, 2019).

417. See *Our Mission*, CLEARMATICS www.clearmatics.com/about/ [<https://perma.cc/66VA-JDDE>].

418. *Id.*

419. *Id.*

420. *Id.*

currently also lacking regulatory approval. What seems to distinguish *Clearmatics* from *Synswap* and *Clearable* are the use of different technologies in the blockchain environment and the development of a much broader infrastructure which is not limited to address post-trade inefficiencies.⁴²¹ The overall goal appears to be what the company calls a distributed Financial Market Infrastructure or dFMI. The main advantage of this infrastructure would be its interoperability, allowing for the free movement of value across different blockchains.⁴²²

Information about these different financial infrastructure ventures remains sparse and their functionality is difficult to assess properly. It simply seems too early to tell whether any of the proposed new financial infrastructures will be effective and if intermediation through CCPs can be eliminated through blockchain technology.⁴²³ As of the writing of this article, no regulatory approval has been granted to any of these new infrastructures or platforms. In addition, without intermediation, the advantage of CCPs as the buyer to every seller and the seller to every buyer may also be lost. CCP clearing and novation removes bilateral exposure to the original counterparty, but under any of the described technology platforms this will not be the case and original counterparty risk may remain with the original counterparties, which, in turn, may impact pricing and once again increase interbank exposure and bilateral interconnectedness of market participants. In addition, due to the current lack of regulatory oversight and the limited understanding of regulators on how these technologies work, it seems hard to accurately assess the true risk exposure between counterparties when using these platforms.

It is also questionable how any of these technology platforms facilitating trades do not also function or qualify as a new form of intermediation. It is true that interoperability may address this critique yet doing so in a universal and secure manner without the use of any proprietary nodes seems an unresolved problem. But even if open-source interoperability between technology platforms may ultimately be

421. See, e.g., Christophe MacIntosh, #BUIDL with *Clearmatics: ETHDenver Bounties*, MEDIUM.COM (Feb. 14, 2019), <https://medium.com/clearmatics/buidl-ion-denver-e99cc9c89597> [<https://perma.cc/MD8K-2TLM>] (“We are Clearmatics, a London based startup designing, building and deploying Ethereum-based peer-to-peer platforms for financial market participants to transact seamlessly and securely without unnecessary intermediaries.”).

422. *Id.*; see also Chris Chung, *Ion: The Vision*, MEDIUM.COM (Feb. 4, 2019), <https://medium.com/clearmatics/ion-vision-5fd5d168f9ae> [<https://perma.cc/78G3-KRDN>] (“Interoperability, at its most abstract, is about a compatible and general language for two different systems to communicate with each other.”).

423. See, e.g., Fredrik Ekström, *Blockchain tech for derivatives CCPs – friends or foe?* RISK.NET, (Apr. 13, 2016), <https://www.risk.net/risk-management/2453350/blockchain-tech-derivatives-ccps-friend-or-foe> [<https://perma.cc/P7UD-U7XK>] (“The concepts of [Digital Ledger Technology] – in its fundamental form with decentralized recording of asset ownership – and derivatives CCP clearing are inherently different.”).

achieved, interoperability itself may perhaps become a source of systemic risk and facilitate cascade effects by propagating follow-on systemic events.⁴²⁴

Technology platforms without, or with limited, interoperability appear more similar to vertically integrated CCPs and therefore may be better able to isolate risk in a more efficient manner. In addition, and if necessary, limited interoperability may also allow for faster decision-making and a shorter response time in case of a member default.⁴²⁵ On the other hand, general interoperability between platforms may pose a risk when the result is runnable networks that could become contagion channels for cascade effects.

Finally, the biggest threat to financial stability may come from automated intraday margin calls, which may not be easily executed or stopped if they are excessive and self-executing. For example, the day after the Brexit vote in the U.K. many CCPs simultaneously made margin calls in the combined total of between \$25 billion to \$40 billion, and some of the largest clearing members of these CCPs had to make payments in the multiple billions.⁴²⁶ While ultimately no credit event occurred and all clearing members made their payments, these concurrent margin calls came very close to overwhelming some of the financial institutions involved.⁴²⁷ If margin calls are automated and - based on blockchain technology - are also self-executing, it seems fair to assume that the speed and number of simultaneous large margin calls may increase even further and potentially result in clearing member defaults and cascade effects.⁴²⁸

424. Interoperability is distinguished here from interchangeability of asset classes also known as fungibility. At the same time, it is acknowledged that interoperability of blockchain technologies may perhaps also aid and may even be necessary to provide fungibility in various market sectors.

425. See, e.g., NORMAN, *supra* note 58, at 18-21 (“[A] vertically-structured pairing of exchange and clearing house should be able to take decisions more quickly...”).

426. See, e.g., Peter Madigan, *Huge Brexit Margin Calls Stoke Intra-Day Funding Fears*, RISK.NET, (Oct. 31, 2016), <https://www.risk.net/risk-management/2475620/huge-brexit-margin-calls-stoke-intra-day-funding-fears> [<https://perma.cc/XME3-X7ZV>] (“Estimates of the combined margin call issued by derivatives central counterparties (CCPs) on the day [after the Brexit vote] range from \$25 billion to \$40 billion or more, with their largest members each reckoned to have stumped up multiple billions.”).

427. *Id.* (quoting an unnamed U.S.-based head of one bank’s clearing business as noting that “[e]very clearer made its payments, there were no credit events, but I believe the regulators need to look at the total level of payments that were made and ask themselves whether they are comfortable with a system in which a handful of clearing members is being asked to fund tens of billions during volatile conditions.”).

428. See, e.g., Financial Conduct Authority, *Discussion Paper on Distributed Ledger Technology*, DP17/3, ¶ 3.37, at 19 (2017), <https://www.fca.org.uk/publication/discussion/dp17-03.pdf> [<https://perma.cc/2ZAX-PV47>] (“Firms will ... need to consider carefully if full automation is appropriate.”); Committee on Payments and Market Infrastructures, *Distributed Ledger Technology in Payment, Clearing and Settlement: An Analytical Framework*, Bank of International Settlements 19, 3.4.3 (2017), <https://www.bis.org/cpmi/publ/d157.pdf> [<https://perma.cc/KK99-MVQ8>] (“[I]n a possible future configuration with many automated contract tools, macroeconomic conditions could automatically trigger margin calls across FMIs, leading to severe liquidity demand across the financial system and creating a

Indeed, limits on the automated execution of margin calls could be programmed so that certain margin calls could be denied without management approval. However, doing so may at the same time draw into question the overall utility of automated and self-executing margin calls.

B. Systemic Catastrophe Bonds

Systemic catastrophe, also called CAT bonds, have also been suggested as a possible solution to reduce CCPs systemic risk contributions and cascade effects.⁴²⁹ Primarily used in the insurance industry, CAT bonds were introduced in the early 1990s to hedge against risks of hurricanes, typhoons, tornados, earthquakes, European windstorms, thunderstorms, hail, and even life insurance related risks or health insurance claims.⁴³⁰

Similar to any ordinary bond, a CAT bond is issued by a bond issuer in return for a capital sum or investment.⁴³¹ Typically, the issuers are insurance companies, special purpose vehicles, or any other suitable entity.⁴³² In return for their investment, CAT bond investors receive a coupon rate based on the terms under which the bond begins to experience a loss.⁴³³ The coupon rate may be paid out at regular intervals and for the duration of the bond.⁴³⁴ If a qualifying catastrophe or triggering event occurs, the investor will lose her investment and the issuer will receive the money to cover their losses.⁴³⁵ Cat bonds typically include triggers with clearly defined conditions, which have to be met to establish a payout

systemic event.”).

429. See, e.g., Shane Worner & Jeremy Bray, *Cat Bonds can Help Combat the Systemic Risks of CCPs*, RISK.NET (Aug. 15, 2016), <https://www.risk.net/regulation/2467782/cat-bonds-can-help-combat-the-systemic-risks-of-ccps> [<https://perma.cc/5CAL-PSFX>]; see also Matthew Leising, *Catastrophe Prevention Drives Insurance Pitch to Clearinghouses*, BLOOMBERG (Mar. 11, 2014), <https://www.bloomberg.com/news/articles/2014-03-11/catastrophe-prevention-drives-insurance-pitch-to-clearinghouses> [<https://perma.cc/PNK7-Q9HC>].

430. See, e.g., Thomas Berghman, *Note: A Market Under(writing) the Weather: A Recommendation to Increase Insurer Capacity*, 2013 U. ILL. L. REV. 221, 247-48 (2013) (“The Chicago Board of Trade, following Hurricane Andrew in 1992, first introduced insurance futures and options based on weather”); see also *Catastrophe Bonds: Spreading Risk: Hearing Before the Subcomm. on Oversight and Investigations of the H. Comm. on Fin. Servs.*, 107th Cong. 4 (2002) (statement of Davi D’Agostino), (“When reinsurance prices or availability became problematic in the 1990s, insurers turned to risklinked securities as an alternative means to spread catastrophe risk.”).

431. See, e.g., Thomas Berghman, *supra* note 430, at 250-51.

432. *Id.* at 221.

433. See, e.g., ANTHONY SAUNDERS & MARCIA MILLION CORNETT, *FINANCIAL INSTITUTIONS MANAGEMENT: A RISK MANAGEMENT APPROACH* 165-66 (9th ed. McGraw Hill Education)(2017); Frank J. Fabozzi (ed.), *Handbook of Finance, Financial Markets and Instruments* 390 et seq. (Wiley & Sons)(2008).

434. See, e.g., Saunders & Cornett, *supra* note 433, at 166.

435. See, e.g., Berghman, *supra* note 430, at 224.

event.⁴³⁶

In other words, CAT bonds are “example[s] of insurance securitization to create risk-lined securities which transfer a specific set of risks from the issuer or sponsor to investors.”⁴³⁷ This alternative risk transfer back to capital markets is of interest for CCP recovery. Similar to any default risk transfer from the original counterparties to CCPs, CAT bonds may allow CCPs to transfer the risk of their own default to bond investors in capital markets. CAT bonds may be structured in many different ways and could provide pre-occurrence cover, define a single major loss event, or if aggregated cover is needed, require the exposure to multiple loss events over the period of a predefined risk period.

For CCPs, triggering events could be certain predefined events, including the depletion of a CCP’s internal default funds or the occurrence of a certain type of market stress, including margin or repeated value-at-risk modeling breaches by clearing members. The conditions and parameters defining the triggering events may be negotiated between issuer and investor prior to the issuance of the bonds and coupon rates could be adjusted depending on risk.

The advantage of CAT bonds would be the immediate availability of emergency funds to CCPs if they enter the vicinity of insolvency. The availability of these funds may in turn guarantee the continuation of service and recovery of the CCP without any spillover and cascade effects.

However, even if the proposal of using CAT bonds becomes reality, several open-ended questions would have to be addressed.

First, it is true that CAT bonds are a market-based approach to address the risk of CCP failure and thus may appear to reduce the risk of a public bailout. Yet, because of the risk transfer characteristics of CAT bonds, these bonds may also be viewed as a bailout instrument in and of itself. Regardless of their market-based approach, the availability of CAT bonds alone may reduce a CCP’s incentives to effectively manage risk. As a result, the availability of CAT bonds may create moral hazard rather than eliminating it.⁴³⁸

436. *Id.*

437. Artemis, *What is a Catastrophe Bond (or Cat Bond)?*, <http://www.artemis.bm/library/what-is-a-catastrophe-bond/> [https://perma.cc/2GNM-RW7L].

438. For a different view, see Worner & Bray, *supra* note 429, at 4 (“The use of cat bonds to fund a CCP’s default fund . . . would do so without raising the moral hazard that would necessarily attend a taxpayer-provided bailout or a liquidity backstop by the central bank.”). However, what both authors may not have taken into account is that the amount and level of cat bonds a CCP has access to may give that CCP an incentive to lower margin requirements in order to become more competitive and attract more clearing members. The same may apply to intraday variation margin calls. In sum, the result may very well be a form of clearing arbitrage, potentially triggering a race to the bottom between CCPs and with all related negative effects. In addition, depending on who issued the CCP default cat bonds, that issuer may itself contribute to systemic risk.

While a recent study in insurance markets has concluded that “[CAT] bond issues lead to economically significant decreases in the average issuer’s contribution to systemic risk,”⁴³⁹ the same study also found that “[CAT] bond issues do not significantly affect an insurer’s exposure to externalities spilling over from other financial institutions during times of market turmoil.” The latter may be of greater relevance because of the close interconnected system within which CCPs operate and how they rely on many of their own clearing members to provide additional financial services. But regardless, because the business model of CCPs is very different from insurance companies, a more targeted study is likely necessary. It is also important to remember that CAT bonds are debt instruments⁴⁴⁰ and CCPs are not in the business of issuing debt.⁴⁴¹

Second, it is not only questionable who the issuers of CCP default CAT bonds should be, but also, who the investors may be and what type of assets the proceeds of these bonds may be invested in.⁴⁴² Emergency funds from CAT bonds need to be available immediately upon the occurrence of a triggering event. At the same time, coupon rates also need to be high enough to attract investors.

CCPs are not set up to be CAT bond issuers and may have to rely on other financial institutions or special purpose vehicles to do so for them as a counterparty or sponsor. More importantly, only the most liquid and high-quality assets, i.e. treasury notes, may be appropriate for investment of CAT bond proceeds. However, treasury notes and similar assets typically carry lower interest rates than equities. As a result, if investors, such as pension funds are required to achieve a certain level of returns, they may be prevented from or not interested in investing in CAT bonds if other higher-yielding and equally rated investment options are available in the market.

The group of investors interested in investing in CCP default CAT bonds may be further limited because clearing members of CCPs should not be allowed to invest in these instruments. If permitted to do so, the balance sheets of clearing members may be weakened after the bond is called and if they lose their principal. In turn, this may create yet another extreme tail event, potentially triggering clearing member default and cascade effects.

Finally, even if CAT bonds may be considered an effective tool to

439. Gregor N.F. Weiß, Deneša Bostandzic and Felix Irresberger, *Catastrophe Bonds and Systemic Risk*, 24 (2013), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2313160## [<https://perma.cc/MQ7S-DXWG>].

440. See, e.g., James Chen & Chris Murphy, *Catastrophe Bond – CAT*, INVESTOPEDIA.COM (Apr. 25, 2019), <https://www.investopedia.com/terms/c/catastrophebond.asp> [<https://perma.cc/JP8D-B66Z>].

441. See *supra* note 324 and accompanying text.

442. See, e.g., Worner & Bray, *supra* note 429.

avoid CCP failure and cascade effects, the implementation of rules to regulate these instruments would require a number of legislative changes. It is hard to imagine that in the current political environment in the United States, Congress has the appetite to do so.

C. Systemic Risk Taxes and Systemic Surcharges

A number of scholars have also attempted to address systemic risk with various financial sector tax proposals.⁴⁴³ Some of these proposals focus on corrective taxes, financial transaction taxes, financial activities taxes, or balance sheet levies.⁴⁴⁴ Other proposals suggest individually assessed taxes, which may be based on a financial institutions' systemic risk contributions and are, for example, measured by the purchase price of contingent capital insurance that a specific institution may be required to pay relative to its expected losses during a financial crisis.⁴⁴⁵ A third set of proposals focuses on the failure to impose higher income taxes on banks or to abolish certain tax deductions. The latter proposals attempt to address the dilemma that, in the U.S., banks and other financial institutions have an incentive to finance their operations with debt rather than equity because of the benefit of being able to deduct interest payments, but not dividends.⁴⁴⁶

In sum, most of these proposals intend to limit or reduce excessive risk taking by banks and other financial institutions, and taxes are imposed with the goal of improving the behavior of financial firms. However, none of these proposals seem to have any direct application for CCPs, and they fail to consider how central clearing and its networks contribute to systemic risk in financial markets.⁴⁴⁷

It is true that some of the proposals may be helpful in reducing systemic risk before derivative contracts are cleared and thereby could reduce the overall systemic risk in financial markets; however, this is part of the same function that the central clearing mandate was meant to address and may not arrest the risk of a catastrophic failure of a CCP. To be clear, the systemic risk and cascade effects after the default of a CCP have a

443. See, e.g., Eric D. Chason, *Taxing Systemic Risk*, 16, U.N.H. L. R. 1 (2017); Mark J. Roe & Michael Tröge, *Containing Systemic Risk by Taxing Banks Properly*, 35 YALE J. ON REG. (2018); Viral V. Acharya, Lasse H. Pedersen, Thomas Philippon and Matthew Richardson, *A Tax on Systemic Risk*, SEMANTIC SCHOLAR (Feb. 3, 2010), <https://www.semanticscholar.org/paper/A-Tax-on-Systemic-Risk-Acharya-Pedersen/f30e7ec56461977ec1406cf66fe0fb69408f2059> [<https://perma.cc/Y6P6-RZ2E>].

444. See, e.g., Chason, *supra* note 443, at 1-5.

445. See, e.g., Viral V. Acharya et al., *supra* note 443, Section IV, footnote 8 and accompanying text (advocating for a public-private to tax systemic risk).

446. See, e.g., Roe & Tröge, *supra* note 443, at 193-205 ("The most direct path to capital structure neutrality is to tax debt the way we tax equity, that is, to end the deductibility of interest.").

447. See *supra* Part III.

different cause; it is the result of an overwhelming transfer of risk from financial institutions to CCPs.

While taxing banks and financial transactions for their contribution to systemic risk may be helpful if the tax levies are used to shore up CCPs or fund external default funds, such as the Orderly Liquidations Fund, this would still amount to the equivalent of a public bailout. In addition and with regard to corrective taxes, it seems hard to imagine how a failed CCP may be able to pay any of these taxes. To use the example of one commentator: “If we want less of something - say pollution – we tax it.”⁴⁴⁸ In other words, how do we tax the default of a CCP which resulted from wrong-way risk or an extreme tail event that was previously unrealized? Any corrective tax will be frustrated if the risk producer is unavailable.

Regardless, any financial sector tax would need to be proposed by Congress, and the argument, which was raised above in context of systemic CAT bonds, applies here as well; any meaningful tax reform is unlikely to be signed into law in the near future because there is no political appetite to do so.⁴⁴⁹ Instead, the government and some policymakers currently seem more interested to accommodate financial institutions by eliminating many of the post-crisis safety regulations.⁴⁵⁰

Some scholars have also proposed systemic surcharges as a mechanism to reduce systemic risk in derivative markets and which may be added on to certain derivative contracts.⁴⁵¹ Explored as an alternative to central clearing, these surcharges may reduce the reliance on central clearing.⁴⁵²

The way in which a systemic surcharge would work is by calculating and assessing a specific surcharge based on the effective spread that a protection buyer of a credit default swap (CDS), for example, would be required to pay to a protection seller.⁴⁵³ It is assumed that, because of the surcharge add-on, CDS protection buyers may only pick protection sellers with the smallest effective spread, which in turn may reliably decrease the default risk and systemic risk inherent to a specific derivative transaction.⁴⁵⁴

448. Chason, *supra* note 443, at 23.

449. See, e.g., Edward J. McCaffery & Linda R. Cohen, *Shakedown at Gucci Gulch: The New Logic of Collective Action*, 84 N.C. L. REV. 1159, 1172-73 (2006) (analyzing rent-seeking in and during the tax legislative process).

450. See, e.g., John Heltman, *Big Banks Plead for Capital Relief. D.C. Is Listening*, AM. BANKER (July 11, 2017), <https://www.americanbanker.com/news/big-banks-plead-for-capital-relief-dc-is-listening> [<https://perma.cc/XS4K-MPPN>].

451. See, e.g., Matt v. Leduc, Sebastian Poledna and Stefan Thurner, *Systemic Risk Management in Financial Networks with Credit Default Swaps*, JOURNAL OF NETWORK THEORY IN FINANCE, VOL. 2, NO. 3 (2017), <https://www.risk.net/journal-of-network-theory-in-finance/5343306/systemic-risk-management-in-financial-networks-with-credit-default-swaps> [<https://perma.cc/BP8T-LDPF>].

452. *Id.* at 1-3, 13.

453. *Id.* at 8.

454. *Id.* at 13.

Assessing surcharges in that manner presupposes a regulated derivatives market which is supervised by a well-capitalized agency or perhaps a self-regulatory agency that is able to compute the effects of a CDS contract on systemic risk.⁴⁵⁵ The computation of risk and systemic effect would be made possible by the regulating agency's knowledge of the markets, which may perhaps also require access to a representative data pool of trade repositories.⁴⁵⁶

The agency would regulate markets by incentivizing those CDS contracts that decrease systemic risk and, on the other hand, penalize contracts that increase systemic risk.⁴⁵⁷ Adding or adjusting systemic surcharges to derivative contracts would effectively function as incentives or penalties for counterparties.⁴⁵⁸

Before entering into any specific transaction, a protection buyer may receive quotes of the effective spreads for various protection sellers from the regulating agency.⁴⁵⁹ The agency quotes may include a risk assessment and surcharge calculation, which in turn would incentivize the protection buyers to purchase a CDS from a seller with the smallest effective spread.⁴⁶⁰ If a surcharge is assessed, the charge will be collected by the regulatory agency and may then be paid into a fund, which could then be used to guarantee the fulfillment of CDS contracts in the event of the default of the protection seller or both, the buyer and seller.⁴⁶¹

It is apparent, that the described surcharge proposal is meant to function as an alternative mechanism to central clearing and does not directly address the problem of a CCP failure as discussed herein or the fact that the majority of global jurisdiction has decided in favor of a central clearing mandate. It is also clear that the systemic surcharge proposed may be compared to initial and variation margin requirements at CCPs and that CCPs, as self-regulatory organizations, may effectively regulate centrally cleared derivative markets.⁴⁶²

At the same time, the model of systemic surcharges may provide an additional source of funding for CCPs' internal default funds or operate

455. *Id.* at 10.

456. *Id.* at 13.

457. *Id.*

458. *Id.*

459. *Id.*

460. *Id.*

461. *Id.*

462. *See, e.g.*, Paul Tucker, Deputy Governor for Financial Stability, Bank of Eng., Clearinghouses as Systemic Risk Managers: Remarks at the Depository Trust & Clearing Corporation-Center for Study of Financial Innovation Post Trade Fellowship Launch, (June 1, 2011) (transcript available at <https://www.bis.org/review/r110608g.pdf> [<https://perma.cc/7EES-R58V>]) (CCPs play a "unique, quasi-legislative, quasi-regulatory role in establishing rules and procedures, that govern the contract obligations of both clearing members and the CCP.").

as a market-based liquidity mechanism similar to deposit insurance. In that sense, systemic surcharges are not viewed as an alternative to central clearing, but rather an addition or a secondary market-based mechanism to provide CCPs with additional default funds and short-term liquidity during times of market volatility and stress.

It is fair to assume that with more appropriately funded default funds or the immediate availability of a liquidity backstop to ensure the continuation of services, extreme tail events and CCP failures may be prevented more often than not, and internal default funds may be less likely to be completely depleted. An additional advantage may be the fact that a surcharge may also assess systemic risk contributions more fairly between individual and institutional clearing members of CCPs and their clients.

Before a derivative contract may be cleared by a CCP, the CCP could review and consider previous spread quotes between counterparties or use the median spread value among a class of instruments as a reference entity to assess a systemic surcharge. To avoid regulatory arbitrage, CCPs may perhaps rely on a single source of data, which is collected as part of the CFTC's real-time transaction reporting⁴⁶³ or a trade repository at the National Futures Association (NFA)⁴⁶⁴ that could be similar to the Trade Reporting and Compliance Engine (TRACE)⁴⁶⁵ operated by the Financial Industry Regulatory Agency (FINRA).⁴⁶⁶ Another possibility may be spread data collected by the Depository Trust & Clearing Corporation (DTCC)⁴⁶⁷ and its Global Trade Repository (GTR)⁴⁶⁸ as an international and industry-wide recognized post-trade financial services company.

In addition to default risk, CCPs could also take the true spread risk of counterparties into account when assessing surcharges. As part of the overall credit risk, the true spread risk may represent the likelihood that the value of a derivative contract may also be impacted by certain actions

463. *See, e.g.*, 17 C.F.R. § 17.00 (1976).

464. NATIONAL FUTURES ASSOCIATION (NFA), *About NFA*, <https://www.nfa.futures.org/about/index.html> (last visited on March 2, 2019).

465. FINANCIAL INDUSTRY REGULATORY AGENCY, *Trade Reporting and Compliance Engine (TRACE)*, <http://www.finra.org/industry/trace> [<https://perma.cc/WZG8-7HZZ>]. Please note that TRACE is simply mentioned as an example here. It is acknowledged that the TRACE repository may not be suitable for derivative transactions and focuses on fixed income securities. In December 2007, certain derivative related transactions were also exempt from TRACE reporting because the reported transaction prices were not accurate and FINRA determined that "reporting and dissemination of certain Derivative-Related Transactions does not foster price discovery and may contribute to investor confusion." FINANCIAL INDUSTRY REGULATORY AGENCY, *Regulatory Notice 07-61*, 1-2 (2007), <https://www.finra.org/sites/default/files/NoticeDocument/p037599.pdf> [<https://perma.cc/Z47P-M7SH>].

466. FINANCIAL INDUSTRY REGULATORY AGENCY (FINRA), *About FINRA*, <http://www.finra.org/about> [<https://perma.cc/7LN7-M3MZ>].

467. DEPOSITORY TRUST & CLEARING CORPORATION, *Repository Services*, <http://www.dtcc.com/derivatives-services/global-trade-repository> [<https://perma.cc/82QK-WY79>].

468. *Id.*

or financial mistakes one or both counterparties make. These actions may impact counterparties' credit rating or creditworthiness. Some examples of actions to be considered could be prior manufactured defaults, margin or repeated value-at-risk model breaches, frequent cuts of derivative exposures to reduce loss-absorbency requirements under international standards or compression rates. Based on the evaluation of the true spread risk, CCPs could give their clearing members risk scores indicating creditworthiness and their contribution to systemic risk.

VIII. CONCLUSION

This article has argued that more than a decade after the Great Recession, the United States, as one of the biggest derivative markets by volume, is not prepared to deal with the failure of one single major interconnected CCP. In fact, in September 2018, during the week of the ten-year anniversary of the Lehman's failure, a CCP, Nasdaq Clear AB, came very close to failing, giving rise to these concerns.

At the Pittsburgh Summit in 2009, G20 leaders agreed to a wide-reaching reform to over-the-counter (OTC) derivative markets that underscores the need for a change to the status quo. The requirement that standardized OTC derivatives must be centrally cleared through central counterparties (CCPs) was one of the cornerstones of this reform.⁴⁶⁹ This article builds on this systemic reform mandate and has argued for context-specific additions that could provide additional protections.

Although it was intended to mitigate systemic risk and to eliminate the moral-hazard of too-big-to fail, the central clearing mandate has resulted in a dramatic and one directional transfer of risk. This transfer of risk, almost imperceptibly, has shifted the possibility of loss away from systemically important banks and other financial institutions to CCPs. To make matters worse, because of the increased volume of centrally cleared derivative contracts, CCPs also needed to increasingly rely on their own clearing members to provide financial services that they are not set up to do. The resulting conflict of interest has changed the entire risk profile of CCPs.

Today, a small core of highly connected CCPs and clearing members dominate these networks and concentrate risk at never-before-seen levels. The shock to one central element of the system in which CCPs now operate may likely trigger spillover and cascade effects that could reach far beyond their periphery. As such, the central clearing mandate may have increased the risk of procyclicality in derivative markets.

469. Fernando Cerezetti, Jorge Cruz Lopez, Mark Manning and David Murphy, *Who Pays? Who Gains? Central Counterparty Resource Provisions in the post-Pittsburgh World*, 7 J. OF FIN. MKT. INFRASTRUCTURES 21 (2019).

The latest deregulation attempts in the United States may spell further trouble for CCPs. Industry standardization is lacking behind and financial markets have again started to embrace crisis era products that challenge financial stability, including collateral-debt-obligations (CDOs) and credit-default-swaps (CDSs). New financial products, which are also tied to derivative markets, i.e., exchange traded funds (ETFs), may further challenge the long-term viability of CCPs. For example, ETFs are largely unregulated and hold assets in excess of \$4 trillion globally and are predicted to reach \$6 trillion by 2020. Yet, an even greater challenge may be leveraged loan and direct lending markets, which are growing even faster. Add to this the unscrupulous lending practices by shadow banks and hedge funds aimed at manufacturing defaults in order to trigger CDS payouts and growing global political uncertainties, central counterparties may soon find themselves in a perfect storm in which default may no longer be preventable.

The United States and its financial markets are not ready for the failure of any—or even one—single major interconnected CCP. None of the currently available recovery and resolution procedures in the United States consider the business model of CCPs sufficiently and are unable to arrest any catastrophic spillover and cascade effects triggered by any such failure.

Many different proposals are currently being discussed on how to best address the changed risk profile of CCPs. Some of these proposals suggest that the use of technology, such as digital ledgers and blockchains may replace central clearing and risk concentration. Other proposals focus on the taxation of systemic risk.

Based on the continuing commitment to central clearing across global financial markets, it is doubtful that any decentralized or digitized trade and clearing model will replace CCPs any time soon, but the use of new technologies may greatly enhance the CCP model in the future. Taxes proposed on systemic risk do not seem to hold much promise for CCPs directly, but they may reduce the overall risk in financial markets. The proposed market-based surcharge on systemic risk of cleared derivative contracts and counterparty credit risk is a more feasible option, but it would also require a broad implementation by at least the biggest CCPs.

Arguably, the most advanced proposal is the European Commission's proposal for a regulation on the framework of the recovery and resolution of central counterparties.⁴⁷⁰ While a detailed discussion of this proposal was beyond the scope of this article, the European Commission suggests a much broader, more transparent and comprehensive approach for CCP recovery. This includes more detailed recovery plans, early intervention

470. See *supra* Part I; *supra*, note 3.

rights for regulators, resolution tools, and actions which specifically “should be carried out in a way which [do] not undermine the functioning of the rest of a wider group of which the CCP may form part.”⁴⁷¹

Another recent proposal considers unbundling the functions of a CCP and carrying them out under different operational and organizational frameworks.⁴⁷² More specifically, this proposal advances the idea of “decompos[ing] [CCP] functions into discrete elements and tailor the operational and organizational framework to the particular characteristics of each.”⁴⁷³

All of these proposals are important and need to be pursued, but none of the proposals directly address our current dilemma that the implementation of a central clearing mandate after the Great Recession has created a dichotomy between the goal of risk mitigation and the creation of an entirely new level of systemic risk. The risk profile of CCPs has changed by creating institutions that may be *too-big-to-bail*; therefore, other reforms are needed.

As one commentator in the context of the resolution and recovery of systemically important banks and financial institutions has noted: “The realistic goal is not avoiding bailouts altogether, but finding a predictable legal framework for them that puts as much of the cost as possible on the beneficiaries of the bailout at a time when it will not cause systemic disruption.”⁴⁷⁴ Within this context, new technologies, taxes, surcharges, CCP stress testing, and more effective regulation are potentially cost-effective ways to limit global financial crises.

471. *Id.* at 14, ¶ 4.2.7.

472. Cerezetti et al., *supra* note 469, at 18-20; *see also* Alexander Campbell, *Study Floats Idea of Breaking Up CCP Services*, RISK.NET (Mar. 13, 2019), https://www.risk.net/regulation/6459006/study-floats-idea-of-unbundling-ccp-services-in-new-structure#cxrecs_s [<https://perma.cc/K7BG-4NLP>].

473. Cerezetti et al., *supra* note 469, at 21.

474. Adam J. Levitin, *Bankruptcy's Lorelei: The Dangerous Allure of Financial Institution Bankruptcy*, 97 N. C. L. REV. 243, 291 (2019); *see also* Roe, *supra* note 7, at 1699-03.