

*Central Clearing of Financial Contracts: Theory and Regulatory Implications*¹

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Abstract: To protect economic stability, post-crisis regulation requires financial institutions to clear and settle most of their derivatives contracts through central counterparties, such as clearinghouses associated with securities exchanges. This Article asks whether regulators should expand the central clearing requirement to non-derivative financial contracts, such as loan agreements. The Article begins by theorizing how and why central clearing can reduce systemic risk. It then examines the theory's regulatory and economic efficiency implications, first for current requirements to centrally clear derivatives contracts and thereafter for deciding whether to extend those requirements to non-derivative contracts. The inquiry has real practical importance because the aggregate monetary exposure on non-derivative financial contracts—and thus the potential systemic risk that could be triggered by that exposure—greatly exceeds that on derivatives contracts. The inquiry also raises fundamental legal questions as to why (and the extent to which) regulators should tell financial institutions how to control risk, and whether to require the mutualization of risk.

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INTRODUCTION

Since the global financial crisis of 2007-09 (the “financial crisis”), an increasing number of countries, including the United States, have been requiring most derivatives contracts to be cleared³ and settled⁴ through central counterparties (CCPs).⁵ CCPs are typically well-capitalized entities,⁶ often associated with derivatives, commodities, or

³ Clearing is “the process of transmitting, reconciling and, in some cases, confirming transfer orders prior to settlement” European Central Bank, Glossary of Terms Related to Payment, Clearing and Settlement Systems, available at <https://www.ecb.europa.eu/pub/pdf/other/glossaryrelatedtopaymentclearingandsettlementsystems.pdf>. It involves identifying the obligations of the parties to the transaction.

⁴ Settlement is “the completion of a transaction or of processing with the aim of discharging participants’ obligations through the transfer of funds and/or securities.” *Id.*

⁵ See *infra* notes 36-37 and accompanying text.

⁶ Rather than having large equity cushions, CCPs are usually indirectly capitalized through the resources of their clearing members. See *infra* notes 160-164 and accompanying text.

other securities exchanges.⁷ The CCP legally substitutes its credit for that of the contracting parties, making the CCP the primary counterparty on both sides of the contract—for example, the buyer to every seller and the seller to every buyer.⁸ The CCP thus ensures the performance of a financial contract even if a contracting party fails,⁹ thereby reducing counterparty risk¹⁰—the risk that a contracting party’s default will harm other parties to the contract. Regulators believe this reduction of counterparty risk will reduce “systemic” risk¹¹—the risk that, in this context, a failure of one or more

⁷ The three largest U.S. clearinghouses, for example, are CME Clearing Services, which provides clearing and settlement of exchange trades on the Chicago Mercantile Exchange and the Chicago Board of Trade; ICE Clear U.S., which is owned by Intercontinental Exchange, which owns the New York Stock Exchange; and LCH, which is a unit of the London Stock Exchange Group. See <https://www.reuters.com/article/us-cftc-clearing-tests/three-biggest-u-s-clearing-houses-pass-liquidity-stress-tests-cftc-idUSKBN1CL09Q>; and CME Group, *Clearing Firms*, available at <http://www.cmegroup.com/clearing/financial-and-regulatory-surveillance/clearing-firms.html?redirect=/tools-information/clearing-firms.html>.

⁸ See PETER NORMAN, *THE RISK CONTROLLERS* 7-8 (2011). Cf. Richard Squire, *Clearinghouses as Liquidity Partitioning*, 99 CORNELL L. REV. 857, 862 (2014) (“The clearinghouse interposes itself between the parties, serving as the counterparty to each. Instead of selling the cattle future to Buyer, Seller sells it to the clearinghouse, which sells an identical future to Buyer”); *Derivatives Clearing, Central Counterparties and Novation: The Economic Implications*, EUROPEAN CENTRAL BANK 3 (Mar. 8, 2006), available at https://www.ecb.europa.eu/events/pdf/conferences/ccp/BlissPapathanassiou_final.pdf (observing that the original “bilateral contract between two market participants is replaced by two bilateral contracts between each of the original counterparties and the CCP”). The substitution of credit is legally referred to as a “novation,” which arises when a new party assumes a payment obligation that was incurred by a debtor on a contract and the original debtor is totally released from the obligation. 66 C.J.S. *Novation* § 1 (2018).

⁹ NORMAN, *supra* note 8, at 7.

¹⁰ *Id.* at 9. Central clearing more technically reduces counterparty credit risk, a type of counterparty risk that is sometimes called default risk.

¹¹ The reduction of counterparty risk might reduce, but it cannot eliminate, systemic risk because counterparty failure is not the only cause of systemic risk. Other factors, such as the failure of financial markets, can trigger systemic risk. Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L. J. 193, 200-202 (2008).

counterparties could lead to events that impair the financial system’s ability to function as a network¹² and cause an economic collapse.¹³

This emerging regulatory norm raises the question on which this Article focuses: Should regulators also require other types of financial contracts (hereinafter, “non-derivative financial contracts”) to be centrally cleared and settled, in order to reduce systemic risk?¹⁴ This inquiry has real practical importance because the aggregate counterparty exposure¹⁵ on non-derivative financial contracts—and thus the systemic risk

¹² “Systemic risk” refers generally to the risk that the financial system could fail to function as a network. *Systemic Risk*, *supra* note 11, at 204 & 207-08. The term “macroprudential regulation” refers to regulation designed to mitigate systemic risk. *Cf.* Douglas J. Elliott, Greg Feldberg, & Andreas Lehnert, *The History of Cyclical Macroprudential Policy in the United States*, Fed. Reserve Bd., Finance and Economics Discussion Series No. 2013-29, at 6 (2013) (observing that the goal of macroprudential regulation “is to manage factors that could endanger the financial system as a whole, even if they would not be obvious as serious threats when viewed in the context of any single institution”); Robert Hockett, “Implementing Macroprudential Finance-Oversight Policy: Legal Considerations” 4 (Jan. 20, 2013 draft prepared for the International Monetary Fund; on file with author) (defining the term “macroprudential” as a “prefix [used] in finance-regulatory contexts, pertaining to the reduction of risks that imperil financial systems . . . as wholes”). In contrast, “microprudential” regulation “is concerned primarily with the safety and soundness of individual institutions, markets, or infrastructures.” Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Reserve Sys., “Implementing a Macroprudential Approach to Supervision and Regulation,” Remarks at the Federal Reserve Bank of Chicago’s 47th Annual Conference on Bank Structure and Competition 2 (May 5, 2011), *available at* <http://www.federalreserve.gov/newsevents/speech/bernanke20110505a.pdf>.

¹³ The events that lead to that impairment are not limited to a domino-like collapse of financial institutions but could include changes in behavior of market participants in response to a counterparty’s failure.

¹⁴ I first raised this question at the Federal Reserve Bank of Chicago workshop, “Legal Arrangements for Cross-Border Resolution and Liquidity in OTC Derivative Markets: Theoretical Insights from ‘A Legal Theory of Finance’ and Other Contemporary Perspectives” (June 14, 2014).

¹⁵ Counterparty exposure is the amount of default risk to which a counterparty is subject. *See, e.g.*, <http://www.fincad.com/resources/resource-library/article/counterparty-credit-exposure-swaps> (last accessed Dec. 20, 2017). “Aggregate counterparty exposure” is the aggregate counterparty exposure after netting any offsetting counterparty obligations. The reader should not confuse that concept with the term “net aggregate liability,” which refers to a CCP finding itself liable for an amount that it cannot set off against its clearing members. *See infra* notes 165 & 169 and accompanying text.

that could be triggered by that exposure—greatly exceeds that on derivatives contracts.¹⁶ Centrally clearing derivatives contracts through CCPs also has a “unique feature[]”: the “mutualization of default losses.”¹⁷ Expanding central clearing to non-derivative financial contracts therefore raises fundamental issues about whether regulators should require financial institutions to mutualize,¹⁸ or otherwise specifically control, their risk.

To answer its question, the Article first shows that regulators require central clearing of derivatives contracts because they assume—driven in part by media pressure—that those contracts are inherently systemically risky.¹⁹ The Article then explains why that assumption is misleading: the systemic riskiness of derivatives contracts comes not from their inherent nature but, rather, from their systemically

¹⁶ At year-end 2013, for example, the amount at risk (or “gross market value”) on outstanding bonds alone was \$91 trillion. Securities Industry and Financial Markets Association, 2017 FACT BOOK, 55, available at <https://www.sifma.org/wp-content/uploads/2016/10/US-Fact-Book-2017-SIFMA.pdf>. That amount is many times larger than the \$19 trillion of risk exposure on derivatives. Monetary and Economic Department, Bank for International Settlements, “Statistical release: OTC derivative statistics at end-December 2013” 2, available at https://www.bis.org/publ/otc_hy1405.pdf. Cf. BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM, SUPERVISORY POLICY AND GUIDANCE TOPICS, CREDIT RISK MANAGEMENT 1 (Sep. 6, 2017), available at https://www.federalreserve.gov/supervisionreg/topics/credit_risk.htm (stating that for “most banks, loans are the largest and most obvious source of credit risk. However, there are other sources of credit risk both on and off the balance sheet [including] credit derivatives [and derivatives involving] foreign exchange”). This Article later explains why gross market value, and not “notional amount,” is the proper metric for comparing risk exposure. *See infra* note 104.

¹⁷ Robert T. Cox & Robert S. Steigerwald, *A CCP is a CCP is a CCP*, FED. RES. BANK OF CHICAGO WORKING PAPER No. PDP 2017-01 (Apr. 5, 2017 final revised draft), at 1. One reviewer of this Article calls “the mutualisation of risk . . . one of the most important private ordering benefits of CCPs, one that is often overlook[ed].” E-mail from Paolo Saguato, Assistant Professor of Law, Antonin Scalia Law School, George Mason University, to the author (Jan. 13, 2018).

¹⁸ Mutualizing a risk refers to dividing it among multiple parties to reduce the chance that its occurrence will cause significant financial loss to any one party. *See infra* note 208 and accompanying text.

¹⁹ *See infra* notes 28-38 and accompanying text.

important counterparties.²⁰ Finally, the Article uses that insight to theorize and explain when regulation should require central clearing for non-derivative financial contracts.²¹

A. Terminology

The analysis builds on the following foundational terminology. Consistent with financial industry shorthand, references to “clearing” also include settlement. References to “central clearing” mean the clearing (and thus settlement) of contracts through CCPs. Central clearing of a non-derivative financial contract therefore means using a CCP to transmit, reconcile, and confirm each transfer to be made under such contract²² and then to complete the transfer by paying funds or assigning securities as needed to satisfy counterparty obligations thereunder.²³ The term “counterparty” means, as the context indicates, either the contracting parties themselves or a CCP acting as a central counterparty. Applying these terms, central clearing of a loan agreement—which exemplifies a straightforward non-derivative financial contract—means using a CCP (acting as a central counterparty) to monitor the amount and dates of payments to be made thereunder and to make each such payment, when due, to the (counterparty) lender on behalf of the (counterparty) borrower.²⁴

References to a “financial contract” mean any contract—exemplified above by a loan agreement—that governs a financial or financing transaction. A derivatives contract is a specific type of financial contract: one that derives its value from the future performance of an underlying asset, index, or other reference entity.²⁵ In that sense, it is a

²⁰ See *infra* notes 38-42 and accompanying text.

²¹ Cf. OXFORD AMERICAN DICTIONARY (1986) (defining “theory” as “a set of ideas formulated (by reasoning from known facts) to explain something.”).

²² See *supra* note 3 and accompanying text (defining clearing of derivatives contracts).

²³ See *supra* note 4 and accompanying text (defining settlement of derivatives contracts).

²⁴ As discussed (*see* text accompanying note 8, *supra*), this reflects that the CCP legally substitutes its credit for that of the contracting parties, making the CCP the primary counterparty on both sides of the contract—in the case of loan agreements, the lender to every borrower and the borrower to every lender.

²⁵ Lynn A. Stout, *Derivatives and the Legal Origin of the 2008 Credit Crisis*, 1 HARV. BUS. L. REV. 1, 6 (2011).

“bet” on that future underlying performance.²⁶ For example, Party A may enter into a derivatives contract today to sell 1,000 shares of XYZ stock, currently having a market value of \$70 per share, to Party B a year from now, at that same price. If a year hence the market value of XYZ stock has fallen to \$50 per share, Party A would benefit.²⁷ But if that market value had instead risen to \$80 per share, Party B would benefit.

B. Historical Context

The move to require central clearing of derivatives contracts assumes that derivatives contracts are unusually systemically risky and, indeed, were a cause of the financial crisis.²⁸ The media portrayed American International Group (“AIG”)—which was potentially liable under multiple credit-default swaps (“CDS”), a type of derivatives contract,²⁹ to investors in mortgage-backed securities (“MBS”)³⁰—as a “poster child” for

²⁶ *Id.* (observing that derivatives contracts are “bets,” being “agreements between parties that one will pay the other a sum of money that is determined by whether or not a particular event occurs in the future”).

²⁷ Party A could, for example, then purchase the 1,000 shares at \$50 per share and immediately resell them to Party B at \$70 per share, making a \$20 per share profit. Or the parties could settle that contract by the simple payment of that net amount by Party B to Party A.

²⁸ To some extent also, the move to require central clearing of derivatives contracts might indirectly respond to certain pre-crisis publicized losses on derivatives contracts, such as the highly publicized losses by Orange County, CA, and its subsequent bankruptcy, as well as the highly publicized losses by Gibson Greetings. The problem with those derivatives contracts, however, was not counterparty risk but their unusual complexity.

²⁹ To understand a CDS, a special type of derivatives contract sometimes called a “credit derivative,” consider the example of Party A making a loan to Party B. If Party A is concerned about Party B’s ability to repay the loan, Party A (in this capacity, the protection buyer) may enter into a CDS contract with Party C (the protection seller) under which Party C agrees to make any payments that Party B fails to make. In exchange for this protection, Party A pays Party C a fee. Protection sellers may enter into many CDS contracts, thereby earning fee income while helping market participants to hedge risk. Although documented as a derivatives contract on ISDA forms, a CDS contract is fundamentally a guarantee.

³⁰ See Christoph Henkel, *Harmonizing European Union Bank Resolution: Central Clearing of OTC Derivative Contracts Maintaining the Status Quo of Safe Harbors*, 22 *TRANSNAT’L L. & CONTEMP. PROBS.* 81, 95 (2013); Stephen J. Lubben, *Repeal the Safe Harbors*, 18 *AM. BANKR. INST. L. REV.* 319, 320 (2010). At least some of those “investors” may not actually have owned MBS; instead, they directly or indirectly purchased protection under CDS contracts whose payments tied to MBS pricing.

that crisis.³¹ The collapse of the MBS market threatened AIG’s financial integrity as panicking investors commenced collection actions on their CDS contracts.³² Observers believe that, absent its government bailout, AIG would have collapsed and caused massive systemic harm.³³ Although his statement is often taken out of context, Warren Buffet added fuel to the fire by famously referring to derivatives contracts as “financial weapons of mass destruction.”³⁴

³¹ See, e.g., Michael S. Barr & Joe Valenti, *Commentary: How the CFPB Fight Is a Sign of the Next Financial Crisis*, FORTUNE.COM, Dec. 6, 2017 (referring to AIG as the “poster child of the financial crisis”), available at <http://fortune.com/2017/12/06/cfpb-director-mick-mulvaney-leandra-english/>.

³² See Lubben, *supra* note 30, at 320. Ironically, the safe harbor provisions of U.S. bankruptcy law appear to have exacerbated AIG’s position by allowing counterparty suits to go forward notwithstanding the automatic stay. *Id.* These provisions give derivatives-contract counterparties “virtually unlimited enforcement rights against [a counterparty] debtor.” See Steven L. Schwarcz, *Derivatives and Collateral: Balancing Remedies and Systemic Risk*, 2015 U. ILLINOIS L. REV. 699, 700 (hereinafter, “*Derivatives and Collateral*”). This deprives a systemically important counterparty debtor of bankruptcy law’s protections, including the automatic stay, “thereby hastening [its] collapse.” *Id.* at 707. See also Systemic Risk and the Impacts of Central Clearing, available at <http://www.swapclear.com/Images/ccp%20risk%20study%20paper.pdf>. For that reason, I have argued that “the safe harbor’s application should be limited to remedies pursued by SIFIs against non-SIFIs.” *Derivatives and Collateral*, *supra* at 712 & 718 (using the term “SIFI”, as is common, to refer to a systemically important financial institution).

³³ See Felix Salmon, *Why AIG Wasn’t Allowed To Fail*, Reuters (Mar. 17, 2009), <http://blogs.reuters.com/felix-salmon/2009/03/17/why-aig-wasnt-allowed-to-fail/>.

³⁴ Warren Buffet, Letter to Berkshire Hathaway Shareholders (2002). The media also has suggested that Lehman Brother’s derivatives contracts were unusually systemically risky. See, e.g., Jeffrey McCracken, *Lehman’s Chaotic Bankruptcy Filing Destroyed Billions in Value*, WALL ST. J. (Dec. 29, 2008), available at <https://www.wsj.com/articles/SB123050916770038267> (reporting that the early termination of Lehman Brother’s derivatives contracts is estimated to have cost the firm approximately 50 billion dollars). Ironically, as in AIG, this cost instead resulted from the safe harbor provisions of U.S. bankruptcy law purporting to protect derivatives counterparties. *Cf. supra* note 32 (observing that those safe harbor provisions exacerbated AIG’s position by allowing counterparty suits to go forward notwithstanding the automatic stay); Testimony of Harvey Miller, lead counsel for Lehman Brothers’ bankruptcy, *Too Big to Fail: The Role for Bankruptcy and Antitrust Law in Financial Regulation Reform: Hearing Before the Subcomm. on Commercial and Administrative Law, Comm. on the Judiciary*, 111th Cong. 9 (2009) (testifying that Lehman’s lack of automatic stay protection in bankruptcy, due to those safe harbor provisions, led to a state of confusion and chaos).

In response, the Dodd-Frank Act—the Congressional legislation that seeks to redress the excesses that led to the financial crisis³⁵—and follow-up regulation by the Securities and Exchange Commission (SEC) and Commodities Futures Trading Commission (CFTC) require that many derivatives contracts be centrally cleared through CCPs.³⁶ In accord with recommendations of the Financial Stability Board, an organization established by the G20 nations to monitor and make recommendations about the global financial system, numerous jurisdictions outside the United States have similarly begun requiring central clearing of derivatives contracts.³⁷ If AIG’s CDS contracts were centrally cleared, the argument goes, it would not have needed a government bailout.³⁸

In the first instance, the answer to this Article’s question—whether regulators should also require non-derivative financial contracts to be centrally cleared—turns on understanding why derivatives contracts are systemically risky. If derivatives contracts are inherently systemically riskier than non-derivative financial contracts, then centrally clearing non-derivative financial contracts might only marginally reduce systemic risk. If, however, derivatives contracts are systemically risky because of a trait they share with non-derivative financial contracts, then it could be valuable to extend central clearing to non-derivative financial contracts that share that trait.

³⁵ The Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203 (2010).

³⁶ Title VII of the Dodd-Frank Act sets forth general requirements for derivatives, subsequently expanded through SEC and CFTC regulation. *See, e.g.*, U.S. Securities and Exchange Commission, “Derivatives” (2015), available at <https://www.sec.gov/spotlight/dodd-frank/derivatives.shtml>.

³⁷ *See, e.g.*, RICHARD HECKINGER, IVANA RUFFINI, & KIRSTIN WELLS, UNDERSTANDING DERIVATIVES: MARKETS AND INFRASTRUCTURE 32 (2014) (summarizing the regulatory history of the central clearing mandate for derivatives contracts).

³⁸ *Cf. supra* notes 29-33 and accompanying text (discussing AIG’s near failure). As this Article will explain, however, that begs the question whether the CCP would have needed a government bailout. *See infra* Part IV.

The Article's analysis proceeds as follows. Part I examines the systemic riskiness of financial contracts. It finds that derivatives contracts are not inherently systemically risky; rather, their systemic riskiness derives from their systemically important counterparties. Observing that non-derivative financial contracts sometimes also have systemically important counterparties, Part I then builds on that shared trait to derive a theory to explain when regulation should require central clearing of non-derivative financial contracts. Part II develops the theory by testing it against current regulation requiring the central clearing of derivatives contracts. Part III examines the theory's regulatory and economic efficiency implications for determining whether to expand central clearing to non-derivative financial contracts. It also identifies and balances the benefits and costs of such a regulatory expansion. Part IV examines how to limit the costs of such an expansion, including by adapting the protections against CCP risk concentration that currently apply to central clearing of derivatives contracts. It also examines how to enhance those protections. Part V focuses in depth on two fundamental legal questions raised by central clearing: whether regulators should mandate how financial institutions should control risk, and whether they should require financial institutions to mutualize risk. Appendix 1 to the Article illustrates how non-derivative financial contracts could be centrally cleared and compares that to the central clearing of derivatives contracts. Finally, Appendix 2 explains how to standardize non-derivative financial contracts, showing that such standardization would be quite feasible because, among other reasons, non-derivative financial contracts already are commonly documented on standardized forms.

I. EXAMINING THE SYSTEMIC RISKINESS OF FINANCIAL CONTRACTS

As discussed, regulators assume that derivatives contracts are inherently systemically risky, suggesting that something about their nature creates that risk. That assumption, however, has never been rigorously tested. Subpart A next examines the nature of derivatives contracts to explain their systemic riskiness. Thereafter, subpart B uses insights from that inquiry to explain the potential systemic riskiness of non-derivative financial contracts.

A. Explaining Why Derivatives Contracts are Systemically Risky

There are almost no formal studies of the inherent systemic riskiness of derivatives contracts,³⁹ much less studies comparing the systemic riskiness of derivatives and non-derivative financial contracts. Most of the discussion has been anecdotal. Some argue, for example, that derivatives contracts are especially systemically risky because derivatives are bets.⁴⁰ However, all financial contracts are bets. A loan agreement is a bet by a lender that the borrower will repay the loan on a timely basis, with interest. Even a simple guarantee is a bet by the guarantor, in consideration of a guarantee fee, that the guaranteed obligation will not default.

Others suggest that derivatives contracts are especially systemically risky because derivatives are volatile: “unlike other contracts, the value of [derivatives contracts] typically can change rapidly based on the fluctuating value of the underlying assets or collateral, prevailing market conditions and other factors.”⁴¹ Volatility in turn can create the possibility of indeterminate liability. Consider, for example, an interest-rate swap in which Party A exchanges its fixed interest-rate payments for Party B’s floating rate payments (based, for example, on LIBOR). If interest rates fall, Party B will take a loss that cannot be precisely quantified ex-ante because it will depend on the magnitude of the interest-rate change.

³⁹ *But compare* the studies referenced *infra* notes 57-58 (supporting this Article’s explanation of why derivatives contracts are systemically risky) *with* Yesha Yadav, *The Problematic Case of Clearinghouses in Complex Markets*, 101 GEO. L.J. 391 (2013) (discussing the inherent riskiness of credit-derivatives contracts, a special type of derivatives contract).

⁴⁰ *Cf. supra* note 26 and accompanying text (characterizing derivatives contracts as bets).

⁴¹ *Exploring Chapter 11 Reform: Corporate and Financial Institution Insolvencies; Treatment of Derivatives: Hearing Before the Subcomm. on Regulatory Reform, Commercial and Antitrust Law of the H. Comm. on the Judiciary*, 113th Cong. 8 (2014) (statement of Seth Grosshandler, Partner, Cleary Gottlieb Steen & Hamilton LLP).

Nonetheless, the parties usually can estimate the limits of their potential liability.⁴² In the interest-rate swap example, there is indeterminate liability insofar as the parties cannot know, when they enter into the derivatives contract, the sign (positive or negative) and magnitude of the interest-rate change. In reality, however, they will know from market experience and be able to model the likely maximum range of any interest-rate change within the timeframe of their contractual settlement date.⁴³ Similarly, in the example of Party A contracting to sell 1,000 shares of XYZ stock to Party B a year hence at \$70 per share (its current market value),⁴⁴ there is indeterminate liability insofar as the parties cannot currently know the sign and magnitude of XYZ stock's change in market value. In reality, again, they will know from market experience and be able to calculate the likely maximum range of any such change within the next year.⁴⁵ Furthermore, the derivatives contracts that some have identified as the most dangerous type—credit derivatives⁴⁶—actually have fairly precisely known maximum liabilities: in the case of a CDS guaranteeing repayment of a loan, for example, the maximum liability would be the principal and interest accruing on the loan through the settlement date.⁴⁷

⁴² Cf. René M. Stulz, *Should We Fear Derivatives?*, 18 J. ECON. PERSPECTIVES 173, 186 (2004) (observing that, “Since 1994, regular users of derivatives have made considerable progress in measuring the risks of derivatives portfolios. . . . With these tools, firms that use derivatives regularly know their risks reasonably well”; but cautioning that “these measurement tools do not always work well”).

⁴³ See, e.g., PAUL G. FERRARA SEYED & ALI NEZZAMODDINI, *INTEREST RATE SWAPS—AN EXPOSURE ANALYSIS* (2013) (discussing how parties estimate their likely exposure to interest-rate change within the timeframe of their contractual settlement date).

⁴⁴ See text accompanying notes 26-27, *supra*.

⁴⁵ Cf. *infra* note 52 and accompanying text (observing that accountants have devised a range of methodologies to estimate potential liability for even the most complex derivatives).

⁴⁶ See Yadav, *supra* note 39. See also *supra* note 29 and accompanying text (explaining credit derivatives).

⁴⁷ Cf. Prudential Financial, Inc. 2014 Annual Report, at 206 (“The Company’s maximum amount at risk under [its] credit derivatives equals the aforementioned notional amounts [i.e., principal and interest on the underlying obligations on which Prudential sold credit protection] and assumes the value of the underlying referenced securities [i.e., their principal and interest payable thereunder] become[s] worthless.”), available at <https://www.prudential.com/documents/public/Prudential-AR2014.pdf>.

Although the foregoing interest-rate swap and CDS examples (which reflect some of the most common types of derivatives contracts) are relatively simple, parties usually can estimate the limits of their potential liability even under much more complex derivatives. The disclosure of this liability is in fact an accounting requirement. Government securities regulators⁴⁸ have delegated to the accounting profession⁴⁹ the duty to disclose financial information—including information about the fair value of derivatives as either assets or liabilities⁵⁰—through formalized financial statements, such as balance sheets and income statements; the goal is to provide the “credib[ility], transparen[cy], and comparab[ility]” needed for “the efficient functioning of the economy.”⁵¹ To facilitate that required disclosure about derivatives liability, accountants have devised a range of methodologies to estimate potential liability for even the most complex derivatives.⁵²

⁴⁸ In the United States, the Securities and Exchange Commission. *See* Steven L. Schwarcz, *Private Ordering*, 97 NW. U. L. REV. 319, 320, 346-47 (2002) (discussing the SEC’s delegation of disclosure power to the accounting profession).

⁴⁹ In the United States, to the Financial Accounting Standards Board, or FASB. *Id.*

⁵⁰ In the United States, this is governed by Financial Accounting Standard (FAS) No. 133, which “establishes accounting and reporting standards for derivative instruments” and “requires that an entity recognize all derivatives as either assets or liabilities in the statement of financial position and measure those instruments at fair value.” *See* <http://www.fasb.org/st/summary/stsum133.shtml>. FAS 133 has been amended by FAS 161, which requires even further enhanced derivatives disclosure. *See* <http://www.fasb.org/pdf/fas161.pdf>.

⁵¹ FINANCIAL ACCOUNTING STANDARDS BOARD, FACTS ABOUT FASB 1 (2003-2004) (available at www.fasb.org).

⁵² *See, e.g.*, Ernst & Young, *Applying IFRS 13 Fair Value Measurement, Credit Valuation Adjustment for Derivatives Contracts* (Apr. 2014). This publication discusses various approaches for calculating valuation adjustments to fairly value derivatives contracts—fair value meaning in this context (as defined by IFRS 13) “the price that would be . . . paid to transfer a liability in an orderly transaction between market participants at the measurement date.” The Deloitte accounting firm defines fair value under IFRS 13 more intuitively as “how much the reporting entity has to pay to a market participant such that the market participant is willing to take over the liability.” Deloitte LLP, *Summary guidance and practical tips for IFRS 13 – Fair Value Measurement*, available at <https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/audit/ca-en-audit-clearly-ifrs-fair-value-measurement-ifrs-13.pdf>. The “most advanced approach” is the Expected Future Exposure (EFE) approach, which is used by banks and other financial institutions with large derivative portfolios and can be “used for many types of derivatives.” Ernst & Young, *supra*. Because the EFE approach “can be very complex

For these reasons, volatility alone does not make derivatives contracts systemically riskier than non-derivative financial contracts. That leaves only one other factor that can explain the systemic riskiness of derivatives contracts: most such contracts have at least one large⁵³ and highly interconnected⁵⁴ financial institution as a counterparty. The three main determinants of systemic risk are size, interconnectedness, and substitutability.⁵⁵ Having a large and highly interconnected financial institution as a counterparty (hereinafter, a “systemically important counterparty”) causes derivatives contracts to incorporate two of those three determinants of systemic risk.⁵⁶

The little research examining why derivatives contracts are systemically risky supports the view that their riskiness turns on the systemically important nature of their

and it needs to be executed by quantitative experts and requires access to significant IT systems,” many firms “have adopted alternative approaches for estimating” liability on their derivatives contracts. *Id.*

⁵³ Cf. Franklin R. Edwards & Edward R. Morrison, *Derivatives and Systemic Risk: What Role Can the Bankruptcy Code Play?* 3, available at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.499.8426&rep=rep1&type=pdf> (finding that relatively few banks effectively control the derivatives market, and that seven U.S. banks hold more than 95% of the U.S. notional derivatives exposure).

⁵⁴ See, e.g., Christopher S. Dwight, Note, *Missed (Inter)Connections: Proposed Revisions to the Federal Reserve’s Approach to Financial Stability Analysis Under the Bank Holding Company Act*, 18 N.C. Banking Inst. 599, 603 (2014) (arguing that derivatives counterparties are highly interconnected because they engage in multiple transactions with other systemically important firms).

⁵⁵ See *Derivatives and Collateral*, *supra* note 32, at 704.

⁵⁶ Cf. Systemic Risk and the Macroeconomy: An Attempt at Perspective, *available at* <https://www.stlouisfed.org/from-the-president/speeches-and-presentations/2008/systemic-risk-and-the-macroeconomy-an-attempt-at-perspective> (arguing that the failure of a large and highly interconnected counterparty can lead to a “domino effect,” setting off a pattern of failures among its counterparties). *But cf.* Rizwaan Jameel Mokal, *Liquidity, Systemic Risk, and the Bankruptcy Treatment of Financial Contracts*, 10 BROOKLYN J. CORP. FIN. & COM. L. 15 (2015) (arguing that counterparty failure may not be a significant source of systemic risk). Professor Mokal contends that the premise of the domino-effect risk, that a significant market participant’s failure to meet its obligations would result in similar failures by its counterparties, is a relic of the flawed microprudential understanding of systemic risk; among other hurdles, he maintains, a domino-effect collapse would require an implausibly large initial failure.

counterparties. Economists at the New York Federal Reserve Bank and finance scholars at Yale find, for example, that derivatives “create[] systemic risk” when the failure of a derivatives counterparty “could seriously impair the financial condition of one or more of its [systemically important] counterparties.”⁵⁷ No research appears to contradict that finding.⁵⁸

B. Explaining Why Non-Derivative Financial Contracts could be Systemically Risky

The insight that the systemic riskiness of derivatives contracts turns on the nature of their counterparties, not on their inherent nature, indicates that non-derivative financial contracts with systemically important counterparties could also be systemically risky.⁵⁹ That presumes, of course, that the systemically important counterparty is exposed to counterparty risk.⁶⁰ That presumption should be valid because virtually all financial contracts—whether derivatives or non-derivatives—create counterparty risk, which results from the performance of obligations over time.⁶¹ Financial contracts depend on

⁵⁷ Rosalind Z. Wiggins & Andrew Metrick, *The Lehman Brothers Bankruptcy G: The Special Case of Derivatives*, Yale Program on Financial Stability Case Study 2014-36-V1 (Oct. 1, 2014, revised Apr. 7, 2015), at 15-16 (quoting with approval a New York Federal Reserve study).

⁵⁸ Although one study suggests that the “complexity and limited transparency of the [OTC derivatives] market reinforced the potential for excessive risk-taking” and thus counterparty failure (Darrell Duffie, Ada Li, & Theo Lubke, *Policy Perspectives on OTC Derivatives Market Infrastructure*, Fed. Res. Bank NY Staff Report No. 424 (Jan. 2010, revised Mar. 2010), at 1), excessive risk-taking by financial firms has a wide range of causes. *See infra* note 143 and accompanying text. Moreover, OTC derivatives contracts are not always centrally cleared.

⁵⁹ Incongruously, the Dodd-Frank requirement to centrally clear derivatives contracts through CCPs applies whether or not a derivatives contract has any systemically important counterparties.

⁶⁰ *Cf. supra* note 10 and accompanying text (defining counterparty risk).

⁶¹ *Cf.* Statement of Katharina Pistor, Michael I. Sovern Professor of Law, Columbia Law School, at the Federal Reserve Bank of Chicago’s 47th Annual Conference on Bank Structure and Competition (May 5, 2011) (stating that it “is the performance of obligations over time . . . which introduces the liquidity and counterparty risks at the heart of the contemporary policy debates surrounding the regulation of [derivatives] markets”).

future performance.⁶² Even the simplest loan agreement, for example, depends on the borrower being able to repay principal and interest in the future.⁶³

Indeed, much of the financial institution counterparty risk that triggered the financial crisis arose under non-derivative financial contracts. Although some identify Lehman Brothers' bankruptcy as a cause of the financial crisis,⁶⁴ Lehman's counterparty risk first arose under MBS contracts, which are non-derivative financial contracts.⁶⁵ Lehman's counterparties began demanding collateral out of concern that the collapse of the MBS market was causing Lehman's large MBS investments to become worthless.⁶⁶

⁶² The exceptions are very limited, such as a "spot" contract, a subset of derivatives contracts in which the contract performance is immediate—such as a traveler exchanging U.S. dollars for euros at an airport at the then-posted exchange rate.

⁶³ See *supra* note 40 and following text. One reviewer of this Article asked whether the fact that non-derivative financial contracts create "one-sided counterparty credit risk, while most derivatives present two-sided risk" might make derivatives contracts systemically riskier. It should not for at least two reasons. First, relatively more counterparties to derivatives contracts are systemically important (*see infra* note 74), so the likelihood any counterparty defaults is less than for non-systemically-important counterparties. Second, non-derivative financial contracts also effectively have two-sided risk. This Article focuses on the risk that a counterparty borrower defaults in repaying a systemically important counterparty lender, causing it to fail; but the counterparty borrower also bears the risk that its financial condition will deteriorate during the loan term, causing it to default.

⁶⁴ See, e.g., Viral Acharya et al., *The Financial Crisis of 2007-2009: Causes and Remedies*, 18 FIN. MARKETS INSTITUTIONS & INSTRUMENTS 89, 93 (2009) (stating that Lehman's bankruptcy "led to the near collapse of the financial system").

⁶⁵ MBS, or mortgage-backed securities, are promissory notes backed by interests in mortgage loans. See, e.g., *U.S. Bank Nat. Ass'n v. Ibanez*, 941 N.E.2d 40, 51 (Mass. 2011) (stating that "mortgage loans are pooled together in a trust and converted into mortgage-backed securities, the underlying promissory notes serve as financial instruments generating a potential income stream for investors"). Normally, derivatives have nothing to do with MBS. See, e.g., FIRST EMPIRE SECURITIES, MORTGAGE BACKED SECURITIES 4 (stating [emphasis in original] that "it is important to understand the MBSs ARE NOT MORTGAGE DERIVATIVE INVESTMENTS"), available at <http://www.1empire.com/Forms/MBS.pdf>.

⁶⁶ See Laurence Ball, "The Fed and Lehman Brothers" 7-8 (July 2016), available at www.econ2.jhu.edu/People/Ball/Lehman.pdf (observing that collateral calls by counterparties, including demands for collateral from JP Morgan Chase, the clearing bank for Lehman's tri-party repos, contributed to Lehman's collapse). Cf. *supra* note 81

Although Lehman filed for bankruptcy protection in response to those demands, the problems with Lehman's derivatives contracts arose only once Lehman went into bankruptcy.⁶⁷

Similarly, although the move to require central clearing of derivatives contracts assumes those contracts were a cause of the financial crisis,⁶⁸ derivatives-contract problems were more of an effect than a cause. CDS investors commenced collection actions against AIG because of the collapse of the MBS market.⁶⁹ They would not have done so absent that collapse because AIG would have been able to pay its liability on the CDS.

Observers also identify the failure of the repo market as a cause of the financial crisis.⁷⁰ Repos are non-derivative financial contracts—short-term secured loans couched as sales and repurchases of securities that serve as the collateral for the loan, not unlike a conditional sales agreement.⁷¹ Because the amount of the repo market is huge, scholars are beginning to argue for the central clearing of repo transactions.⁷²

Informed by these observations, this Article's question can be restated more precisely: *Should regulators require non-derivative financial contracts that have at least one systemically important counterparty to be centrally cleared, in order to reduce*

and accompanying text (discussing how the fear of counterparty risk could lead to a systemically important firm's failure).

⁶⁷ Cf. *supra* note 34 (explaining why Lehman's derivatives problems resulted from its bankruptcy).

⁶⁸ See *supra* note 29 and accompanying text.

⁶⁹ See *supra* note 32 and accompanying text.

⁷⁰ See, e.g., Gary Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo*, 104 J. FIN. ECON. 425 (2012).

⁷¹ See UCC 1-201(35) (observing that a conditional sales agreement is, in essence, a secured loan).

⁷² See, e.g., Paolo Saguato, *The Liquidity Dilemma and the Repo Market: A Two-Step Policy Option to Address the Regulatory Void*, 22 STAN. J. L. BUS. & FIN. 85 (2017) (arguing that CCPs should be used to reduce risk in the repo markets). Repo dealers already voluntarily engage in a form of central clearing. See *infra* notes 174-175 and accompanying text.

systemic risk?⁷³ Consistent with this restatement, further references in this Article to non-derivative financial contracts shall mean only such contracts that have at least one systemically important counterparty.⁷⁴

The restated question can also be reformulated as an initial theory⁷⁵: To reduce systemic risk, regulators should require central clearing of non-derivative financial contracts that have at least one systemically important counterparty. That theory is incomplete, however, because financial regulation is justified only if its benefits exceed its costs.⁷⁶ Although requiring central clearing of non-derivative financial contracts will

⁷³ This Article does not need to differentiate at the outset whether the systemically important counterparty is an obligor or an obligee. Using the preceding example of a loan agreement (*see supra* notes 23-24 and accompanying text), if the systemically important counterparty is a lender (an obligee), the failure of the borrower (an obligor) to repay the loan may cause the lender's failure; whereas if the systemically important counterparty is a borrower (an obligor), its repayment exposure might cause its failure especially if that exposure is aggregated on multiple loans—such as might occur for a highly leveraged firm. *Cf. supra* note 29 and accompanying text. (discussing AIG's pre-crisis aggregated counterparty exposure on CDS contracts).

⁷⁴ Because derivatives markets are relatively concentrated (*see Derivatives and Collateral, supra* note 32, at 706), a derivatives contract may be more likely than a non-derivative financial contract to have not just one but two systemically important counterparties. If systemic riskiness were to turn on the contract having at least two systemically important counterparties, this Article's analysis of expanding central clearing to non-derivative financial contracts should be limited to financial contracts that have at least two such counterparties. Analytically, though, a financial contract that has just one systemically important counterparty can be systemically risky. Indeed, a financial contract that has two parties, both of whom are systemically important, may be less systemically risky than a financial contract that has just one systemically important counterparty. Both parties to the former contract, being systemically important, would be legally required to maintain capital and other protections that minimize their likely failure. Therefore neither would likely default under the contract. The non-systemically-important counterparty to the latter contract would thus be more likely to default, which could destabilize that contract's systemically important counterparty.

⁷⁵ Again, this Article uses the term “theory” in its fundamental meaning as a set of ideas that help to explain something. *See supra* note 21 and accompanying text.

⁷⁶ *See, e.g.,* Cass R. Sunstein, *Financial Regulation and Cost-Benefit Analysis*, 124 *YALE L.J.F.* 263, 263 (2015) (explaining that “[c]ost-benefit analysis is best understood as a way for agencies to ensure that their decisions are informed”); Eric Posner & E. Glen Weyl, *Benefit-Cost Paradigms in Financial Regulation*, 43 *J. LEG. STUD.* 1, 3 (2014) (arguing that financial regulation should be subject to cost-benefit analysis). *Cf. Cost-*

create benefits by reducing systemic risk resulting from individual counterparty risk, it can also create costs, notably the transaction costs of creating and operating the CCPs and the possible systemic costs of concentrating counterparty risk in the CCPs.⁷⁷ A complete theory should take into account those benefits and costs.⁷⁸

To help develop this theory, the Article next tests it against current regulation requiring the central clearing of derivatives contracts.

II. CENTRAL CLEARING OF DERIVATIVES CONTRACTS

As discussed, the United States and many other nations are requiring counterparties to centrally clear most of their derivatives contracts through CCPs.⁷⁹ In principle, this makes sense as a way to reduce systemic risk if, as is often the case, the derivatives contract has at least one systemically important counterparty.⁸⁰ Counterparty

Benefit Analysis, BLACK'S LAW DICTIONARY (10th ed. 2014) (defining cost-benefit analysis as “[a]n analytical technique that weighs the costs of a proposed decision”); BOUVIER LAW DICTIONARY 1151 (Stephen Michael Sheppard ed., Compact ed. 2011) (observing that federal agency cost-benefit analysis for determining whether a new regulation is promulgated “must demonstrate that the benefits to society outweigh the costs that the regulation will impose”).

⁷⁷ See, e.g., Viktoria Baklanova, Ocean Dalton, & Stathis Tompaidis, *Benefits and Risks of Central Clearing in the Repo Market*, Office of Financial Research Brief Series No. 17-04 (Mar. 9, 2017) (discussing those costs). Cf. 90 and accompanying text (observing that central clearing creates systemic costs by concentrating counterparty risk in the CCPs).

⁷⁸ But cf. *infra* note 85 and accompanying text (observing the Dodd-Frank Act’s mandate that reducing systemic risk is so urgent that regulation reducing that risk should not be conditioned on a cost-benefit analysis). This Article’s analysis is normative, so it does not purport to rely on that mandate. That mandate has also been questioned in the context of designating insurance company Metropolitan Life as systemically important. See, e.g., John Heltman, *FSOC Gives Up Effort to Designate MetLife as SIFI*, AM. BANKER, Jan. 18, 2018.

⁷⁹ See *supra* notes 28-38 and accompanying text (also explaining that this central clearing requirement is largely a response to the financial crisis, in which counterparty risk in derivatives contracts played out in dramatic fashion).

⁸⁰ CCPs may also add value as central information aggregators. Adam J. Levitin, *Response: The Tenuous Case for Derivatives Clearinghouses*, 101 GEO. L.J. 445, 452-53 (2013). See also R.A. Washington, *Derivatives: What is a Clearinghouse?*,

risk that causes the failure—or even the fear of failure—of systemically important counterparties can trigger systemic risk.⁸¹ By protecting systemically important counterparties from counterparty risk, central clearing can remove that trigger.⁸²

As indicated, however, financial regulation is justified only if its benefits exceed its costs.⁸³ The current regulation requiring the central clearing of derivatives contracts does not appear to be justified by any formal cost-benefit analyses.⁸⁴ At least in the

ECONOMIST, Apr. 22, 2010, available at <http://www.economist.com/blogs/freeexchange/2010/04/derivatives>. This role arguably gives CCPs the capacity to create derivatives markets that are less opaque than traditional over-the-counter derivatives markets. Levitin, *supra* at 451-52.

⁸¹ Cf. Duffie, Li, & Lubke, *supra* note 58, at 5 (observing that systemic risk “also arises when the fear of . . . failure could lead counterparties to attempt to avoid potential losses by reducing their exposures to a large, weak market participant, possibly contributing to a ‘run’ that indeed accelerates the failure of that market participant”). Cf. *infra* note 66 and accompanying text (discussing how fear of contracting with Lehman Brothers similarly led to its failure).

⁸² Absent central counterparty clearing, for example, a concentration of counterparty exposure on a CDS protection seller (*see supra* note 29 and accompanying text) could cause its failure. If the protection seller is systemically important, its failure in turn could potentially trigger a broader systemic economic collapse. The protection seller’s failure could cause that collapse not merely by virtue of its inability to pay its general obligations but also by virtue of its inability to pay its guarantee obligations on the CDS contracts. This was the very fear that prompted the government to bail out AIG, the protection seller on multiple CDS contracts guaranteeing repayment on mortgage-backed securities. *See supra* note 33 and accompanying text.

⁸³ *See supra* notes 76-78 and accompanying text.

⁸⁴ In discussing central clearing of OTC derivatives, the International Monetary Fund (IMF) merely stated without analysis that “ultimately the benefits of systemic risk reduction from moving OTC derivatives to a CCP very likely outweigh the costs in the long run.” INTERNATIONAL MONETARY FUND, GLOBAL FINANCIAL STABILITY REPORT: MEETING NEW CHALLENGES TO STABILITY AND BUILDING A SAFER SYSTEM, Ch. 3, at 26 (Apr. 2010), available at <https://www.imf.org/external/pubs/ft/gfsr/2010/01/pdf/chap3.pdf>. When the European Commission mandated central clearing of standardized OTC derivatives by amending the European Market Infrastructure Regulation (“EMIR”), it pointed to “commitment[s]” by G-20 leaders in 2009 and 2010 to centrally clear these derivatives; but no cost-benefit analysis justified those commitments. *See* Regulation (EU) No. 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories, available at <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32012R0648>; *see also* [Central Clearing](http://europa.eu/rapid/press-</p>
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United States, that may well reflect the Dodd-Frank Act’s mandate that reducing systemic risk is so important that regulation reducing that risk should not be conditioned on a traditional cost-benefit analysis.⁸⁵

Implicitly, however, regulators have made certain cost-benefit judgments. The costs of central clearing include the transaction costs of creating and operating the CCPs and also, ironically, systemic costs resulting from concentrating counterparty risk in the CCPs.⁸⁶ Some scholars argue that requiring central clearing does not even reduce but merely shifts counterparty—and thus systemic—risk from individual counterparties to the CCPs.⁸⁷ Regulators have partly limited the transaction costs by restricting the central

release_MEMO-17-1583_en.htm. In 2016, the Commission extended the EMIR central-clearing mandate to certain CDS contracts, again without providing a cost-benefit analysis. *See* Press Release, European Commission, Financial stability: New EU rules on central clearing for certain credit derivative contracts (Mar. 1, 2016), available at http://europa.eu/rapid/press-release_IP-16-463_en.htm (summarily concluding without providing analysis that “requiring these types of credit default swaps to be cleared through CCPs” allows “financial markets [to] become more stable and less risky”).

⁸⁵ The Federal Reserve Board, for example, interprets the Dodd-Frank Act as directing the Federal Reserve, when regulating to mitigate risks to the financial stability of the country, to bypass consideration of costs and benefits. *See, e.g.*, BOARD OF GOVERNORS OF THE FED. RES. SYS., CALIBRATING THE GSIB SURCHARGE 13 (2015) (stating that “cost-benefit analysis was not chosen as the primary calibration framework for the GSIB surcharge for two reasons [of which the first is that] it is not directly related to the mandate provided by the Dodd-Frank Act, which instructs the Board to mitigate risks to the financial stability of the United States”). *Cf.* Eric A. Posner & E. Glen Weyl, *Benefit-Cost Analysis for Financial Regulation*, 103 AM. ECON. REV. (issue no. 3) (2013) (observing that because U.S. financial regulatory agencies are so-called independent agencies, they have not regarded themselves as bound by executive orders requiring the use of cost-benefit analysis). Professors Posner and Weyl also discuss the importance of reducing systemic risk given that historical data suggest the cost of a systemic crisis can be as high as twenty percent of GDP. *Id.*

⁸⁶ To a lesser extent, central clearing can also create costs that arguably are systemic by imposing increased and more rigorous margin requirements, which can create significant liquidity funding needs. Diana Milanese, “Risk/Benefit Analysis of Central Clearing of Over-the-Counter (OTC) Derivatives and a Chaos Theory-Based Perspective on Clearing Mandates,” § 6.12.2 (dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Juridical Science, Graduate Division of the University of California, Berkeley, Summer 2017) (on file with author); Craig Pirrong, *The Inefficiency of Clearing Mandates*, CATO Institute, Policy Analysis No. 665 (2010).

⁸⁷ *See infra* note 145 and accompanying text.

clearing requirement to standardized derivatives contracts.⁸⁸ They also recognize the systemic costs.⁸⁹ One Federal Reserve expert warns that the “concentration of risk in CCPs must not be underestimated, as CCP failures, while rare, do happen.”⁹⁰ Regulators nonetheless appear to believe, without actually testing, that requiring central clearing of derivatives contracts reduces overall systemic risk notwithstanding CCP counterparty-risk concentration.⁹¹ At least in the United States, that belief may be based in part on the Dodd-Frank Act’s protection of certain CCPs as financial market utilities.⁹²

This Article does not engage the debate whether requiring central clearing of derivatives contracts reduces, or merely shifts, overall systemic risk. The widespread reality of that central clearing requirement indicates that it may well reduce overall systemic risk. The Article builds on that reality to analyze whether regulators should also require central clearing of non-derivative financial contracts. This approach follows the strong scholarly precedent for grafting a normative legal inquiry onto positive-law reality.⁹³ In other words, the Article does not necessarily agree with the positive-law reality; it merely uses it as an analytical starting point.

⁸⁸ See *infra* notes 129-132 and accompanying text (explaining why restricting central clearing to standardized financial contracts should reduce transaction costs).

⁸⁹ See, e.g., Jerome H. Powell, Central Clearing and Liquidity, Speech at the Federal Reserve Bank of Chicago Symposium on Central Clearing, Chicago, Illinois (June 23, 2017); Benoît Coeuré (Member of the Executive Board of the European Central Bank), Ensuring an Adequate Loss-Absorbing Capacity of Central Counterparties, Lecture at the at the Federal Reserve Bank of Chicago 2015 Symposium on Central Clearing, Chicago, Illinois (April 10, 2015).

⁹⁰ Ivana Ruffini, *Central Clearing: Risks and Customer Protections*, FRB CHICAGO ECONOMIC PERSPECTIVES, 4Q/2015, at 90, 97.

⁹¹ See, e.g., Mary L. Schapiro, Chairman, U.S. Securities and Exchange Commission, Address at the SEC Open Meeting (Dec. 15, 2010), available at <https://www.sec.gov/news/speech/2010/spch121510mls-1.htm>: “When structured and operated appropriately, clearing agencies provide important benefits like improving the management of counterparty risk [resulting from derivatives] and reducing outstanding exposures through multilateral netting of trades. Through these actions, the ‘clearing’ process can help to reduce risks to the financial system overall.”

⁹² See Part IV.A, *infra*.

⁹³ See, e.g., Lucian Arye Bebchuk, *A New Approach to Corporate Reorganizations*, 101 HARV. L. REV. 775, 776–77 (1988) (grafting a normative analysis of bankruptcy law (what should be the best method for dividing the corporate reorganization pie) onto a

As informed by this Part II, the Article's theory can be further restated as follows: To reduce systemic risk, regulation should require central clearing of non-derivative financial contracts that have at least one systemically important counterparty if the benefits of that clearing exceed its costs. To reduce costs, the regulation should (as with central clearing of derivatives contracts) restrict that central clearing to standardized financial contracts and protect the central-clearing CCPs against the systemic costs of concentrated counterparty risk. Pragmatically, central clearing should be further limited to only "material" contracts that have a minimum potential payment obligation.⁹⁴ Appendix 1 to the Article illustrates how such non-derivative financial contracts could be centrally cleared. It also compares that to the central clearing of derivatives contracts. Appendix 2 to the Article explains how to standardize non-derivative financial contracts.

Part III next examines the regulatory and economic efficiency implications of the restated theory.

III. CENTRAL CLEARING OF NON-DERIVATIVE FINANCIAL CONTRACTS

Reducing systemic risk is an important regulatory goal.⁹⁵ Central clearing of non-derivative financial contracts can, in principle, significantly reduce that risk.⁹⁶ Therefore,

positive assumption about that law (taking as given the widespread use of the corporate reorganization alternative to liquidation)).

⁹⁴ The minimum should be based on the amount of defaulted payment that could reasonably destabilize a systemically important counterparty. Although setting the minimum would be a regulatory judgment, the author anticipates it would exceed, and might far exceed, \$10 million.

⁹⁵ *Cf. supra* notes 84-85 and accompanying text (observing the regulatory importance of reducing systemic risk).

⁹⁶ Parts I and II of this Article have shown that non-derivative financial contracts could be systemically risky, that the aggregate net counterparty exposure on those contracts greatly exceeds that on derivatives contracts, and that central clearing of those contracts could reduce systemic risk the same way that it reduces systemic risk for derivatives contracts.

regulation should require that central clearing⁹⁷ if the sum of its anticipated benefits outweighs, or otherwise justifies, the sum of its anticipated costs.⁹⁸ This cost-benefit balancing also follows Kaldor-Hicks efficiency, the practical standard used by economists to assess the economic desirability of a project.⁹⁹ A project is Kaldor-Hicks efficient if its overall benefits exceed its overall costs, regardless of who bears the costs and who gets the benefits.¹⁰⁰

Subpart A next estimates the anticipated benefits, and subpart B then estimates the anticipated costs, of centrally clearing non-derivative financial contracts. Subpart C thereafter balances those benefits and costs. Per the restated theory, these estimates of benefits and costs are restricted to central clearing of standardized material non-derivative financial contracts that have at least one systemically important counterparty. The estimates also assume that CCPs used for that central clearing will be protected against concentrated counterparty risk the same way that CCPs used for central clearing of derivatives contracts are protected.

This Article does not, however, attempt to quantify all of the benefits and costs of centrally clearing non-derivative financial contracts. Instead, its cost-benefit balancing

⁹⁷ This logic follows a consequence-based inquiry (CBI) normative framework to determine when financial market changes should drive legal changes. *See* Steven L. Schwarcz, *Changing Law to Address Changing Markets: A Consequence-Based Inquiry*, 80 LAW & CONTEMPORARY PROBLEMS 163 (2017).

⁹⁸ *See supra* note 76. *Cf.* MAEVE P. CAREY, CONG. RES. SERV., R41974, COST-BENEFIT AND OTHER ANALYSIS REQUIREMENTS IN THE RULEMAKING PROCESS 1 (2014) (observing that a “proposed regulatory requirement is judged to pass the ‘cost-benefit test’ if the sum of its anticipated benefits outweighs, or otherwise justifies, the sum of its present and future costs in present value terms” and explaining that (“Cost-benefit analysis, in [the federal rulemaking] context, involves the systematic identification of all of the costs and benefits associated with a forthcoming regulation . . .”). *Cf.* WILLIAM F. FOX, UNDERSTANDING ADMINISTRATIVE LAW 177 (5th ed. 2012) (stating that “[each of] the different processes of analysis that sometimes fit[s] under the general umbrella of cost-benefit analysis . . . is an attempt to . . . get as much information and insight on a *proposed government action* as possible” (emphasis added)).

⁹⁹ ROBIN PAUL MALLOY, LAW IN A MARKET CONTEXT: AN INTRODUCTION TO MARKET CONCEPTS IN LEGAL REASONING 190 (2004).

¹⁰⁰ *Id.*

starts by taking as given that the benefits of centrally clearing *derivatives* contracts exceeds its costs.¹⁰¹ From that starting point, the cost-benefit balancing of centrally clearing non-derivative financial contracts turns on how those benefits and costs vary from those of central clearing derivatives contracts. If, for example, the benefits of centrally clearing non-derivative financial contracts are at least—and the costs of centrally clearing non-derivative financial contracts do not exceed—the respective benefits and costs of centrally clearing derivatives contracts, then central clearing of non-derivative financial contracts should satisfy a cost-benefit balancing.

A. Estimating the Benefits of Centrally Clearing Non-Derivative Financial Contracts

The primary benefit of centrally clearing non-derivative financial contracts—just like that of centrally clearing derivatives contracts—would be the reduction of systemic risk at the level of individual systemically important counterparties.¹⁰² Although the benefit of that risk reduction has not been estimated for centrally clearing derivatives contracts, it is almost certainly huge. The cost of the financial crisis has been estimated as exceeding \$22 trillion.¹⁰³ If it reduces the risk of another financial collapse by even ten

¹⁰¹ *Cf. supra* notes 84-93 and accompanying text (observing that regulators assume, without actually testing, that central clearing of derivatives contracts reduces overall systemic costs; and stating that because central clearing of derivatives contracts is so widespread, this Article takes that regulatory assumption as a starting point for analysis).

¹⁰² *See supra* note 12 and accompanying text. This cost-benefit analysis does not attempt to predict possible ways in which innovative new technologies, such as distributed ledger technology (DLT), might change bilateral clearing of financial contracts to reduce systemic risk. Diana Milanesi has been considering such possibilities and whether new technologies might ultimately replace or supplement the need for central clearing.

¹⁰³ Eleazar David Melendez, *Financial Crisis Cost Tops \$22 Trillion, GAO Says*, HUFFINGTON POST, Feb. 14, 2013, available at https://www.huffingtonpost.com/2013/02/14/financial-crisis-cost-gao_n_2687553.html. *Cf. FED. RESERVE BANK OF MINNEAPOLIS, THE MINNEAPOLIS PLAN TO END TOO BIG TO FAIL 2* (Nov. 16, 2016), <https://www.minneapolisfed.org/~media/files/publications/studies/endingtbf/the-minneapolis-plan-to-end-too-big-to-fail-2016.pdf> (observing that as a result of the financial crisis, “trillions of dollars in American wealth was destroyed”).

percent, centrally clearing derivatives contracts could save hundreds of billions of dollars, if not more.

Centrally clearing non-derivative financial contracts could reduce systemic risk by an amount roughly comparable to (and possibly more than) the reduction achieved by centrally clearing derivatives contracts. As previously explained, the aggregate counterparty exposure on non-derivative financial contracts greatly exceeds that on derivatives contracts.¹⁰⁴ The aggregate counterparty exposure on the set of non-derivative financial contracts on which this Article focuses (those with systemically important counterparties and that are standardized¹⁰⁵) might, or might not, also exceed the aggregate counterparty exposure on the set of derivatives contracts that are required to be centrally cleared (those that are standardized).¹⁰⁶ Assume, conservatively, that the exposures are merely comparable. Because those non-derivative financial contracts can be as systemically risky as derivatives contracts, central clearing of those contracts should reduce systemic costs by an order of magnitude corresponding to the hundreds-of-billions-of-dollars cost reduction achieved by centrally clearing derivatives contracts.¹⁰⁷

¹⁰⁴ See *supra* note 16 and accompanying text. The news media sometimes incorrectly suggest that the opposite is true, referencing the “notional amount” of derivatives outstanding globally (which is almost ten times as large as world GDP). See, e.g., <http://www.milkeninstitute.org/blog/view/580> (discussing the news media’s mistaken reliance on notional amount to measure the size of the derivatives market). The notional amount does not reflect the amount at risk on a derivative; it merely refers to the value of underlying assets specified in the derivatives contract. See, e.g., Apanard Prabha, Keith Savard, & Heather Wickramarachi, *Deriving the Economic Impact of Derivatives*, Milken Institute (Mar. 2014), available at <http://assets1b.milkeninstitute.org/assets/Publication/ResearchReport/PDF/Derivatives-Report.pdf> (“notional amounts outstanding, though a rough measure of derivatives activity, do not represent . . . generally, the amount of risk”). The more appropriate measure of risk exposure—which this Article uses as a basis for comparison—is gross market value. See Monetary and Economic Department, Bank for International Settlements, *supra* note 16 (explaining that gross market value “represents the maximum loss that market participants would incur if all counterparties failed to meet their contractual payments and the contracts could be replaced at current market prices”).

¹⁰⁵ See text accompanying notes 100-100, *supra*.

¹⁰⁶ See Part I.B, *supra*.

¹⁰⁷ See *supra* notes 102-103 and accompanying text. Cf. Baklanova, Dalton, & Tompaidis, *supra* note 77, at 6 (estimating the benefits of expanding the central clearing

The foregoing comparison of systemic cost reduction implicitly presumes that central clearing would reduce systemic risk for non-derivative financial contracts as effectively as it would reduce systemic risk for derivatives contracts. Some might argue, however, that central clearing would reduce systemic risk more effectively for derivatives contracts, which are more susceptible to multilateral netting.¹⁰⁸ Multilateral netting refers to a CCP's ability to net offsetting payment obligations among its clearing members¹⁰⁹:

Multilateral netting allows for the aggregate offset of positions and the termination of economically redundant obligations. Multilateral netting offsets obligations [among] multiple parties as opposed to bilateral netting, which offsets obligations between only two counterparties.¹¹⁰

The distinction between bilateral and multilateral netting arises from basic setoff law. Parties generally have the right to set off, or “net,” mutually offsetting matured obligations.¹¹¹ For example, if Party A owes \$1,000,000 to Party B and Party B owes \$250,000 to Party A, then Party A owes only \$750,000 to Party B on a net basis, after setoff.¹¹² Bilateral setoff refers to this type of ordinary setoff between two parties.

In contrast, multilateral netting refers to setoff among multiple parties. Setoff law does not normally permit multilateral netting because setoff rights require precise mutuality of obligations. Central clearing, however, creates the equivalent of mutuality by virtue of novation—in which the CCP legally substitutes its credit for that of the contracting parties, making it the primary counterparty on both sides of the contract.¹¹³

of repo transactions beyond dealers as including—merely for that one type of non-derivative financial contract—a \$53.7 billion reduction in net exposure).

¹⁰⁸ Two reviewers of this Article made that argument.

¹⁰⁹ For an explanation of CCP clearing members and their responsibilities, *see infra* notes 160-164 and accompanying notes.

¹¹⁰ *See, e.g.,* Ivana Ruffini, *Central Clearing: Risks and Customer Protections*, 4Q/2015 FRB CHICAGO ECONOMIC PERSPECTIVES 90, 91.

¹¹¹ Stephen L. Sepinuck, *The Problems with Setoff: A Proposed Legislative Solution*, 30 WM. & MARY L. REV. 51, 54 (1988).

¹¹² Used as a noun, the term is a “setoff”; used as a verb, the expression is to “set off.”

¹¹³ *See supra* note 8 and accompanying text.

Thus, if clearing member A owes clearing member B \$1,000,000 and clearing member B owes clearing member C \$1,000,000, clearing member B's offsetting obligations will be set off (i.e., netted) and clearing member A will simply owe clearing member C the \$1,000,000.

The argument that central clearing would reduce systemic risk more effectively for derivatives contracts than for non-derivative financial contracts depends, in the first instance, on the former being more susceptible to multilateral netting.¹¹⁴ Derivatives contracts are indeed likely to be more susceptible to multilateral netting because relatively more counterparties on derivatives contracts would be CCP clearing members.¹¹⁵ That reflects the current reality that derivatives-contract counterparties tend to be highly concentrated.¹¹⁶

Ultimately, however, the argument that central clearing would reduce systemic risk more effectively for derivatives contracts than for non-derivative financial contracts assumes that multilateral netting reduces systemic risk.¹¹⁷ The accuracy of that assumption has not been rigorously tested. Some question that assumption, arguing that while multilateral netting can reduce credit risk, it can increase systemic risk.¹¹⁸ Professor

¹¹⁴ See *supra* note 108 and accompanying text.

¹¹⁵ See *infra* notes 172-173 and accompanying text.

¹¹⁶ See, e.g., *Derivatives and Collateral*, *supra* note 32, at 706 (discussing the concentration of derivatives markets). Most of the Options Clearing Corporation's clearing members, for example, are well-known financial institutions like Deutsche Bank Securities, Inc., Goldman Sachs & Co. LLC, Wells Fargo Securities, LLC, and Citigroup Global Markets Inc. See OPTIONS CLEARING CORPORATION, 2016 ANNUAL REPORT 49 (2017), <https://www.theocc.com/components/docs/about/annual-reports/occ-2016-annual-report.pdf>.

¹¹⁷ Cf. Ruffini, *supra* note 110 (stating that "multilateral netting of obligations[] often result[s] in a reduction of counterparty credit risk and the liquidity risk borne by" clearing members); INTERNATIONAL MONETARY FUND, *supra* note 84, at 6 (stating that "Multilateral compression and tear-up operations eliminate redundant contracts and reduce counterparty risk, and shorten and simplify systemic interconnections").

¹¹⁸ See, e.g., Bank for International Settlements, Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten Countries (the "Lamfalussy Report") (Nov. 1990).

Mokal further contends that multilateral netting encourages greater leverage and thus greater risk, redistributes risk rather than diminishes it, weakens lending standards by worsening financial agency and adverse selection costs, increases market volatility because net exposures are vulnerable to movements that are multiples of the changes in the underlying obligations, and spreads the effects of a systemic shock.¹¹⁹ For the reasons discussed in Appendix 1, the author also personally questions whether multilateral netting reduces systemic risk.¹²⁰

This Article does not attempt, however to definitively resolve whether multilateral netting reduces systemic risk.¹²¹ If multilateral netting does not reduce that risk, the benefits of centrally clearing non-derivative financial contracts would closely resemble the benefits of centrally clearing derivatives contracts. Central clearing of non-derivative financial contracts would then more clearly satisfy a cost-benefit balancing.

Centrally clearing non-derivative financial contracts could also provide benefits beyond reducing systemic risk. For example,¹²² it could reduce transaction costs by enabling CCPs to net offsetting contractual obligations, thereby more efficiently managing counterparty risk.¹²³ It could also provide an indirect political benefit: by

¹¹⁹ Mokal, *supra* note 56, at 19, 59–62.

¹²⁰ See Appendix I, *infra*.

¹²¹ Multilateral netting more clearly increases CCP operational efficiencies. *Cf.* Froukelien Wendt, “Central Counterparties: Addressing their Too Important to Fail Nature,” IMF Working Paper No. WP/15/21, at 4 (Jan 2015), available at <https://www.imf.org/external/pubs/ft/wp/2015/wp1521.pdf> (observing that “multilateral netting . . . reduc[es] the total credit exposure in the market as well as the number of transactions that need to be settled, which results in operational efficiencies”).

¹²² Another possible benefit of centrally clearing non-derivative financial contracts is that it might increase transparency. *Cf.* Hull, *infra* note 135 (arguing that a benefit of centrally clearing nonstandard derivatives contracts would be increasing transparency).

¹²³ See *e.g.*, Cyril Monnet, *Let’s Make It Clear: How Central Counterparties Save(d) the Day*, Philadelphia Fed. Reserve Bk. 5 (2010), available at http://www.philadelphiafed.org/research-and-data/publications/business-review/2010/q1/brq110_central-counterparties.pdf (“[T]he CCP works best if contracts are completely standardized . . . Netting is limited if contracts are only imperfectly substitutable . . .”). *Cf.* Mokal, *supra* note 56, at 58–59 (observing that netting allows CCP members to collateralize only their net, rather than gross, exposures (enabling

shifting counterparty risk from numerous systemically important counterparties to a limited number of CCPs, it would facilitate the so-called single-point-of-entry (“SPOE”) resolution strategy currently pursued by regulators.¹²⁴ This strategy is artificially dependent, among other things, on government receivership and operation of a troubled systemically important firm.¹²⁵ Concentrating risk in CCPs could reduce the number of government receiverships that are needed under that strategy—a benefit that could help to offset the potential moral hazard cost of that risk concentration.¹²⁶

B. Estimating the Costs of Centrally Clearing Non-Derivative Financial Contracts

Although the benefits of centrally clearing non-derivative financial contracts could be huge, such clearing would generate at least two types of costs¹²⁷: the transaction costs of creating and operating the CCPs, and the possible systemic costs of concentrating counterparty risk in the CCPs. Consider each in turn.

1. *Transaction costs.* The transaction costs of creating and operating CCPs for centrally clearing non-derivative financial contracts would not appear to be very different from the transaction costs of existing CCPs. An existing CCP whose clearing members include the relevant counterparties could even clear both types of contracts.

A possible difference in operating costs might result from non-derivative financial contracts being less standardized than derivative contracts. Standardization reduces transaction costs because CCPs can much more easily net offsetting obligations on

members to stretch collateral to cover a greater volume of transactions), enables a more efficient use of regulatory capital, and enhances liquidity by allowing flexibility across legal categories and asset types).

¹²⁴ This argument was made by Professor Robert Bliss of Wake Forest University at the Federal Reserve Bank of Chicago workshop, *supra* note 14.

¹²⁵ John Crawford, ‘*Single Point of Entry*’: *The Promise and Limits of the Latest Cure for Bailouts*, 109 NW. U. L. REV. ONLINE 103, 107 (2014).

¹²⁶ *Cf. infra* notes 143-150 and accompanying text (discussing the TBTF problem).

¹²⁷ *See supra* note 77 and accompanying text.

standardized contracts than on non-standardized contracts.¹²⁸ This cost differential might become insignificant, however, because non-derivative financial contracts increasingly are being documented on a standardized basis, like derivative contracts.¹²⁹ Indeed, many non-derivative financial contracts are being documented on standard form contracts developed by the International Swaps and Derivatives Association (ISDA) for documenting derivatives transactions. This is being done to gain the advantage of bankruptcy law’s “safe harbor” exemptions for derivatives contracts.¹³⁰ Loan agreements and virtually any other type of financial contract can be documented as a derivatives contract.¹³¹ Some textbooks are even openly encouraging parties to design financing contracts as derivatives contracts, in order to take advantage of that safe harbor.¹³²

Any cost differential could also be managed. The laws requiring central clearing of derivatives contracts control transaction costs by limiting such clearing to standardized

¹²⁸ To understand why, consider how netting works. Central clearing practice allows a CCP to net offsetting obligations even if they are between different members of the CCP. For example, a CCP can net the obligation of member X to deliver a security to the CCP against the CCP’s concurrent obligation to deliver that same security to member Y. *See* International Capital Markets Association, *What does a CCP do? What are the pros and cons?* (2017), available at <http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/repo-and-collateral-markets/frequently-asked-questions-on-repo/27-what-does-a-ccp-do-what-are-the-pros-and-cons/> (describing the process of netting for CCPs). In contrast, “[n]onstandard contracts cannot be netted, since each one’s cash flow characteristics are different.” INTERNATIONAL MONETARY FUND, *supra* note 84, at 6.

¹²⁹ Another reason the cost differential might be insignificant is that a significant portion of derivatives contracts, referred to as over-the-counter (“OTC”) derivatives, are themselves not standardized. Prior to post-crisis financial regulation, most derivatives were OTC. *Levitin, supra* note 80 at 449. Even after the financial crisis, the notional amount of OTC derivatives has been estimated as \$693 trillion worldwide. Monetary and Economic Department, Bank for International Settlement, “Statistical release OTC derivatives statistics at end-June 2013,” at 2 (Nov. 2013), available at http://www.bis.org/publ/otc_hy1311.pdf.

¹³⁰ Steven L. Schwarcz & Ori Sharon, *The Bankruptcy-Law Safe Harbor for Derivatives: A Path-Dependence Analysis*, 71 WASH. & LEE L. REV. 1715, 1752 (2014).

¹³¹ *Id.* at 1752.

¹³² *See id.* *See also* Franklin R. Edwards & Edward R. Morrison, *Derivatives and the Bankruptcy Code: Why the Special Treatment?*, 22 YALE J. REG. 91, 121 (2005); Bryan G. Faubus, *Narrowing the Bankruptcy Safe Harbor for Derivatives to Combat Systemic Risk*, 59 DUKE L.J. 801, 828–29 (2010).

derivatives contracts.¹³³ Any laws requiring central clearing of non-derivative financial contracts could likewise—and this Article has proposed that any such laws should¹³⁴—control transaction costs by limiting such clearing to standardized¹³⁵ non-derivative financial contracts. Appendix 2 to this Article discusses standardized non-derivative financial contracts.

The fact that CCPs are often associated with derivatives and commodities exchanges,¹³⁶ whereas non-derivative financial contracts are less likely to depend on exchanges,¹³⁷ might appear to create another possible transaction-cost differential. In recent years, however, many CCPs have decoupled their exchange affiliation and started operating as independent companies.¹³⁸ This suggests that their profitability, which is dependent on controlling transaction costs, is not necessarily tied to particular exchanges.

¹³³ Cf. *supra* note 88 and accompanying text (observing that regulators have partly limited transaction costs by restricting central clearing only to standardized derivatives contracts). See also *Dodd Frank Act*, COMMODITIES FUTURES TRADING COMMISSION, available at <http://www.cftc.gov/lawregulation/doddfrankact/index.htm> (last visited Oct. 17, 2014) (“Standardized derivatives will be required to trade on open platforms and be submitted for clearing to central counterparties.”); *Global Financial Stability Report*, *supra* note 128, at 12; *Understanding Derivatives: Markets and Infrastructure*, CHICAGO FED 31, available at https://www.chicagofed.org/digital_assets/publications/understanding_derivatives/understanding_derivatives_chapter_3_over_the_counter_derivatives.pdf.

¹³⁴ See text accompanying notes 93-94, *supra*.

¹³⁵ This Article does not examine whether non-standardized financial contracts should be centrally cleared. Cf. John Hull, *OTC Derivatives and Central Clearing: Can All Transactions Be Cleared?*, at 7 (April 2010), available at https://www.moody.com/microsites/crc2010/papers/hull_otc.pdf (advocating that all derivatives contracts—especially nonstandard OTC contracts, because those are the most likely to be used for large speculative positions that can increase systemic risk—be centrally cleared). Hull argues that the difficulties of centrally clearing nonstandard derivatives contracts would be outweighed by the benefits, which include reducing counterparty risk and increasing transparency. See *id.* at 9–10. He also says that nonstandard contracts could be netted if they could be valued daily. *Id.*

¹³⁶ See *supra* note 7 and accompanying text.

¹³⁷ A loan agreement, for example, is rarely traded on an exchange.

¹³⁸ See *infra* note 161 (observing that many CCPs have now become independent companies).

2. *Systemic costs.* The primary costs of centrally clearing non-derivative financial contracts would be, paradoxically, potentially increasing systemic costs: by concentrating counterparty risk in CCPs, central clearing makes the CCPs even more systemically important than the original counterparties.¹³⁹ In other words, central clearing would reduce the systemic costs of individual systemically important counterparties but increase the systemic costs of CCPs. The question is whether it reduces the *overall* systemic costs.

Even in the derivatives context, there is controversy whether central clearing reduces overall systemic costs.¹⁴⁰ Regulators assume, however, that it does reduce those overall costs.¹⁴¹ This subpart's focus is therefore on whether central clearing of non-derivative financial contracts would change that overall systemic cost balance.

Central clearing of non-derivative financial contracts would reduce the systemic costs of individual systemically important counterparties the same way—by having CCPs assume the counterparty risk—that central clearing of derivatives contracts reduces those systemic costs. Therefore, if those CCPs are protected against risk concentration at least as well as CCPs that centrally clear derivatives contracts are protected, central clearing of non-derivative financial contracts should not change that overall cost balance.¹⁴² Part IV of the Article explains how those CCPs could be equally well protected.

¹³⁹ Cf. International Capital Markets Association, *supra* note 128 (describing the primary “drawback” of centrally clearing derivatives contracts as “concentrat[ing]” risk in CCPs, “which will themselves become potential sources of systemic risk”). Their size, their interconnectedness with clearing members, and their lack of substitutability make CCPs highly systemically risky. Cf. text accompanying note 55, *supra* (discussing size, interconnectedness, and substitutability as the three main determinants of systemic risk). Central clearing might also increase the correlation of risks among systemically important firms. The financial crisis intensified when numerous systemically important firms began to fail because of their correlated investments (in MBS).

¹⁴⁰ See *supra* notes 84-92 and accompanying text.

¹⁴¹ See *id.*

¹⁴² Central clearing of non-derivative financial contracts might even improve the overall cost balance by enabling CCPs to clear a larger number of contracts. Cf. Rodney Garratt & Peter Zimmerman, *Does Central Clearing Reduce Counterparty Risk in Realistic Financial Networks?*, Federal Reserve Bank of New York Staff Report No. 717, at 1

Centrally clearing non-derivative financial contracts might, however, increase the perception of systemic costs tied to the so-called “too big to fail” (TBTF) problem—that systemically important financial firms might engage in excessive risk-taking because they would profit from success and be bailed out by the government to avoid a failure.¹⁴³ There is an increasing worldwide regulatory focus on trying to end the TBTF problem.¹⁴⁴

Critics have argued, in the derivatives context, that CCPs are the “ultimate” too big to fail organizations.¹⁴⁵ Because a CCP is “a central node in the financial system,” and thus highly interconnected with other financial institutions,¹⁴⁶ its failure could have effects similar to what was feared could happen if AIG had failed during the financial crisis¹⁴⁷—what has been described as “staring into the abyss.”¹⁴⁸ For example, a CCP’s

(Mar. 2015) (arguing that a CCP’s netting is unlikely to be valuable when the network relies on only a few key nodes).

¹⁴³ This is primarily a problem of moral hazard; persons protected from the negative consequences of their risky actions will be tempted to take more risks. *See* Steven L. Schwarcz, *Too Big to Fool: Moral Hazard, Bailouts, and Corporate Responsibility*, 102 MINN. L. REV. 761 (2017) (analyzing the TBTF problem and the causes of excessive risk-taking).

¹⁴⁴ *Id.* (discussing regulatory efforts by the U.S. Federal Reserve and also by the Financial Stability Board (FSB), an organization established by the G20 nations to monitor and make recommendations about the global financial system).

¹⁴⁵ *See, e.g.*, Mark J. Roe, *Clearinghouse Overconfidence*, 101 CALIF. L. REV. 1641, 1692 n. 123 (2013) (collecting sources); Yadav, *supra* note 39, at 391 (challenging the “academic and policy consensus that clearinghouses adequately mitigate the risks of trading credit derivatives”); Iman Anabtawi & Steven L. Schwarcz, *Regulating Systemic Risk: Towards an Analytical Framework*, 86 NOTRE DAME L. REV. 1349, 1394–95 (2011) (observing that centralized clearing of derivatives would shift counterparty risk from individual counterparties to the CCP, thereby concentrating the risk).

¹⁴⁶ *Cf. supra* notes 55-56 and accompanying text (discussing interconnectedness as one of the three systemic risk factors).

¹⁴⁷ *See, e.g.*, Steven McNamara, *Financial Markets Uncertainty and The Rawlsian Argument for Central Counterparty Clearing of OTC Derivatives*, 28 NOTRE DAME J.L. ETHICS & PUB. POL’Y 259 (2014).

¹⁴⁸ Jeff Kearns & Robert Schmidt, *From Davos to Big Sur, Geithner Recounts Staring Into the Abyss*, BLOOMBERG, May 10, 2014, available at <http://www.bloomberg.com/news/2014-05-09/geithner-recounts-standing-at-big-sur-cliff-edge-as-crisis-grew.html>.

failure could suspend all or a portion of the market for derivatives transactions, causing systemic contagion including “firesales of collateral or derivatives contracts, exacerbating broad market volatility.”¹⁴⁹ The government would therefore almost certainly have to bail out a failing CCP. And the expectation of a bailout could foster moral hazard, incentivizing CCPs themselves to take greater risks.¹⁵⁰

Qualitatively, any such perception of systemic costs should be no different whether CCPs clear derivatives contracts or non-derivative financial contracts. Quantitatively, however, requiring non-derivative financial contracts to be centrally cleared would add to the volume of CCP clearing, thereby possibly increasing that perception. Such an increased perception would certainly represent a political cost. It unlikely represents an increase in actual systemic costs, however, because there is no real evidence that the TBTF problem increases risk-taking.¹⁵¹

C. Balancing Benefits and Costs

The analysis in subparts A and B indicates that—other than possible differences in the benefits of multilateral netting—the benefits and the costs of centrally clearing non-derivative financial contracts would roughly parallel those of centrally clearing derivatives contracts. Both types of contracts are standardized financial contracts that have systemically important counterparties.¹⁵² Although centrally clearing non-derivative financial contracts might increase the perception of systemic costs tied to the TBTF problem, any such increase would represent political, not actual, costs and thus should

¹⁴⁹ Darrell Duffie, *Resolution of Failing Central Counterparties*, Stanford University Graduate School of Business Research Paper No. 15-12 (Dec. 17, 2014), at 88, available at <https://ssrn.com/abstract=2558226> (arguing that a CCP’s “fail[ure] to meet its obligations to other systemically [important] clearing members” could cause that contagion).

¹⁵⁰ *Cf.* Levitin, *supra* note 80 (arguing that, without proper regulation, CCPs may engage in underpriced risk-taking, thereby increasing systemic risk).

¹⁵¹ *Too Big to Fool*, *supra* note 143, at 764-69.

¹⁵² Derivatives contracts are at least likely to have, and the non-derivative financial contracts analyzed in this Article are limited to those that have, at least one systemically important counterparty.

not strictly be included in a cost-benefit balancing.¹⁵³ Accordingly, if the benefits of centrally clearing derivatives contracts exceed its costs (which, as discussed, is an untested premise¹⁵⁴), then—again subject to possible differences in the benefits of multilateral netting—the benefits of centrally clearing non-derivative financial contracts might also exceed its costs.

Because its cost-benefit balancing is based on rough approximations, an untested premise, and possible differences in the benefits of multilateral netting, this Article cannot—and does not purport to—conclude that regulation should require central clearing of non-derivative financial contracts. Nonetheless, the Article’s approach to cost-benefit balancing should provide a useful way of thinking about whether regulators should impose that central clearing requirement.¹⁵⁵

In the United States, there may be an additional way to think about the value of requiring central clearing for non-derivative financial contracts. Recall that Congress has viewed systemic risk regulation so important as to exempt it from traditional cost-benefit analysis.¹⁵⁶ If regulation requiring central clearing for non-derivative financial contracts follows that mandate, the only cost-benefit question would be whether the regulation reduces overall systemic costs, i.e., whether its reduction of systemic costs of individual systemically important counterparties outweighs the increase of systemic costs caused by

¹⁵³ Cf. C.W., *The Economist Explains: Why Doing a Cost-benefit Analysis is Harder than it Looks*, ECONOMIST (Apr. 24, 2014, emphasis added) (“The aim [of a cost-benefit analysis] is to provide an impartial, evidence-based judgment of the costs and benefits of a particular policy or project, *without regard to its political ramifications.*”).

¹⁵⁴ See text accompanying note 91, *supra*. Recall that this Article builds on the widespread reality of the central clearing requirement for derivatives contracts as an indicator that such clearing may well reduce overall systemic risk, without necessarily agreeing whether it reduces that overall risk. See text accompanying note 93, *supra*.

¹⁵⁵ Even detailed empirical research by the U.S. Office of Financial Research has not yet provided a more useful way of thinking about the value of requiring central clearing. Cf. Baklanova, Dalton, & Tompaidis, *supra* note 77, at 7 (reaching a non-committal conclusion, itself based on “[s]everal caveats,” as to whether “the potential benefits outweigh the costs” for expanding central clearing of repo transactions to transactions involving nondealers).

¹⁵⁶ See *supra* note 85 and accompanying text.

concentrating CCP counterparty risk. By ignoring transaction costs, that affords an even easier cost-benefit balancing in favor of regulation requiring central clearing for non-derivative financial contracts.

IV. ADAPTING AND ENHANCING CENTRAL COUNTERPARTY RISK PROTECTION

The foregoing cost-benefit analysis presupposes that CCPs used for centrally clearing non-derivative financial contracts would be protected against risk concentration at least as well as are CCPs used for centrally clearing derivatives contracts.¹⁵⁷ This Part IV explains why those CCPs could be equally well protected. To that end, subpart A examines how current protections could be adapted to CCPs used to clear non-derivative financial contracts. Thereafter, subpart B examines how those protections could be enhanced, which would make central clearing of non-derivative financial contracts even more likely to satisfy a cost-benefit balancing.

A. Adapting Existing Protections

All of the current protections against CCP risk concentration either would apply, or could be adapted, to CCPs used to clear non-derivative financial contracts.¹⁵⁸ CCPs currently employ various protections against risk concentration, and thus against the risk of default.¹⁵⁹ To minimize these risks, CCPs typically grant central clearing services to a relatively small number of firms, normally limited to well-capitalized banks and other large financial institutions that become “clearing members” of the CCP.¹⁶⁰ By becoming clearing

¹⁵⁷ See text accompanying note 142, *supra*.

¹⁵⁸ Although the textual discussion primarily addresses U.S.-based CCPs, the European Union has similar protections against CCP risk concentration. See Bas Zebregs & Victor de Serière, *Efforts to Strengthen the Clearing and Settlement Framework of the Capital Markets Union*, in *CAPITAL MARKETS UNION IN EUROPE* (Guido Ferrarini, Emiliós Avgouleas, & Danny Busch, eds. 2018).

¹⁵⁹ NORMAN, *supra* note 8, at 10 (“Because a CCP represents a single point of failure, it needs to be bullet proof.”). Cf. *supra* note 10 and accompanying text (observing that counterparty risk is sometimes called default risk).

¹⁶⁰ Levitin, *supra* note 80, at 451 (describing the various risk management tools available to CCPs). See also *Manage Your Risk How Clearing Works*, available at https://www.theice.com/publicdocs/How_Clearing_Works.pdf (“clearing houses have in

members, firms assume various responsibilities that help to support the CCP's financial integrity.¹⁶¹ These include agreeing to maintain sufficient collateral to reimburse the CCP for payment of the clearing member's individual counterparty obligations,¹⁶² to contribute (on a pro rata basis with the other clearing members) to a loss-absorbency fund that can be used to cover the CCP's losses in case a clearing member fails to so reimburse the CCP,¹⁶³ and to pay capital assessments into the CCP as needed to keep it solvent.¹⁶⁴

To further minimize default risk,¹⁶⁵ a CCP may buy protection to hedge its payment obligations.¹⁶⁶ To cover a worst-case scenario where these measures are insufficient and

place a comprehensive set of procedures and a robust risk management framework that includes: real-time position monitoring, intraday mark to market margining, substantial default resources, rigorous stress testing, comprehensive oversight, extensive transparency.”). Firms other than clearing members can only get access to the derivatives market through clearing members. NORMAN, *supra* note 8, at 10.

¹⁶¹ Originally, CCPs were owned by their clearing members, but many CCPs have now demutualized and become part of publicly traded companies. CCPs nonetheless continue to enforce strict membership responsibilities to help support their own financial integrity. Ruffini, *supra* note 90, at 91.

¹⁶² This can help a CCP avoid illiquidity, especially by requiring clearing members to post variation margin on a daily basis depending on changes in the counterparties' positions. Sergei A. Davydenko, *Insolvency, Illiquidity, and the Risk of Default*, available at tinbergen.nl/wp-content/uploads/2013/04/Liquidity.pdf

¹⁶³ This creates an incentive for each clearing member to monitor the creditworthiness of the other clearing members. *Cf.* Cox & Steigerwald, *supra* note 17, at 11 (arguing that “the mutualized risk characteristic of the CCP” incentivizes clearing members to take active steps to try to reduce the CCP's risk).

¹⁶⁴ NORMAN, *supra* note 8, at 10. John Fennell of The Options Clearing Corporation observed at a Federal Reserve conference attended by the author that, in his experience, clearing members are ordinarily required to pre-fund one assessment and are subject to one additional assessment, after which they could choose to resign from membership.

¹⁶⁵ Through multilateral netting, a CCP normally also has the right to periodically net and set off its clearing members' aggregate counterparty rights and liabilities, so the CCP is only required to make a payment if there is a net aggregate liability. The extent to which this actually reduces risk—or at least, systemic risk—is somewhat uncertain. *See supra* note 119 and accompanying text.

¹⁶⁶ For example, if the Chicago Mercantile Exchange's CCP, CME Clearing Services, assumes responsibility to clear a CDS contract that covers the risk of a commodities trade, CME Clearing Services may itself choose to hedge that risk by purchasing protection under a corresponding CDS contract.

the CCP faces insolvency or illiquidity,¹⁶⁷ at least U.S. law gives CCPs that are classified as financial market utilities (“FMU”s) access to central bank emergency funding.¹⁶⁸

Many of these protections would apply to CCPs equally whether they clear derivatives contracts or non-derivative financial contracts. For example, the distinction between those contracts is irrelevant to a CCP’s ability to buy protection to hedge its potential obligations to pay a net aggregate liability.¹⁶⁹ Similarly, that distinction is irrelevant to a central bank’s decision to grant CCPs access to central bank emergency funding.¹⁷⁰

The distinction between those contracts might be relevant, however, to certain of the protections against CCP risk concentration. For example, recall that CCPs used to clear derivatives contracts typically grant central clearing services to only a relatively small number of well-capitalized large financial institutions, which assume various responsibilities to help support the CCP’s financial integrity.¹⁷¹ Limiting CCP clearing membership in that way does not appear to impede central clearing of standardized derivatives contracts because most parties to such contracts are in fact well-capitalized

¹⁶⁷ Insolvency means that the CCP’s liabilities exceed the value of its assets whereas illiquidity means that the CCP does not have enough cash or near-cash assets to pay its current liabilities as they come due. A CCP thus can be illiquid without being insolvent, and vice versa. CCP illiquidity is the more common and pressing issue because an illiquid CCP cannot pay all of its counterparty obligations. Insolvency is often difficult to determine because asset valuation in a financially distressed situation is often hotly contested, including whether to value the assets at their going-concern or their liquidation value. *See, e.g.,* Matthew C. Klein, *Illiquid, Insolvent, What’s the Difference?*, FINAN. TIMES, Sep. 30, 2014.

¹⁶⁸ Title VIII of the Dodd-Frank Act gives the Federal Reserve power to provide discount-window lending, a form of liquidity, to FMUs “in unusual or exigent circumstances.”

¹⁶⁹ *Cf. supra* note 166 and accompanying text (discussing the purchase of hedging protection).

¹⁷⁰ *Cf. supra* notes 167-168 and accompanying text (discussing central bank emergency funding).

¹⁷¹ *See supra* notes 160-164 and accompanying text.

large financial institutions.¹⁷² That limitation, however, might impede central clearing of non-derivative financial contracts with smaller or less well-capitalized firms as counterparties.¹⁷³ For CCPs used to clear those non-derivative financial contracts, these “member-provided” protections would need to be adapted.

Fortuitously, a recent study by the U.S. Office of Financial Research suggests how to adapt member-provided protections to smaller or less well-capitalized firms as counterparties. The study considers whether central clearing of repo transactions,¹⁷⁴ which currently occurs for transactions between dealers, should be expanded to also cover transactions between dealers and nondealers.¹⁷⁵ It assumes that only the dealers are CCP clearing members.¹⁷⁶ It also recognizes, as does this Article, that member-provided protections are needed to help offset the CCPs’ increased risk concentration.¹⁷⁷ The study suggests that, to “ensure that [a] CCP could withstand potential losses from [nondealer] defaults,” its clearing members should make “additional funding contributions” to the CCP.¹⁷⁸ That same approach—requiring the CCP clearing members to make any additional funding needed to support the CCP’s financial integrity—could also be used to protect CCPs that clear non-derivative financial contracts.¹⁷⁹

¹⁷² Cf. OFFICE OF THE COMPTROLLER OF THE CURRENCY, QUARTERLY REPORT ON BANK TRADING AND DERIVATIVES ACTIVITY, THIRD QUARTER 2016, at 3 (reporting that “A small group of large financial institutions continues to dominate derivative activity in the U.S. commercial banking system.”).

¹⁷³ For example, a borrower on a loan agreement could be a medium-sized company, or a large company that is less well-capitalized than a financial institution. The minimum-potential-payment-obligation limitation may well exclude the need to centrally clear smaller loans. See *supra* note 94 and accompanying text.

¹⁷⁴ For an explanation of repo transactions, see text accompanying note 71, *supra*.

¹⁷⁵ See Baklanova, Dalton, & Tompaidis, *supra* note 77.

¹⁷⁶ *Id.* at 3 (observing that “[e]xpanding access to repo CCPs would involve centrally clearing bilateral transactions between dealers, who are members of CCPs, and their clients (nondealers), who are not members”).

¹⁷⁷ *Id.* (observing that if “a repo CCP were expanded to process repo transactions involving nondealers, the exposures of the CCP would increase”).

¹⁷⁸ *Id.*

¹⁷⁹ The Office of Financial Research study uses a model in which “dealers would clear and guarantee transactions with the CCP on behalf of their [nondealer] clients.” See *id.* at

B. Enhancing the Protections

Another question is whether the protections against CCP risk concentration could be enhanced. From the standpoint of enhancing protection, nothing appears to distinguish CCPs used to clear derivatives contracts from CCPs used to clear non-derivative financial contracts. However, because centrally clearing non-derivative financial contracts would greatly expand the use of CCPs, regulators might consider more proactively protecting them—regardless of which contracts they clear.

Ring-fencing represents at least one way to more proactively protect CCPs. In this context, ring-fencing means regulation that protects the CCP's assets and operations and minimizes its internal and affiliate risks.¹⁸⁰ Because it is costly, ring-fencing is most applicable to protect monopoly or semi-monopoly entities, which have few if any substitutes, that provide essential public services; thus, it is commonly used to protect public utilities that produce and disseminate electric energy.¹⁸¹ This is especially valuable where the utility is part of a holding company or other corporate structure that involves non-utility risk, such that insulation of the utility from that risk helps to assure unimpaired continuation of the public services.¹⁸²

CCPs, like public utilities, provide essential public services—in the case of CCPs, by (arguably) reducing systemic risk and thus ensuring the ongoing operation of the financial system. Also like public utilities, CCPs have few if any substitutes¹⁸³; indeed, they are often best situated to perform clearing services.¹⁸⁴ Furthermore, CCPs are often

5. The discussion above assumes that CCP clearing of non-derivative financial contracts follows that model.

¹⁸⁰ Cf. Steven L. Schwarcz, *Ring-Fencing*, 87 S. CAL. L. REV. 69, 81-82 (2013) (summarizing the uses of ring-fencing).

¹⁸¹ *Id.* at 105-06.

¹⁸² *Id.* at 74.

¹⁸³ Cox & Steigerwald, *supra* note 17, at 14 (observing that “there are few substitutes for most systemically important CCPs”).

¹⁸⁴ See, e.g., FIN. STABILITY OVERSIGHT COUNCIL, at 157, 160, 174 (2012).

part of a corporate structure that involves non-CCP risk. Ring-fencing would be especially valuable in that last context.

For example, ICE Clear Credit, a CCP that provides central counterparty clearing services for CDS contracts, is an indirect subsidiary of Intercontinental Exchange, Inc.¹⁸⁵ Intercontinental Exchange, Inc. engages in an aggressive acquisition strategy¹⁸⁶ that has caused it to incur significant debt,¹⁸⁷ and “[m]any aspects of [its] business [also] involve substantial risks of liability.”¹⁸⁸ Ring-fencing ICE Clear Credit would help to protect it from its parent company’s financial and operating risks, thereby assuring continued performance of the CCP’s clearing services even if the parent fails.¹⁸⁹

Using ring-fencing to more proactively protect CCPs would reduce systemic costs but increase transaction costs. If the reduction of systemic costs is greater than the increase in transaction costs, ring-fencing would make central clearing of non-derivative financial contracts even more likely to satisfy a cost-benefit balancing.

V. JURISPRUDENTIAL PERSPECTIVES

¹⁸⁵ *Id.* at 172.

¹⁸⁶ *See* Intercontinental Exchange, Inc. 2016 Annual Report, at 29, available at <http://ir.theice.com/~media/Files/I/Ice-IR/annual-reports/2016/2016-annual-report.pdf> (“We may be very acquisitive.”).

¹⁸⁷ *See id.* at 31 (“Following our acquisition of NYSE and Interactive Data, we have a significant amount of indebtedness outstanding on a consolidated basis.”).

¹⁸⁸ *See id.* at 33 (“Many aspects of our business . . . involve substantial risks of liability. . . . For example, dissatisfied market participants that have traded on our electronic platform . . . may make claims regarding the quality of trade execution, or allege improperly confirmed or settled trades, abusive trading practices, security and confidentiality breaches, mismanagement or even fraud against us or our participants. . . . An adverse resolution of any lawsuit or claim against us may require us to pay substantial damages . . .”).

¹⁸⁹ As another example, CME Clearing, a CCP that clears the vast majority of the derivatives contracts for U.S. futures, options on futures, and commodity options, is an unincorporated division of the Chicago Mercantile Exchange. FIN. STABILITY OVERSIGHT COUNCIL, *supra* note 184, at 157. Ring-fencing CME Clearing could help to insulate it from the exchange-related risks, thereby assuring unimpaired continuation of its clearing services even if the exchange fails.

This Article has analyzed whether regulators should expand the central clearing requirement to include non-derivative financial contracts. The very idea that regulators should require financial institutions to centrally clear their financial contracts—whether derivatives or non-derivative contracts—raises fundamental questions about the justification for financial regulation. Analytically, the Article so far has utilized the standard justification: that financial regulation is justified if its benefits exceed its costs.¹⁹⁰ This Part V examines that justification in more depth. To that end, subpart A examines whether regulators should mandate how financial institutions control their risk. Subpart B then examines whether regulators should require financial institutions to mutualize risk.

A. Should Regulators Mandate How Financial Institutions Control their Risk?

The standard justification for financial regulation presents a puzzle, at least when applied to risk-taking by sophisticated financial institutions: Why would the benefits of financial regulation ever exceed its costs? In principle, those institutions should know best how to control their own risk. To the extent they are protecting their investors, they also have incentives to control that risk. For these reasons, bank regulation “rarely mandates a specific way [for a financial institution] to mitigate risk, i.e., whether to take out insurance or take assets as collateral, etc.”¹⁹¹

The primary goal of financial regulation, however, should be to correct market failures.¹⁹² Regulation that corrects a market failure might well provide benefits that exceed the regulation’s costs. Risk-taking by sophisticated financial institutions can be

¹⁹⁰ See *supra* notes 76 & 83 and accompanying text.

¹⁹¹ Peter O. Muelbert, *Managing Risk in the Financial System*, in THE OXFORD HANDBOOK OF FINANCIAL REGULATION 395 (Niamh Moloney, Eilis Ferran, & Jennifer Payne, eds. 2015).

¹⁹² See, e.g., PAUL A. SAMUELSON & WILLIAM D. NORDHAUS, ECONOMICS 756 (15th ed. 1995) (making that observation); DAVID GOWLAND, THE REGULATION OF FINANCIAL MARKETS IN THE 1990S 21 (1990) (characterizing regulating markets to correct market failure as the “public interest theory”).

subject to market failures, most typically evidenced by externalities.¹⁹³ For example, government deposit insurance is commonly seen as distorting a deposit-taking bank's control of risk. Such insurance increases risk-taking because, if the bank fails, much of the cost of its failure would be externalized onto the government and taxpayers.¹⁹⁴

To help control that risk-taking, regulators commonly impose capital requirements on banks.¹⁹⁵ Most notably, the Basel capital accords require banks to maintain minimum equity (or “capital”) levels tied to their loan exposure, in order to protect them against unexpected losses.¹⁹⁶ The scholarship on controlling financial institution risk-taking is relatively limited, however¹⁹⁷ focusing mostly on bank capital regulation.¹⁹⁸ That scholarship has little relevance to this Article's focus on regulation requiring central clearing.¹⁹⁹

¹⁹³ Although economists often categorize externalities as a type of market failure, externalities more precisely are caused by market failures. Steven L. Schwarcz, *Regulating Shadows: Financial Regulation and Responsibility Failure*, 70 WASH. & LEE L. REV. 1781, 1799-1800 (2013).

¹⁹⁴ See, e.g., Robert L. Hetzel, *Should Increased Regulation of Bank Risk-Taking Come from Regulators or from the Market?*, 95 ECON. Q. 161, 166 (illustrating that “[a] financial safety net constituted by deposit insurance” can lead to market failure because “[i]n good times, bank shareholders do well, while in extremely bad times the insurance fund bails out the bank's depositors and debtholders”). Deposit insurance might also cause market failure by “worsen[ing] the incentives of depositors to monitor bank risk strategy.” GIANNI DE NICOLO ET AL., EXTERNALITIES AND MACROPRUDENTIAL POLICY 6 (2012).

¹⁹⁵ See, e.g., George J. Benston & George G. Kaufman, *The Appropriate Role of Bank Regulation*, 106 ECON. J. 688, 688, 694–96 (concluding that bank capital regulation is necessary “to reduce the negative externalities resulting from government-imposed deposit insurance”).

¹⁹⁶ Kern Alexander & Steven L. Schwarcz, *The Macroprudential Quandary: Unsystematic Efforts to Reform Financial Regulation*, in RECONCEPTUALISING GLOBAL FINANCE AND ITS REGULATION 127 (Ross Buckley et al., eds.) (2016).

¹⁹⁷ Cf. GAZI ISHAK KARA & S. MEHMET OZSOY, BANK REGULATION UNDER FIRE SALE EXTERNALITIES 2 (2016) (recognizing that “the guidance from theoretical literature on the regulation of liquidity and the interaction between liquidity and capital regulations is quite limited”).

¹⁹⁸ See MARC SAIDENBERG & TIL SCHUERMANN, THE NEW BASEL CAPITAL ACCORD AND QUESTIONS FOR RESEARCH 2 (2003).

¹⁹⁹ Indeed, most of the financial institutions this Article discusses are not even deposit-taking banks. Cf. U.S. Dept. of Treasury, Designation: Financial Stability Oversight

Regulation requiring central clearing addresses a different market failure that causes externalities. Systemically important firms, by virtue of their systemic importance, may be motivated to engage in excessive risk-taking. They would profit by, and therefore internalize the benefits of, successful risk-taking; whereas if their risk-taking fails, they either would be bailed out by the government (thereby externalizing losses onto the government and taxpayers)²⁰⁰ or would externalize much of the systemic harm of their failure onto other market participants and the public.²⁰¹

The primary goal of requiring central clearing should be to correct this market failure.²⁰² This Article thus limits its analysis to central clearing of non-derivative financial contracts that have at least one systemically important counterparty.²⁰³ Regulation requiring central clearing helps to correct this market failure by reducing the likelihood of a systemically important counterparty's default.²⁰⁴ This explains why central clearing regulation is seen as a “notable exception” to the law's reluctance to mandate specific risk-mitigation measures.²⁰⁵

Council, <https://www.treasury.gov/initiatives/fsoc/designations/Pages/default.aspx> (stating that nonbank financial companies and financial market utilities can also be designated as SIFIs). Also, most SIFIs are bank holding companies that do not themselves take deposits. *Id.*

²⁰⁰ See *supra* note 143 and accompanying text.

²⁰¹ *Too Big to Fool*, *supra* note 143, at 770-71; *Systemic Risk*, *supra* note 11, at 206 (explaining this externalization of systemic harm as a type of “tragedy of the commons”). It is a tragedy of the commons insofar as market participants suffer from the actions of other market participants; it is a more standard externality insofar as non-market participants suffer from the actions of market participants.

²⁰² That is a goal of macroprudential regulation, which (as discussed) refers to financial regulation that is concerned with the fundamental stability of the financial system, in contrast to microprudential regulation which is concerned primarily with the safety and soundness of individual financial institutions. See *supra* note 12.

²⁰³ See text accompanying notes 93-94, *supra*.

²⁰⁴ See *supra* notes 11-13 and accompanying text.

²⁰⁵ Cf. Muelbert, *supra* note 191 (observing that central clearing regulation is a “notable exception” to that reluctance under EU law).

The foregoing analysis explains why central clearing can control systemic risk. Next consider mandating central clearing as a means of mutualizing, and thereby limiting, risk.

B. Should Regulators Require Financial Institutions to Mutualize Risk?

This question is effectively a subset of the prior question: If regulators should mandate how financial institutions control risk, should they require those institutions to mutualize risk? Although fully answering this question is beyond this Article's scope, consider possible observations for beginning to answer it.

Requiring central clearing through CCPs helps to mutualize default losses.²⁰⁶ Federal Reserve economists indeed observe that “[m]utualization of risk is . . . a key distinguishing feature of CCP risk management as compared to bank risk management.”²⁰⁷ Mutualization of risk is a form of private insurance; it generally refers to dividing a risk among multiple parties to reduce the chance that its occurrence will cause significant financial loss to any one party.²⁰⁸ Central clearing mutualizes clearing-and-settlement risk among a CCP's clearing members, many of whom are systemically important firms,²⁰⁹ by making each responsible for paying specified amounts for the

²⁰⁶ See *supra* note 17 and accompanying text.

²⁰⁷ Cox & Steigerwald, *supra* note 17, at 7.

²⁰⁸ Roe, *supra* note 145, at 1660 (“This risk-spreading, it’s thought, would stop the first domino from falling. Or, if it falls anyway, the costs of its failure could be dissipated by multiple financial institutions taking a piece of the risk and small part of the loss.”).

²⁰⁹ For example, the Options Clearing Corporation’s clearing members include Deutsche Bank Securities, Inc., Goldman Sachs & Co. LLC, Wells Fargo Securities, LLC, and Citigroup Global Markets Inc. OPTIONS CLEARING CORPORATION, 2016 ANNUAL REPORT 49 (2017), <https://www.theocc.com/components/docs/about/annual-reports/occ-2016-annual-report.pdf>. Even if a clearing member is merely an affiliate of a systemically important firm, that firm is likely to support it. Cf. Arthur E. Wilmarth Jr., *How Should We Respond to the Growing Risks of Financial Conglomerates?*, in FINANCIAL MODERNIZATION AFTER GRAMM-LEACH-BLILEY 22–24, 36–39 (Patricia C. McCoy, Ed. 2002) (observing that “banks and other financial institutions have a powerful reputational interest in supporting their troubled nonbank subsidiaries, regardless of the formalities of corporate separation”).

benefit of the CCP and its clearing members.²¹⁰ That, in turn, corrects the market failure discussed in subpart A by reducing the likelihood of any clearing member's default.

But correcting a market failure does not itself justify regulation. As discussed, proposed regulation additionally must satisfy a cost-benefit analysis.²¹¹ Part III has argued that central clearing may well satisfy that analysis, at least when applied to clearing standardized non-derivative financial contracts with one or more systemically important counterparties.

Viewing central clearing as a way to mutualize risk raises a broader issue: Would regulators be justified in going beyond clearing risk and requiring, for example, the mutualization of investment risk of systemically important firms? This issue has become important to the regulatory debate over whether to require a general privatized systemic risk fund—such as the Systemic Emergency Insurance Fund proposed by Professors Gordon and Muller²¹² or, by analogy to FDIC deposit insurance, the systemic risk fund subsidized by market-participant premiums proposed by Professor Anabtawi and the author.²¹³

²¹⁰ See *supra* notes 161-164 and accompanying text.

²¹¹ The above claim reflects existing law, which at most requires a traditional cost-benefit analysis.

²¹² Jeffrey N. Gordon & Christopher Muller, *Confronting Financial Crisis: Dodd-Frank's Dangers and the Case for A Systemic Emergency Insurance Fund*, 28 YALE J. REG. 151 (2011).

²¹³ Anabtawi & Schwarcz, *supra* note 145, at 1402 (arguing that systemic risk regulation is justified on externalities, and a privatized systemic risk fund can “correct for risk-spillovers in financial markets by requiring firms to take into account the impact of their behavior on systemic stability”). Cf. Arthur E. Wilmarth, Jr., *The Dodd-Frank Act: A Flawed and Inadequate Response to the Too-Big-To-Fail Problem*, 89 OR. L. REV. 951, 1015–22 (2011) (arguing that systemically important firms should be required to pay risk-based insurance premiums which would be used to fund liquidation of failed firms and thus reduce potential bailout costs); Saguato, *supra* note 17 (observing that the “mutualisation and privatization of the guarantee fund might push down the line the necessity of a public bailout”). Such a fund would represent a type of private ordering. Steven L. Schwarcz, *Private Ordering*, 97 NW. U. L. REV. 319, 324–29 (2002).

From the standpoint of systemically harmful externalities, investment risk appears to be at least as critical as clearing risk. Recall that the counterparty risk that caused Lehman Brothers' failure, which contributed to the financial crisis, arose because of its investments in MBS.²¹⁴ Similarly, the counterparty risk that caused AIG's near failure arose under derivatives contracts only because of the collapse of the MBS market.²¹⁵ Even the so-called Volcker Rule,²¹⁶ originally advocated as a panacea for systemic financial instability,²¹⁷ focuses exclusively on investment risk.²¹⁸ The benefits of mutualizing investment risk of systemically important firms should therefore equal or exceed those of mutualizing those firms' clearing risk. If the costs of mutualizing that investment risk are no greater than the costs of mutualizing that clearing risk, regulation requiring that mutualization of investment risk may well be justified.²¹⁹

Normatively, however, one might question whether proposed financial regulation should be justified merely because it would correct a market failure and satisfy a traditional cost-benefit analysis.²²⁰ Scholars should consider whether regulators should go beyond that traditional analysis and also compare the costs and benefits of alternative reasonable regulatory proposals.²²¹ For example, even assuming that the anticipated benefits of mutualizing risk through central clearing, or through a systemic risk fund,

²¹⁴ See *supra* notes 65-66 and accompanying text.

²¹⁵ See *id.*

²¹⁶ Dodd-Frank Act, Pub. L. No. 111-203 sec. 619, § 13 (2010).

²¹⁷ See, e.g., Senator Jeff Merkley & Senator Carl Levin, *The Dodd-Frank Act Restrictions on Proprietary Trading and Conflicts of Interest: New Tools To Address Evolving Threats*, 48 HARV. J. LEGIS. 515, 531-32 (2011).

²¹⁸ The Volcker Rule imposes limitations on proprietary trading in order to prevent banks and other systemically important firms from investing in risky assets. Steven L. Schwarcz, *Regulating Financial Change: A Functional Approach*, 100 MINN. L. REV. 1441, 1486 (2016)

²¹⁹ Cf. *supra* note 211 and accompanying text (discussing cost-benefit analysis).

²²⁰ See *supra* notes 97-100 and accompanying text (observing that such an analysis is satisfied by showing that the anticipated benefits of specific proposed regulation should exceed the regulation's anticipated costs).

²²¹ The author has separately argued for such a consequence-based inquiry to assess proposed regulation from alternative perspectives. See *Changing Law to Address Changing Markets*, *supra* note 97, at 169 (showing that in traditional cost-benefit analysis, "regulators only superficially consider alternatives").

exceed its anticipated costs, regulators may want to—and perhaps should also be required to—compare the anticipated costs and benefits of reasonable alternatives, such as requiring private hedging against counterparty risk.

CONCLUSION

The United States and many other countries are requiring most derivatives contracts to be cleared through central counterparties (CCPs). Regulators believe this central clearing requirement reduces counterparty risk, in turn reducing the risk that counterparty failure could trigger a systemic economic collapse. This Article examines whether the law should also require central clearing for non-derivative financial contracts, whose aggregate counterparty exposure greatly exceeds that on derivatives contracts.

The Article shows that, contrary to media portrayal, the systemic riskiness of derivatives contracts turns on the nature of their counterparties, not on their inherent nature. This insight indicates that non-derivative financial contracts with systemically important counterparties could also be systemically risky. In theory, requiring those financial contracts to be centrally cleared could therefore help to reduce systemic costs arising from that counterparty risk.

Regulation imposing that requirement would be justified only if its overall reduction of systemic costs outweighs the requirement's transaction costs. To reduce transaction costs, the Article proposes that any such regulation be further limited to material non-derivative financial contracts that are standardized. Because non-derivative financial contracts are increasingly being documented in standardized format, this proposal should not unduly limit the benefits of extending central clearing.

In principle, the regulation should also achieve an overall reduction of systemic costs. Central clearing reduces systemic costs arising from the counterparty risk of individual systemically important firms. Although central clearing can also increase

systemic costs by concentrating counterparty risk in CCPs, CCPs used to clear derivatives contracts are significantly protected from that risk concentration. The Article examines how those protections could be adapted to, and possibly also enhanced for, CCPs used to clear non-derivative financial contracts.

Because its cost-benefit balancing is based on rough approximations, an untested premise, and possible differences in the benefits of multilateral netting,²²² the Article does not conclude that regulation should necessarily require central clearing of non-derivative financial contracts. Instead, it argues that if the benefits of centrally clearing derivatives contracts exceed its costs, then the benefits of centrally clearing non-derivative financial contracts might also exceed its costs. The Article's analysis nonetheless should help regulators think about expanding the central clearing requirement to non-derivative financial contracts. It also helps answer important legal questions about why, and the extent to which, regulators should mandate how financial institutions should control risk, and whether they should require financial institutions to mutualize risk.²²³

²²² See *supra* notes 108-121 and accompanying text.

²²³ The author is separately examining how the insight that non-derivative financial contracts with systemically important counterparties could also be systemically risky informs derivatives regulation as well as financial regulation more generally.

APPENDIX 1—CENTRALLY CLEARING NON-DERIVATIVE FINANCIAL CONTRACTS

This Appendix 1 illustrates how non-derivative financial contracts could be centrally cleared and compares that to the central clearing of derivatives contracts. The comparison shows that, in principle, central clearing would work identically for clearing both types of contracts. In practice, however, there would be one difference in clearing: because relatively more counterparties on derivatives contracts are likely to be CCP clearing members, CCPs clearing derivatives contracts could employ more multilateral netting than CCPs clearing non-derivative financial contracts.

Central clearing of derivatives contracts:

Assume that Parties A and B—both clearing members of a CCP—enter into a derivatives contract and that, on the settlement date a year hence, Party B is obligated to pay \$1,000,000 to Party A. If this derivatives contract is centrally cleared, the CCP would be obligated to pay that \$1,000,000 to Party A. Party A thus is subject to the CCP’s credit risk, not Party B’s credit risk.

Once the CCP pays the \$1,000,000 to Party A, the CCP has a reimbursement claim for that amount against Party B.²²⁴ Assuming Party B pays that amount to the CCP, the CCP is made whole. If Party B defaults on paying that amount to the CCP, the CCP might become financially distressed.

To reduce that likelihood of financial distress, the CCP’s clearing members set credit criteria with which the CCP must comply when clearing a contract. To mitigate concentrating systemic risk in the CCP, regulators set the capitalization and other requirements by which clearing members support the CCP. Part IV of the Article discusses these criteria and requirements.

Central clearing of non-derivative financial contracts:

²²⁴ See *supra* 162 and accompanying text.

Using the Article's example of a loan agreement as a typical non-derivative financial contract, assume Party A makes a \$1,000,000 loan to Party B, repayable in a year with 5% interest. At the loan's maturity (i.e., settlement) date, Party B is obligated to repay Party A \$1,000,000 principal and \$50,000 interest. If this loan agreement is centrally cleared and Party A and Party B are clearing members, the CCP would be obligated to pay \$1,050,000 to Party A on the settlement date. Party A thus is subject to the CCP's credit risk, not Party B's credit risk.

Once the CCP pays the \$1,050,000 to Party A, the CCP has a reimbursement claim for that amount against Party B. Assuming Party B pays that amount to the CCP, the CCP is made whole. If Party B defaults on paying that amount to the CCP, the CCP might become financially distressed.

To reduce that likelihood of financial distress, the CCP's clearing members set credit criteria with which the CCP must comply when clearing a contract; and to mitigate concentrating systemic risk in the CCP, regulators set the capitalization and other requirements by which clearing members support the CCP. Again, Part IV of the Article discusses these criteria and requirements.

The foregoing comparison shows that central clearing would work identically, in principle, for clearing both derivatives contracts and non-derivative financial contracts. Next consider the difference, in practice, of clearing these different types of financial contracts.

Central clearing's difference in practice:

This difference would turn on the CCP's ability to engage in multilateral netting. Recall that multilateral netting refers to a CCP's ability to net offsetting payment obligations among its clearing members.²²⁵ Because relatively more counterparties on

²²⁵ See *supra* notes 108-116 and accompanying text.

derivatives contracts are likely to be CCP clearing members,²²⁶ CCPs clearing derivatives contracts could employ more multilateral netting than CCPs clearing non-derivative financial contracts. Here's why.

A CCP clearing a derivatives contract between clearing members Party A and Party B may also be clearing other derivatives contracts involving one or more of these parties and other CCP clearing members, such as Party C. If Party A owes Party B \$1,000,000 and Party B owes Party C \$1,000,000, Party B's offsetting obligations will be set off (i.e., netted) and Party A will simply owe Party C the \$1,000,000.²²⁷ In contrast, a CCP clearing a non-derivative financial contract between clearing members Party A and Party B is less likely to be clearing other non-derivative financial contracts involving one or more of these parties and other CCP clearing members.

The significance of this difference is unclear, however. Although multilateral netting can increase CCP operational efficiencies,²²⁸ it is less certain that it can reduce systemic risk. Going beyond the sources cited,²²⁹ the author is personally skeptical that multilateral netting reduces systemic. The primary argument that it does reduce systemic risk is that it reduces the CCP's aggregate counterparty risk exposure.²³⁰ Thus, in the previous paragraph's example,²³¹ the CCP's aggregate exposure to \$2,000,000 of counterparty risk (owing \$1,000,000 to Party B and \$1,000,000 to Party C) is reduced to \$1,000,000 (i.e., after multilateral netting, only owing \$1,000,000 to Party C).

The possible fallacy of that argument is that it ignores the credit correlations and setoff rights that are inherent in the CCP's chain of making payments. To understand why, compare multilateral netting and bilateral (i.e., the absence of multilateral) netting,

²²⁶ See *supra* notes 172-173 and accompanying text.

²²⁷ See *supra* note 113 and accompanying text.

²²⁸ See *supra* note 121.

²²⁹ See *supra* notes 117-121 and accompanying text.

²³⁰ See *supra* note 117 and accompanying text. *Cf.* text accompanying note 110, *supra* (discussing that multilateral netting allows for the aggregate offset of positions).

²³¹ See text accompanying note 227, *supra*.

in each case based on the prior example. With multilateral netting, after the CCP pays \$1,000,000 to Party C, the CCP will seek reimbursement of that amount from Party A. If Party A reimburses the CCP, the CCP would be fine; but in the unlikely event Party A fails to reimburse the CCP, the CCP's financial integrity would be threatened and it would have to seek the backup protections discussed in Part IV of the Article.

With bilateral netting, the CCP would pay \$1,000,000 to Party B and \$1,000,000 to Party C. After the CCP pays \$1,000,000 to Party C, the CCP will seek reimbursement of that amount from Party B. Because the CCP just paid that amount to Party B, Party B would almost certainly be able to pay the reimbursement. Furthermore, as a matter of law, the CCP should have the right to set off the \$1,000,000 it is obligated to pay to, and to receive as reimbursement from, Party B.²³² Party B therefore should not present a credit risk to the CCP. Party A, however, presents the same credit risk for bilateral as for multilateral netting. After the CCP pays \$1,000,000 to Party B, the CCP will seek reimbursement of that amount from Party A. If Party A reimburses the CCP, the CCP would be fine; but in the unlikely event Party A fails to reimburse the CCP, the CCP's financial integrity would be threatened and it would have to seek the backup protections discussed in Part IV of the Article.

²³² See *supra* note 11 and accompanying text (explaining that parties generally have the right to set off mutually offsetting matured obligations).

APPENDIX 2—STANDARDIZING NON-DERIVATIVE FINANCIAL CONTRACTS

This Appendix 2 explains how to standardize non-derivative financial contracts. The explanation should start with trying to understand the standardization of derivatives contracts. The meaning of standardizing a derivatives contract is somewhat ambiguous, however. The most common interpretation is functional: If a CCP agrees to clear a derivatives contract, that contract is presumed to be standardized.²³³ Using this functional definition, a non-derivative financial contract would be presumed to be standardized if a CCP agrees to clear it.

The Committee of European Securities Regulators has subdivided the concept of standardization into three components: legal uniformity, process uniformity, and product uniformity.²³⁴ Legal uniformity refers to “standard transaction documentation and definitions.”²³⁵ Contracts that are documented on ISDA forms are deemed to have legal uniformity.²³⁶ Because many non-derivative financial contracts are now documented on ISDA forms,²³⁷ such contracts would likewise be deemed to have legal uniformity. Efforts are also underway to further standardize loan agreements to help streamline the trading of participation interests in loans.²³⁸

²³³ *See, e.g.*, Testimony of Timothy Geithner, Secretary of the Treasury, before a joint meeting of the House Financial Services Committee and the House Agriculture Committee (July 10, 2009) (“We will employ a presumption that a derivative contract that is accepted for clearing by any central counterparty is standardized.”); INTERNATIONAL SWAPS AND DERIVATIVES ASSOCIATION, WHITE PAPER: PRODUCT REPRESENTATION FOR STANDARDIZED DERIVATIVES 4 (April 14, 2011) (defining standardized OTC derivatives as “broadly speaking those derivatives that will be centrally cleared or electronically executed”).

²³⁴ Committee of European Securities Regulators, Consultation Paper, Standardisation and Exchange Trading of OTC Derivatives 6 (July 19, 2010).

²³⁵ *Id.* at 6-7.

²³⁶ *Id.*

²³⁷ *See supra* notes 129-130 and accompanying text (observing this is being done to gain the advantage of bankruptcy law’s safe harbor exemptions).

²³⁸ Bridget Marsh & Ted Basta, “Loan Syndications and Trading: An Overview of the Loan Syndications & Trading Association and the Leveraged Loan Market” 1, 7 (discussing the efforts of the Loan Syndications & Trading Association, or LSTA, to create new standard documents to help streamline the trading of loan participations),

Process uniformity refers to the use of automated electronic systems to ensure that details of trades, such as transfers of securities and payments therefor, are accurately recorded.²³⁹ In the author’s experience, payments on material financial contracts involving sophisticated parties—the subset of contracts the Article discusses—are always recorded through automated electronic systems. All of the non-derivative financial contracts discussed in the Article should therefore have process uniformity.

Product uniformity refers to financial products that have similar features.²⁴⁰ The Article uses loan agreements to exemplify non-derivative financial contracts.²⁴¹ Because loan agreements have straightforward repayment schedules for principal and interest, they clearly should represent a uniform product class. Indeed, at least one reviewer of the Article informed the author that loan agreements, as products, tend to be much more uniform than derivatives.²⁴²

The standardization of non-derivative financial contracts for CCP clearing thus appears to have a very low bar, encompassing at least all such contracts that (as is common) are documented on ISDA forms as well as all such contracts that a CCP in fact agrees to clear. This concept of standardization is very different, for example, from the custom and practice for standardizing letters of credit, which is necessary to enable low-

available at
<http://apps.americanbar.org/buslaw/committees/CL190000pub/newsletter/200803/marsh.pdf>. The LSTA’s own website provides further background on that effort. *See* <https://www.lsta.org/>.

²³⁹ Committee of European Securities Regulators, *supra* note 234, at 7-8.

²⁴⁰ *Id.* at 9.

²⁴¹ *See, e.g., supra* note 24 and accompanying text.

²⁴² [After receiving permission, cite to e-mail from reviewer explaining this] (explaining that many derivatives products remain “exotic,” in part because sellers want to retain control of the derivatives product market through customization). *Cf.* Rutter Associates LLC, “Demystifying Exotic Derivatives: What You Need to Know,” (June 2, 2016) (explaining this category of derivatives), available at <http://www.rutterassociates.com/wp-content/uploads/2016/06/Demystifying-Exotic-Derivatives-What-You-Need-to-Know.pdf>.

level bank officers to determine, on a real-time basis and without the exercise of judgment, whether documents presented by the letter-of-credit beneficiary satisfy the payment conditions.²⁴³

²⁴³ *See, e.g.*, Prefatory Note to Uniform Commercial Code Article 5 (Letters of Credit) (discussing the need for uniformity); Official Comments 1, 8, & 9 to UCC § 5-108 (explaining that UCC Article 5 changed its documentary review standard from “substantial compliance” to “strict compliance” to eliminate the need for bank officers to exercise judgment).