

Beyond Bankruptcy: Resolution as a Macroprudential Regulatory Tool¹

Steven L. Schwarcz²

Abstract: To try to protect the stability of the financial system, regulators have been extending bankruptcy-resolution techniques beyond their normal boundaries. The resulting regulation, which focuses on reorganizing or liquidating troubled systemically important firms, is insufficient because it builds without insight into bankruptcy law, which seeks to protect individual firms rather than to protect financial stability. This Article explains those insufficiencies and analyzes how, and why, “macroprudential” resolution-based regulation should be used to help stabilize the financial system. That analysis reveals how such regulation should be designed not only to resolve troubled systemically important firms but also to protect against the failure of markets and other critical elements of the financial system.

¹ Copyright ©2017 by Steven L. Schwarcz.

² Stanley A. Star Professor of Law & Business, Duke University School of Law; Founding Director, Duke Global Financial Markets Center; Senior Fellow, the Centre for International Governance Innovation. E-mail: schwarcz@law.duke.edu. The author thanks Donald S. Bernstein, Stephen J. Lubben, Irit Ronen-Mevorach, . . . and participants in a Duke Law School faculty workshop for valuable comments and Kris S. Liu, Nicholas Strzeletz, and Michael P. Sweeney for invaluable research assistance.

INTRODUCTION.....	2
I. TYPOLOGY OF RESOLUTION-BASED REGULATION	9
A. Reactive Resolution	9
B. Proactive Resolution	15
C. Counteractive Resolution	22
II. IDENTIFYING RESOLUTION’S MACROPRUDENTIAL GOALS	23
A. Resolution Should Protect Systemically Important Firms both Individually and in the Aggregate	23
B. Resolution Should Also Protect Systemically Important Markets and Infrastructure.....	26
III. DESIGNING RESOLUTION-BASED REGULATION TO ACHIEVE THOSE GOALS	30
A. Resolution-based Regulation of Systemically Important Firms	31
B. Resolution-based Regulation of Systemically Important Markets	36
C. Resolution-based Regulation of Systemically Important Infrastructure	39
CONCLUSION.....	45
APPENDIX—Regulatory Design Recommendations	48

INTRODUCTION

Since the global financial crisis of 2008-09 (the “financial crisis”), regulators and policymakers have been shifting their focus from traditional microprudential regulation, which protects individual banks and other financial firms,³ to “macroprudential” regulation that protects the stability of the financial system itself.⁴ Because macroprudential regulation is still very much

³ See, e.g., Behzad Gohari & Karen E. Woody, *The New Global Financial Regulatory Order: Can Macroprudential Regulation Prevent Another Global Financial Disaster?*, 40 J. CORP. L. 403, 406–07 (2015). Microprudential regulation is often simply called prudential regulation. See, e.g., Speech of President Dennis Lockhart, *Thoughts on Prudential Regulation of Financial Firms*, FEDERAL RESERVE BANK OF ATLANTA (Mar. 20, 2015), available at <https://www.frbatlanta.org/news/speeches/2015/150320-lockhart.aspx> (defining prudential regulation as “regulation focused on the safety and soundness of individual institutions”).

⁴ See, e.g., Luis E. Jácome & Erlend W. Nier, *Macroprudential Policy: Protecting the Whole*, INTERNATIONAL MONETARY FUND, <http://www.imf.org/external/pubs/ft/fandd/basics/macropriu.htm>; Speech of Governor Daniel K. Tarullo, *Macroprudential Regulation*, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM (Sep. 20, 2013), <https://www.federalreserve.gov/newsevents/speech/tarullo20130920a.htm>; Gohari & Woody, *supra* note 3, at 403–06.

in the process of developing,⁵ its specific measures are viewed as “tools” in a regulatory “toolkit.”⁶

In designing macroprudential regulation, regulators originally focused on trying to deter events that might trigger financial destabilization.⁷ It is not always clear, however, what those events are or how they could be deterred.⁸ For example, the Dodd-Frank Act seeks to dampen overheated mortgage lending, one of the events that triggered the financial crisis.⁹ But mortgage lending is unlikely to be a trigger of the next crisis; each financial crisis is different from the last and raises new issues.¹⁰

⁵ Cf. *infra* note 18 and accompanying text (observing that regulators themselves admit that current macroprudential regulation may be inadequate).

⁶ See, e.g., International Monetary Fund, *Implementing Macroprudential Policy: Selected Legal Issues* 11 (June 17, 2013) (available at <https://www.imf.org/external/np/pp/eng/2013/061713.pdf>) (discussing macroprudential “tools” and “toolkit”). Even financial law scholars refer to the macroprudential regulatory “tool kit.” See, e.g., Daniel Awrey, et al., *An Overview of the Legal Theory of Finance 2* (2014), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2178066## (unpublished manuscript); Christopher S. Dwight, *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, 614 (2014); Gohari & Woody, *supra* note 3, at 404–05. Cf. 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) (arguing that the tool-kit analogy reflects an ad hoc approach that does not yet fully protect financial stability).

⁷ Iman Anabtawi & Steven L. Schwarcz, *Regulating Ex Post: How Law Can Address the Inevitability of Financial Failure*, 92 TEX. L. REV. 75, 77 (2013) (“Dodd-Frank’s underpinnings reflect a strong *ex ante* financial regulatory bias”). Systemic risk is the risk that a financial system failure will have a significant adverse impact on the real economy.

⁸ Anabtawi & Schwarcz, *supra* note 7, at 93 (observing that we do not yet know all the triggers of systemic risk, nor can we prevent the known triggers, such as panics, from occurring).

⁹ See, e.g., Bradley K. Sabel, *Mortgage Lending Practice after the Dodd-Frank Act*, Harvard Law School Forum on Corporate Governance and Financial Regulation (Nov. 16, 2010), <https://corpgov.law.harvard.edu/2010/11/16/mortgage-lending-practice-after-the-dodd-frank-act/> (discussing Title XIV of the Dodd-Frank Act, implementing the Mortgage Reform and Anti-Predatory Lending Act).

¹⁰ See, e.g., *Why the Next Financial Crisis Will Be Different*, KNOWLEDGE@WHARTON (Oct. 28, 2014), <http://knowledge.wharton.upenn.edu/article/why-the-next-financial-crisis-will-be-different/>.

Likewise, current regulatory efforts to deter excessive risk-taking by systemically important financial firms (“systemically important firms”¹¹) are questionable. Although that risk-taking was a trigger of the financial crisis¹² and appears to be a continuing threat to financial stability,¹³ regulators remain uncertain how to control it.¹⁴ Their deterrent efforts focus on politically appealing factors such as reducing moral hazard and aligning managerial and investor interests.¹⁵ But attributing excessive risk-taking to moral hazard is unsupported by hard evidence and inconsistent with management incentives¹⁶; and aligning managerial and investor interests

¹¹ This Article uses the term “systemically important firm” to reference those firms that have been designated as systemically important by governments. In the United States, for example, the Dodd-Frank Act allows the Financial Stability Oversight Council to designate any firm that “could pose a threat to the financial stability of the United States” as a systemically important financial institution (“SIFI”). Ryan Tracy, *What you need to know about SIFIs*, THE WALL STREET JOURNAL SHORT ANSWER BLOG (Mar. 30, 2016, 1:33 PM), <http://blogs.wsj.com/briefly/2016/03/30/what-you-need-to-know-about-sifis-the-short-answer/>. SIFIs are subject to enhanced supervision by regulators. *Id.*

¹² See, e.g., FIN. CRISIS INQUIRY COMM’N, THE FINANCIAL CRISIS INQUIRY REPORT: FINAL REPORT OF THE NATIONAL COMMISSION ON THE CAUSES OF THE FINANCIAL AND ECONOMIC CRISIS IN THE UNITED STATES xviii–xix (2011) (identifying excessive risk-taking by systemically important firms as a primary cause of the financial crisis); Jacob J. Lew, Opinion, *Let’s Leave Wall Street’s Risky Practices in the Past*, WASH. POST (Jan. 9, 2015) (repeatedly attributing the financial crisis to “excessive risks taken by financial” firms); *The Origins of the Financial Crisis: Crash Course*, ECONOMIST (Sept. 7, 2013), <http://www.economist.com/news/schoolsbrief/21584534-effects-financial-crisis-are-still-being-felt-five-years-article> (identifying excessive risk-taking as one of three causes of the financial crisis, the other causes being irresponsible lending and regulators being “asleep at the wheel”).

¹³ GARY H. STERN & RON J. FELDMAN, TOO BIG TO FAIL: THE HAZARDS OF BANK BAILOUTS 23–28 (2004).

¹⁴ Cf. Timothy F. Geithner, *Are We Safe Yet?: How to Manage Financial Crisis*, FOREIGN AFFAIRS (Dec. 12, 2016) (observing that “[a]lthough regulations [imposing specific requirements] have reined in banks’ risk-taking behavior, they can go only so far”); Hester Peirce, *Clearing, Recovering, and Resolving*, Brookings Center on Regulation and Markets (Feb. 27, 2017), <https://www.brookings.edu/research/clearing-recovering-and-resolving/> (discussing the uncertainty over how law should protect critical elements of the financial system).

¹⁵ Steven L. Schwarcz, *Too Big to Fool: Moral Hazard, Bailouts, and Corporate Responsibility*, 102 MINN. L. REV. (forthcoming issue no. 2, Dec. 2017), available at <http://ssrn.com/abstract=2847026>. Moral hazard generally refers to the temptation of persons who are protected from the negative consequences of their risky actions to take more risks. In this Article’s specific context, moral hazard is the idea that a systemically important firm will take risks assuming it will profit from success and, being “too big to fail,” be bailed out to prevent its failure. *Id.* at 15.

¹⁶ *Id.* at 6–11.

ignores that excessive risk-taking is primarily motivated by a different misalignment—between managerial and investor interests, on the one hand, and the interests of the public, on the other.¹⁷

Frustrated that they have made “little progress in figuring out how they might actually” prevent another financial crisis,¹⁸ regulators have been expanding their macroprudential focus to include bankruptcy “resolution” techniques designed to reorganize the capital structure of,¹⁹ or else to liquidate with minimal systemic impact, systemically important firms that become financially troubled.²⁰ To date, however, regulatory efforts to use those techniques to try to protect financial stability have been inadequate,²¹ in part because bankruptcy law²² traditionally

¹⁷ *Id.*

¹⁸ Binyamin Appelbaum, *Policy Makers Skeptical on Preventing Financial Crisis*, N.Y. TIMES, Oct. 5, 2015, at B1 (reporting the consensus view of an international conference of regulators at the Federal Reserve Bank of Boston). Donald Kohn, former Vice Chairman of the Federal Reserve Board, observed at that conference that the Federal Reserve “doesn’t really have the tools” to prevent another crisis. *Id.* at B3.

¹⁹ The capital structure of a firm refers to the “mix of debt and equity by which a corporation finances its operations.” A HANDBOOK OF BUSINESS LAW TERMS 96 (Bryan A. Garner, ed., 1999). One of the principal goals of a reorganization under Chapter 11 of the Bankruptcy Code is determining what the firm’s new capital structure will be. Mark J. Roe, *Bankruptcy and Debt: A New Model for Corporate Reorganization*, 83 COLUM. L. REV. 527, 528 (1983).

²⁰ See, e.g., Peter O. Muelbert, *Managing Risk in the Financial System*, in THE OXFORD HANDBOOK OF FINANCIAL REGULATION 364, 384 (Niamh Moloney, Eilis Ferran, & Jennifer Payne, eds. 2015) (characterizing “improving the resolvability of financial institutions” (or “making them resolvable in the first place”) as a relevant tool “pursuing a macro-prudential objective—even though partly not ‘prudential’ in nature”; and also observing, at that time, that resolution was not a “main” tool identified with macroprudential policy); Speech of Governor Daniel K. Tarullo, *Departing Thoughts*, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM 25 (Apr. 4, 2017) (calling the “the need for credible resolution mechanisms for large banks” an “important topic[]”); E-mail from Paul Tucker, Senior Fellow, Mossovar-Rachmani Center for Business and Government, John F. Kennedy School of Government, Harvard University, to the author (Dec. 2, 2016) (arguing that because “nothing, other than moving to an economy without debt, can crush the probability [of a systemically important firm’s failure] to 0%,” a “robust policy [should] include[] an effective/credible regime for resolution”). Cf. Financial Stability Board, Key Attributes of Effective Resolution Regimes for Financial Institutions ¶ 3.1 (Oct. 15, 2014), available at http://www.fsb.org/wp-content/uploads/r_141015.pdf (stating that resolution “should be initiated when a firm is no longer viable or likely to be no longer viable, and has no reasonable prospect of becoming so”).

²¹ See *infra* notes 25-29 and accompanying text (and sources referenced therein).

²² References in this Article to bankruptcy law, the term used in the United States, include insolvency law, the term often preferred abroad. See, e.g., Vêra Jourová, *Insolvency Law in Europe—Giving people and businesses a second chance*, Apr. 23, 2015,

has microprudential goals—to protect individual firms that are financially troubled but otherwise viable²³—whereas protecting financial stability is a macroprudential goal.²⁴ Much of the current thinking about using bankruptcy-resolution techniques for macroprudential purposes conflates these goals.

For example, it is commonly assumed that applying bankruptcy-resolution techniques to protect individual systemically important firms will protect all systemically important firms and thereby increase financial stability.²⁵ Regulation based on that assumption, however, can overlook correlations among systemically important firms²⁶ and can sometimes even reduce financial stability.²⁷ Many also believe that bankruptcy law itself should be amended to better adapt it to the resolution of systemically important firms, but that would still be microprudential, designed to protect individual firms rather than the financial system.²⁸ Even the Dodd-Frank Act’s Orderly Liquidation Authority, which applies bank receivership to resolving non-bank systemically important firms, is inherently microprudential.²⁹

These flaws illustrate the need to more carefully and critically analyze the macroprudential goals of resolution, in order to differentiate them from microprudential goals and derive a logically consistent theory of how and why macroprudential resolution-based

https://ec.europa.eu/commission/commissioners/2014-2019/jourova/announcements/insolvency-law-europe-giving-people-and-businesses-second-chance_en.

²³ See *supra* notes 19-20 and accompanying text. One reader of this Article asked why resolution is prudential regulation, as opposed to simply “mopping up the mess.” This Article’s claim is that resolution as currently applied to systemically important firms is microprudential, in that it protects individual firms by trying to reorganize those firms that are financially troubled but otherwise viable. So even if resolution “mops up” the mess of failed ex ante (preventative) prudential regulation, it still represents ex post (reparative) prudential regulation. Cf. Anabtawi & Schwarcz, *supra* note 7 (analyzing the difference between ex ante and ex post financial regulation). In any event, this Article’s larger argument focuses on the potential role of resolution in macroprudential regulation.

²⁴ Cf. *supra* notes 3-4 and accompanying text (describing those regulatory goals).

²⁵ See Part I, *infra* (describing how resolution-based regulation commonly relies on that assumption).

²⁶ See *infra* note 147 and accompanying text.

²⁷ See *infra* notes 121-136 and accompanying text.

²⁸ See *infra* notes 47-50 and accompanying text.

²⁹ See *infra* notes 51-60 and accompanying text.

regulation (hereinafter, “resolution-based regulation”³⁰) can help to stabilize the financial system. This Article begins that analysis, laying the groundwork in Part I by examining how resolution-based regulation is being (or contemplated to be) used and explaining why that use may be insufficient.

Part II then identifies the macroprudential goals of resolution-based regulation. It argues that such regulation should be used to protect systemically important firms not merely individually but also in the aggregate. It also observes that the existing resolution-based regulatory focus on troubled systemically important firms obscures the importance of additionally using resolution-based regulation to protect other critical elements of the financial system whose failure could trigger a systemic collapse—the markets in which securities and other financial assets are traded, and the financial infrastructure that serves to clear and settle that trading.³¹

Part III analyzes how to design resolution-based regulation to achieve those goals,³² using insights gleaned from recognizing that the financial system is a “system.” Systems that are both interactively complex and tightly coupled are prone to catastrophic failure, suggesting that resolution-based regulation should be designed to reduce tight coupling and/or interactive complexity. To this end, Part III argues for resolution-based regulation that would reduce interactive complexity by requiring systemically important firms to disclose more detailed information about their securities holdings and contractual obligations. It also explains how resolution-based regulation could reduce tight coupling by empowering central bank last-resort

³⁰ In accordance with customary bankruptcy usage (*see supra* notes 19-20 and accompanying text), references in this Article to “resolution” include reorganizing the capital structure or liquidating firms that become financially troubled. More broadly, however, this Article uses that term to also include any other ways to restructure or otherwise stabilize a financially troubled firm, market, or other entity—and irrespective of whether that occurs through a court-supervised process (like ordinary bankruptcy) or an administrative process (like FDIC-receivership; *see infra* note 54 and accompanying text).

³¹ *See infra* Parts II.B.2 & II.B.3, respectively.

³² The Appendix to this Article summarizes the resulting design recommendations.

lending to illiquid but solvent systemically important firms³³ and also to avoid financial market panics.

Finally, Part III explains how resolution-based regulation could protect the financial infrastructure, which is operated by clearinghouses and central counterparties. Although private organizations and regulators have been considering how the equivalent of resolution-based solutions could protect central counterparties, they have largely neglected the need to protect clearinghouses that are part of a holding company structure that exposes them to financial and operating risks of affiliates. The Article shows how resolution-based regulation could use ring-fencing to protect against those risks, including by making the clearinghouse bankruptcy-remote. It also explains, by analogy to laws ring-fencing public utilities, why clearinghouses should be ring-fenced: both provide essential public services, have few if any substitutes, and are exposed to affiliate risks.

The reader should note that this Article focuses on developing resolution-based regulation as an *additional* macroprudential “tool.”³⁴ Except as specifically discussed,³⁵ the Article does not purport to critique, much less criticize, other forms of macroprudential regulation.³⁶ Furthermore, the Article’s analysis of the inadequacy of using bankruptcy-resolution techniques that have microprudential goals to try to protect financial stability, a macroprudential goal, is not intended to criticize resolution-based microprudential regulation

³³ In the United States, for example, this would require reversal of the Dodd-Frank Act’s misguided limitation of the Federal Reserve’s emergency lending authority. *See infra* note 201 and accompanying text.

³⁴ *See supra* note 6 and accompanying text. Thus, the Article argues for supplementing, not replacing, existing uses of resolution-based regulation, even if some such uses may be currently flawed as a macroprudential tool (*see, e.g., supra* notes 26-29 and accompanying text).

³⁵ *See supra* notes 7-17 and accompanying text.

³⁶ For example, macroprudential regulation subjects systemically important firms to stress tests that may well take into account aggregate interactions among firms, but that does not replace the independent *resolution-based* regulatory goal of protecting systemically important firms in the aggregate.

itself. Such regulation not only has its own merits but also can valuably complement macroprudential regulation.³⁷

I. TYPOLOGY OF RESOLUTION-BASED REGULATION

As a real-world foundation, first consider how resolution-based regulation is currently being used, or is contemplated to be used. This Article identifies three general approaches.³⁸ The first two approaches—“reactive” resolution and “proactive” resolution—represent resolution in the strict sense of reorganizing the capital structure of, or liquidating, a firm.³⁹ The third approach, “counteractive” resolution, represents regulation that is designed to reduce the need for resolution by mitigating the risk of failure. As such, it is not strictly resolution per se. For that reason, the Article focuses primarily on reactive and proactive resolution.

A. Reactive Resolution

Reactive resolution-based regulation (“reactive resolution”) is by far the most common approach in the United States and worldwide. It is “reactive” in the sense that it applies if, and only if, a firm becomes financially troubled. For example, corporate bankruptcy law is designed to reorganize the capital structure of financially troubled firms to make them viable, and to liquidate such firms that cannot be made viable.⁴⁰ As next explained, reactive resolution is currently being applied both directly and indirectly to systemically important firms.

1. *Applying reactive resolution directly to systemically important firms.*

³⁷ For example, resolution-based microprudential regulation that more efficiently transmits losses to creditors of troubled systemically important firms can motivate those creditors more carefully to monitor their firms’ risk-taking. Reducing risk-taking by systemically important firms is a macroprudential goal. *See Misalignment, infra* note 131.

³⁸ These approaches are, of course, generalizations; there is some potential overlap. *Cf. infra* notes 112 & 193 and accompanying text (discussing examples of possible overlap).

³⁹ *See supra* notes 19-20 and accompanying text.

⁴⁰ In the United States, for example, bankruptcy is governed by Title 11 of the United States Code. The two most common forms of corporate bankruptcy are reorganization, covered by Chapter 11 of Title 11, and liquidation, covered by Chapter 7 of Title 11. *See* DAVID G. EPSTEIN, STEVE H. NICKLES & JAMES J. WHITE, *BANKRUPTCY* 3–4 (1993).

In principle, reactive resolution could apply to any troubled firm, even a troubled systemically important firm.⁴¹ Corporate bankruptcy law, for example, could enable such a firm to restructure an unsustainable debt burden, such as by reducing the principal and interest on that debt and extending its maturities.⁴² So long as the firm has an inherently good business model,⁴³ the debt restructuring could give it a “fresh start.”⁴⁴ The bankruptcies of General Motors and Chrysler broadly followed this restructuring approach.⁴⁵

For at least two reasons, though, traditional bankruptcy may be insufficient as a macroprudential tool. First, bankruptcy law focuses on protecting individual firms, as opposed to also protecting the financial system.⁴⁶ That focus is inherently microprudential. Secondly, the controversial bankruptcy of Lehman Brothers has raised concern that existing corporate bankruptcy law may be ill suited to reorganizing the capital structure of large financial firms.⁴⁷ That concern has prompted proposals to amend bankruptcy law to better adapt it to those types of firms. In the United States, for example, the Hoover Institution has proposed adding a new

⁴¹ Cf. 11 U.S.C. § 109 (not limiting debtors under U.S. bankruptcy law to non-systemically important firms).

⁴² Stuart Gilson, *Coming Through in a Crisis: How Chapter 11 and the Debt Restructuring Industry Are Helping to Revive the U.S. Economy*, 24 J. APPLIED CORP. FIN. 23, 29 (2012).

⁴³ Commentators sometimes refer to such a firm as “good company, bad balance sheet.” See Debtor-in-Possession Loan Rating Criteria, Debtor-in-Possession Loans Special Report (Fitch Investors Service Inc., New York, N.Y.), Mar. 25, 1991, at 4 (stating that Fitch favors rating loans to such bankrupt companies). Reorganization cannot make a financially troubled firm viable if it lacks a good business model. See *id.*

⁴⁴ Although the term “fresh start” is more commonly used for individuals rather than corporations, it is helpfully illustrative in this Article’s context.

⁴⁵ Cf. Ralph Brubaker & Charles Jordan Tabb, *Bankruptcy Reorganizations and the Troubling Legacies of Chrysler and GM*, 2010 U. ILL. L. REV. 1375 (although arguing that these bankruptcy reorganizations “illustrate . . . that there actually is no clean, clear distinction between reorganization by ‘plan’ and reorganization by ‘sale’”).

⁴⁶ Cf. Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Reserve Sys., Speech at the Federal Reserve Bank of Boston 54th Economic Conference (Oct. 23, 2009), available at <https://www.federalreserve.gov/newsevents/speech/bernanke20091023a.htm> (observing that “the bankruptcy code does not always protect the public’s strong interest in avoiding the disorderly collapse of a nonbank financial firm that could destabilize the financial system and damage the economy”).

⁴⁷ Cf. *infra* notes 141-143 and accompanying text (discussing the Lehman bankruptcy).

Chapter 14 to the Bankruptcy Code⁴⁸ and Congress has been considering a proposed Financial Institutions Bankruptcy Act,⁴⁹ in each case to try more appropriately to address the reactive resolution of systemically important firms. These proposed changes to bankruptcy law nonetheless remain microprudential, following the traditional approach of negotiating an individual firm’s debt restructuring.⁵⁰

Another approach to reactive resolution is epitomized by the Orderly Liquidation Authority (OLA),⁵¹ which contemplates a regulatory-supervised proceeding.⁵² The OLA empowers the Federal Deposit Insurance Corporation (FDIC) to put certain large, troubled financial institutions into FDIC receivership.⁵³ The articulated justification for the OLA is that

⁴⁸ See, e.g., Thomas H. Jackson & David A. Skeel, Jr., *Dynamic Resolution of Large Financial Institutions*, 2 HARV. BUS. L. REV. 435, 458–59 (2012) (critiquing a proposal made by the Hoover Institution for adding a new Chapter 14 to the Bankruptcy Code); Emily C. Kapur & John B. Taylor, *A New Tool for Avoiding Big-Bank Failures: ‘Chapter 14’*, WALL ST. J. (Mar. 10, 2016, 6:53 P.M. E.T.), <https://www.wsj.com/articles/a-new-tool-for-avoiding-big-bank-failures-chapter-14-1457654027> (“The solution is not to break up the banks or turn them into public utilities. Instead, we should do what Dodd-Frank failed to do: Make big-bank failures feasible without tanking the economy by writing a process to do so into the bankruptcy code.”).

⁴⁹ The Financial Institutions Bankruptcy Act of 2017 (“FIBA”) was proposed in April 2017 under H.R. 1667 to include a new financial-institutions-bankruptcy subchapter V to Chapter 11 of the U.S. Bankruptcy Code.

⁵⁰ That negotiation is primarily undertaken by the debtor, its creditors, and its shareholders in connection with a court-supervised bankruptcy proceeding. See, e.g., Steven L. Schwarcz, *Basics of Business Organization in Bankruptcy*, in BANKRUPTCY: A SPECIAL COLLECTION FROM THE JOURNAL OF COMMERCIAL BANK LENDING (1987), at 79–80.

⁵¹ The OLA was created under title II of the Dodd-Frank Act. See 12 U.S.C. §§5381-5394.

⁵² Although beyond this Article’s scope, some fear that the proposals to amend bankruptcy law discussed supra notes 48-49 and accompanying text could undercut the OLA. For example, the proposed CHOICE Act would repeal the OLA and substitute for it a Financial Institutions Bankruptcy Act. See Jeffrey N. Gordon, Mark J. Roe, et al., “Financial Scholars Oppose Eliminating ‘Orderly Liquidation Authority’ As Crisis-Avoidance Restructuring Backstop” 5 (May 23, 2017 letter to Congress) (hereinafter, “Financial Scholars Letter”), available at https://www.law.columbia.edu/sites/default/files/microsites/law-economics-studies/scholars_letter_on_ola_-_final_for_congress.pdf.

⁵³ Kwon-Yong Jin, *How To Eat an Elephant: Corporate Group Structure of Systemically Important Financial Institutions, Orderly Liquidation Authority, and Single Point of Entry Resolution*, 124 YALE L. J. 1746, 1754 (2014). The OLA gives the FDIC “extensive latitude in managing the company.” For example, it provides the FDIC with “the power to merge [the firm] with another institution, to transfer the institution’s assets (without any consent or approval), to

FDIC receivership has been used successfully for decades as a scheme for resolving insolvent banks⁵⁴ and thus should be extended to troubled non-banks.⁵⁵

The OLA has been criticized, however, as being neither transparent nor predictable, with the potential to increase moral hazard:

[The OLA is an] opaque process [giving] unprecedented discretionary power [to the FDIC to] render critical judgments without explanation or even a record or forum for disputes. [It is unpredictable because the FDIC can] treat similarly situated creditors dissimilarly.⁵⁶

Like the proposed changes to bankruptcy law, the OLA is also inherently microprudential because it focuses on protecting individual firms.⁵⁷ Furthermore, the success of FDIC receivership historically has depended on larger healthy banks acquiring troubled banks.⁵⁸ If a large financial firm becomes troubled, there may not always be a larger healthy financial firm

suspend legal actions pending against the company, to avoid certain transfers, and to disallow claims that are not proven to its satisfaction.” *Id.* at 1754–55.

⁵⁴ Banks are exempted from corporate bankruptcy law. *See* 11 U.S.C. § 109(b)(2).

⁵⁵ [cite] At least part of the impetus for creating the OLA may have been that FDIC officials, who were thus familiar and comfortable with FDIC receivership as a means of resolving insolvent banks, were integrally involved in formulating the federal government’s regulatory response to the financial crisis. [cite]

⁵⁶ Stephen E. Hessler, *A Better Idea for Bankrupt Big Banks*, WALL ST. J., Apr. 25, 2017, at A17 (suggesting the FDIC’s power to treat creditors dissimilarly will cause politically connected creditors to expect higher recoveries, increasing moral hazard by making them less cautious when extending credit).

⁵⁷ The OLA may not be quite as microprudential as traditional bankruptcy, however, because the FDIC, as an administrative agency, has much more discretion and flexibility than individual bankruptcy judges to coordinate the resolution of multiple troubled firms in light of systemic concerns.

⁵⁸ Historically, the FDIC has had three options when dealing with a troubled bank. The strongly preferred option is to find a healthier bank to purchase the troubled bank, through what is called a purchase and assumption (P&A) transaction. FED. DEPOSIT INS. CORP., *MANAGING THE CRISIS: THE FDIC AND RTC EXPERIENCE 1980-1984*, at 55–56 (1998), also available at <https://www.fdic.gov/bank/historical/managing/history1-02.pdf>. In the second option, called open bank assistance (OBA), the FDIC lends money to the troubled bank. OBA has rarely been used, the last time being in 1992. *Id.* Its disfavor might be due to the uncertainty of whether an insolvent bank will be able to repay the FDIC loan. The FDIC’s third option is simply to liquidate the troubled bank. *Id.*

willing, much less available and able, to acquire the troubled firm.⁵⁹ As a result, the FDIC may have to “heavily subsidize the [troubled firm’s acquisition under the OLA], a point in some tension with the notion that Dodd-Frank has ended bailouts.”⁶⁰ This scarcity of eligible acquiring firms would become especially critical if multiple financial firms become troubled around the same time.

For these reasons, reactive resolution-based regulation that currently adapts, or has been proposed to adapt, bankruptcy and its variants to systemically important firms may be insufficient as a macroprudential tool.

2. Applying reactive resolution indirectly to systemically important firms.

Reactive resolution-based regulation that currently applies indirectly to systemically important firms is even more problematic. This is exemplified by the so-called “derivatives safe harbor” of the U.S. Bankruptcy Code, which is also widely followed outside the United States.⁶¹ This safe harbor epitomizes how regulatory confusion over cause and effect, in this case influenced by a powerful industry trade group,⁶² can actually increase systemic risk.⁶³

In contrast to rights of other creditors, the safe harbor allows derivatives counterparties “virtually unlimited enforcement rights against the debtor”⁶⁴ on the supposition that such rights

⁵⁹ Cf. Stephen J. Lubben, *Resolution, Orderly and Otherwise: B of A in OLA*, 81 U. CIN. L. REV. 485, 509 (2013) (questioning whether the analogy the Dodd-Frank Act makes between bank receivership and financial institution failure holds up to careful scrutiny). Professor Lubben notes, for example, that “in times of systemic crisis there might well be no buyers large enough or confident enough to perform a similar function [i.e., to engage in a P&A transaction as discussed in note 58, *supra*] with regard to a large financial institution.”

⁶⁰ *Id.*

⁶¹ See Steven L. Schwarcz & Ori Sharon, *The Bankruptcy-Law Safe Harbor for Derivatives: A Path-Dependence Analysis*, 71 WASH. & LEE L. REV. 1715 (2014).

⁶² See *id.* at 1741–42 (discussing the powerful lobbying influence of the International Swaps and Derivatives Association, or “ISDA”).

⁶³ See *supra* notes 26-27 and accompanying text.

⁶⁴ Steven L. Schwarcz, *Derivatives and Collateral: Balancing Remedies and Systemic Risk*, 2015 U. ILL. L. REV. 699, 700 (hereinafter, “*Derivatives and Collateral*”). For example, derivatives counterparties “can immediately collect on their debts at the beginning of a bankruptcy while other creditors cannot,” and “they need neither return eve-of-bankruptcy preferential payments on old debts nor give back preferential collateral calls that other creditors must return.” Mark D.

are “necessary to protect against systemic risk.”⁶⁵ Ironically, as explained below, those rights can amplify systemic risk.⁶⁶

Unlimited enforcement rights permit derivatives counterparties to offset net claims against the debtor, thereby allowing them “to concentrate their positions with relatively few [derivatives] dealers.”⁶⁷ That concentration “can spread a chain of defaults among financial institutions.”⁶⁸ The safe harbor can also amplify systemic risk by undermining market discipline; derivatives counterparties “know that they often will be paid even if their [debtor counterparty] fails.”⁶⁹ Professor Roe believes that such lack of market discipline increased systemic harm from the failures of Bear Stearns and Lehman Brothers during the financial crisis.⁷⁰ Furthermore, the safe harbor applies by its terms to all firms in bankruptcy that are parties to derivatives contracts, not merely to such firms that are systemically important.⁷¹ That can inadvertently force the liquidation of an otherwise viable systemically important firm.⁷²

Roe, *The Derivatives Markets Payment Priorities as Financial Crisis Accelerator*, 63 STAN. L. REV. 539, 547 (2011). In 2014, ISDA issued the Resolution Stay Protocol to eliminate these rights for parties that opt into the Protocol regime. See International Swaps and Derivatives Assoc., *ISDA 2014 Resolution Stay Protocol*, <https://www2.isda.org/functional-areas/protocol-management/faq/20>. Opting in “prevents derivatives counterparties that have adhered to the Protocol from immediately terminating outstanding derivatives contracts, giving regulators time to resolve the troubled institution in an orderly way.” *Id.* “The effect of these stays therefore would be to prevent counterparties to a SIFI in resolution from exercising early termination rights so long as the SIFI continues to pay and perform. Cf. David Geen, et al., *A Step Closer to Ending Too-Big-To-Fail: The ISDA 2014 Resolution Stay Protocol and Contractual Recognition of Cross-Border Resolution*, 35 No. 3 FUTURES & DERIVATIVES L. REP. 1 (Apr. 2015) (arguing that these stays are “a cornerstone of a resolution authority’s ability to preserve a failed SIFI as a going concern”); Irit Ronen-Mevorach, *Beyond the Search for Certainty: Addressing the Cross-Border Resolution Gap*, 10 BROOK. J. CORP. FIN. & COMM. L. 183, 205 (2015) (discussing post-financial-crisis changes to the World Bank Insolvency and Creditor/Debtor Regimes Standard in relation to the treatment of derivatives contracts).

⁶⁵ *Derivatives and Collateral*, *supra* note 64, at 700.

⁶⁶ *Id.* at 708.

⁶⁷ *Id.*

⁶⁸ *Id.* & *id.* at 709.

⁶⁹ Roe, *supra* note 64, at 541–42.

⁷⁰ See *id.* at 550–55.

⁷¹ *Derivatives and Collateral*, *supra* note 64, at 712.

⁷² See *id.*

B. Proactive Resolution

Some resolution-based regulation is “proactive” in the sense that it consists of pre-planned enhancements that are designed, at a time when a systemically important firm’s default is merely a theoretical possibility, to take effect if the firm becomes troubled—by then strengthening the firm’s ability to pay its debt (and thereby avoid default) or facilitating its resolvability. Proactive resolution is implicitly justified by chaos theory, “which recognizes that failures are almost inevitable in complex [engineering] systems.”⁷³ Given the inevitability of failure, the most successful (complex) systems are those in which the consequences of failures are limited.⁷⁴

Engineering design often limits those consequences through “modularity,” which involves “partially closing off some parts of the system . . . enabl[ing] repairs to be made before the entire system shuts down.”⁷⁵ This helps to reduce the chance that a failure in one part of the system will systemically trigger a failure in another part. I have separately argued that chaos theory should apply equally to the problem of inevitable systemic shocks in the complex financial system.⁷⁶ Similar to “modularity,” proactive resolution involves reparative measures intended to prevent, and therefore to limit the consequences of, a system failure.

Proactive resolution-based regulation is currently being applied to systemically important firms in at least four ways.

1. *Converting debt to equity.*

This type of approach seeks to pre-engineer a change to a systemically important firm’s capital structure that becomes effective if the firm experiences financial problems. Regulators have been discussing this approach, but they do not always acknowledge that it is effectively resolution-based.

⁷³ Steven L. Schwarcz, *Regulating Complexity in Financial Markets*, 87 WASH. U. L. REV. 211, 248 (2009) (hereinafter, “*Regulating Complexity*”).

⁷⁴ *Id.*

⁷⁵ *Id.* at 248–49.

⁷⁶ *Id.* (focusing on the aspect of chaos theory regarding deterministic chaos in dynamic systems, which recognizes that the more complex the system, the more likely it is that failures will occur).

Different iterations of this approach have been referred to as total loss-absorbing capacity (“TLAC”) and contingent convertible securities (“CoCos”).⁷⁷ In each case, a systemically important firm would be required to have a requisite portion of its debt in the form of securities that convert to equity upon pre-set conditions.⁷⁸ Such conversion would reduce the firm’s indebtedness, thereby (hopefully) making the firm financially viable again.⁷⁹ The possibility that their debt claims could be converted into equity should also motivate creditors to take on more of a “monitoring” role by imposing stricter covenants,⁸⁰ which could reduce the firm’s risk-taking.⁸¹

CoCos have been issued in Europe,⁸² where the initial tests of their conversion have had mixed success. In early June 2017, the junior-bond CoCos of Spain’s Banco Popular converted

⁷⁷ Cf. Single Resolution Board, *MREL: Approach Taken in 2016 and Next Steps* (2016), available at https://srb.europa.eu/sites/srbsite/files/srb_mrel_approach_2016_post_final.pdf (discussing “the TLAC standard developed under the aegis of the FSB for Global Systemically Important Banks”).

⁷⁸ See, e.g., Erica Jeffrey, *TLAC: What You Should Know*, EUROMONEY (Aug. 10, 2016) (reporting that TLAC contemplates that systemically important firms issue minimum levels of debt and similar securities “that can be written down or converted into equity in case of resolution”); Edward Simpson Prescott, *Contingent Capital: The Trigger Problem* 98 ECON. Q. 33 (2012). See also Federal Reserve Board, Press Release on Total Loss Absorbing Capacity Requirement (Oct. 30, 2015); Board of Governors of Federal Reserve System, Notice of proposed rulemaking: “Total Loss-Absorbing Capacity, Long-Term Debt, and Clean Holding Company Requirements for Systemically Important U.S. Bank Holding Companies and Intermediate Holding Companies of Systemically Important Foreign Banking Organizations,” 80 Federal Register 74,926 (Nov. 30, 2015).

⁷⁹ Jianping Zhu et al., *From Bailout to Bail-in: Mandatory Debt Restructuring of Systemic Financial Institutions* (IMF Staff Discussion Note, SDN/12/03, Apr. 2012), available at <http://www.imf.org/external/pubs/ft/sdn/2012/sdn1203.pdf>

⁸⁰ Emiliios Avgouleas & Charles Goodhart, *Critical Reflections on Bank Bail-ins*, 1 J. FIN. REGULATION 1, 4-5 (2015).

⁸¹ This monitoring aspect is counteractive because it designed to reduce the need for resolution. See *supra* note 39 and accompanying text.

⁸² The Financial Stability Board has made this approach a significant part of its plans to end the perceived too-big-to-fail problem of systemically important firms—the idea that such firms might engage in excessive risk-taking because they would profit by a success and be bailed out by the government to avoid a failure. See Financial Stability Board, *Resilience through Resolvability – Moving from Policy Design to Implementation*, 5th Report to the G20 on Progress in Resolution (Aug. 18, 2016), at 8, available at <http://www.fsb.org/wp->

as planned to prevent the bank’s failure.⁸³ Later that month, in contrast, the senior-bond CoCos of Italy’s Veneto Banca and Banca Popolare di Vicenza were not converted, resulting in a taxpayer bailout of those banks.⁸⁴ Although there are ways to try to distinguish these cases,⁸⁵ some argue they reflect the inevitable failure of CoCos as a viable resolution option.⁸⁶ Additional questions also remain regarding the actual implementation of a CoCo conversion policy, including what should trigger the debt to convert⁸⁷ and how to ensure that creditors holding convertible debt are compensated without making the debt too costly.⁸⁸

CoCos can also raise their own moral hazard concern—that a “bank that issues contingent capital faces a moral hazard incentive to increase its assets’ jump risks”—i.e., the risk

content/uploads/Resilience-through-resolvability-%E2%80%93moving-from-policy-design-to-implementation.pdf.

⁸³ *Senior Moment: Europe’s Framework for Dealing with Troubled Banks is Working, but has One Big Drawback*, ECONOMIST (July 1, 2017), at 12.

⁸⁴ *Id.*

⁸⁵ For example, the new European agency in charge of bank resolution, the Single Resolution Board (SRB), apparently determined that the Italian banks “did not pose a threat to financial stability, and handed them to the Italian authorities to deal with under national insolvency procedures”). *Id.* Although there is no evidence of this, the SRB might also have been more reluctant to convert senior than junior bonds.

⁸⁶ See, e.g., Neel Kashkari, *New Bailouts Prove ‘Too Big to Fail’ Is Alive and Well*, WALL ST. J. (July 10, 2017), at A17 (arguing that the Italian bank bailouts prove that “‘bail-in debt’ doesn’t prevent bailouts”). Kashkari contends that CoCos won’t work because governments “fear financial contagion” if they “force losses on bondholders.” *Id.* Where systemic risk isn’t at issue, he maintains that CoCos won’t work because “governments may worry that bondholders are politically important constituents.” *Id.* Professor Admati likewise argues that it “is unrealistic to expect that regulators will trigger recovery and resolution processes that are complex, costly and untested so that losses can be imposed on debt-like TLAC securities, and that they would be politically able to follow up with imposing losses on creditors of mandatory conversion to equity. This is particularly true if a potential crisis is looming, since pulling triggers and inflicting haircuts might have unpredictable consequences throughout the opaque financial system.” Anat R. Admati, *The Missed Opportunity and Challenge of Capital Regulation*, NAT’L. INST. ECON. REV. No. 235, R4, R10 (Feb. 2016).

⁸⁷ See Emiliios Avgouleas et al., *Living Wills as a Catalyst for Action*, Duisenberg School of Finance Policy Paper No. 4, 4 (2010)

⁸⁸ Paul Melaschenko & Noel Reynolds, *A Template for Recapitalising Too-big-to-fail Banks*, Banks for International Settlement’s Quarterly Review 25, 34 (May 2013); Eric S. Halperin, *Coco Rising: Can the Emergence of Novel Hybrid Securities Protect from Future Liquidity Crises?*, 8 BYU INT’L L. & MGMT. REV. 15, 21–23 (2011) (explaining why issuing CoCos to investors may be more expensive than issuing ordinary debt).

that bank assets can suffer large, sudden losses.⁸⁹ In other words, issuers of CoCos may be motivated to invest in risky assets because such issuers will be protected against a fall in asset value by the CoCos' debt-to-equity conversion. Attempts to reduce this moral hazard, such as by including restrictive contractual covenants, can be overly rigid and "impair[] the managers' ability to pursue value-maximizing projects."⁹⁰ Yet the failure to reduce this moral hazard is likely to further increase the cost of issuing CoCos.⁹¹

Even if CoCos did not raise the concerns discussed above, their use is limited to protecting individual systemically important firms. That limitation alone may make them insufficient as a macroprudential regulatory tool.

2. *Resolving the corporate structure.*

Effectively, this approach pre-plans wiping out the equity owners of a troubled systemically important firm, making either the government or the firm's creditors the new equity owners. This approach is similar to a "bail-in."⁹²

As a macroprudential tool, this approach is increasingly exemplified by the "single point of entry" (SPOE) strategy.⁹³ This strategy is artificially dependent on systemically important

⁸⁹ George Pennacchi, "A Structural Model of Contingent Bank Capital," Federal Reserve Bank of Cleveland, Working Paper No. 10-04 (rev. June 2011), at 30, available at <https://business.illinois.edu/gpennacc/ConCap030211.pdf>.

⁹⁰ Simone M. Sepe, *Corporate Agency Problems and 'Dequity' Contracts*, 36 J. CORP. L. 113, 145 (2010). Another concern over this moral hazard is that it will increase the cost of CoCos.

⁹¹ Cf. Pennacchi, *supra* note 89, at 22 (arguing that investors in CoCos that are subject to "downward jumps in value" will "demand higher new issue yields to compensate for these potential losses").

⁹² Although the terminology is inexact, a "bail-in" usually refers to writing off creditor claims, as opposed to equity interests. See, e.g., <http://www.economist.com/blogs/economist-explains/2013/04/economist-explains-2> & <http://www.wsj.com/articles/a-new-worry-for-bank-investors-bail-in-risk-1455705000>.

⁹³ See, e.g., Daniel K. Tarullo, "Toward Building a More Effective Resolution Regime: Progress and Challenges," Remarks at the Federal Reserve Board and Federal Reserve Bank of Richmond Conference (Oct. 18, 2013) ("Planning for the Orderly Resolution of a Global Systemically Important Bank," Washington, D.C. ("The aim of the single-point-of-entry approach is to stabilize the failed firm quickly, in order to mitigate the negative impact on the U.S. financial

firms having a parent-subsidary organizational structure in which a non-systemically-important parent holds the stock of the systemically important subsidiary.⁹⁴ At the start, therefore, the strategy faces legal challenges for systemically important firms that lack that organizational structure.⁹⁵

Under the SPOE strategy, if the subsidiary begins to fail, a government agency⁹⁶ would become the receiver of the parent,⁹⁷ wiping out the parent-company's shareholders (and potentially writing down some of its debt).⁹⁸ The receiver then may provide temporary liquidity to the parent to keep the subsidiary operating (thereby avoiding the instability that rocked the financial markets after Lehman Brothers collapsed⁹⁹), while it seeks to sell its receivership interest to equity investors to bring in more permanent capital.¹⁰⁰ Proponents of the SPOE strategy are optimistic it can work once implementation challenges are resolved.¹⁰¹ Others, however, believe the strategy is unlikely to be practical. For example, some scholars characterize it as “a resolution tool designed for a very stylized, even hypothetical sort of failure.”¹⁰² The president of the Federal Reserve Bank of Minneapolis observes that there is no way to test the strategy's effectiveness until it is actually in use and doubts it will be useful in a stressed

system, and to do so without supporting the firm's equity holders and other capital liabilities holders or exposing U.S. taxpayers to losses.”).

⁹⁴ 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).

⁹⁵ This challenge might be especially high for cross-border firms whose organizational structure is subject to regulation in multiple jurisdictions.

⁹⁶ In the United States, this agency would be the FDIC pursuant to the OLA. *See supra* notes 51-53 and accompanying text.

⁹⁷ Mechanically, the steps described above might take place through a bridge company. The above simplified description nonetheless would still accurately depict the economics of the SPOE strategy.

⁹⁸ *See, e.g.*, Jerome H. Powell, Ending “Too Big to Fail,” Remarks at the Institute of International Bankers 2013 Washington Conference, Washington, D.C. (March 14, 2013), available at <http://www.federalreserve.gov/newsevents/speech/powell20130304a.htm>.

⁹⁹ Jin, *supra* note 53, at 1764.

¹⁰⁰ Powell, *supra* note 98.

¹⁰¹ Jeremy C. Stein, *Regulating Large Financial Institutions, in* WHAT HAVE WE LEARNED?: MACROECONOMIC POLICY AFTER THE CRISIS 136 (2014).

¹⁰² Stephen J. Lubben & Arthur E. Wilmarth, Jr., *Too Big and Unable to Fail*, FLA. L. REV. 2 (2016).

economic climate.¹⁰³ Others argue that “[r]eputational contagion” may cause investor flight within the United States once the holding company is liquidated, regardless of how many subsidiaries are still operating.¹⁰⁴

Even if the SPOE strategy superseded these legal challenges and were otherwise practical, it operates primarily to protect individual systemically important firms and only secondarily to protect financial stability.¹⁰⁵ That operation might limit its effectiveness as a macroprudential regulatory tool.

3. *Pre-planning liquidation.*

The Dodd-Frank Act also requires certain systemically important firms to file so-called living wills, which are resolution plans setting forth how they could liquidate with minimal systemic impact if they become financially troubled.¹⁰⁶ Although this requirement is intended to protect financial stability without needing a bailout,¹⁰⁷ it might not completely eliminate that

¹⁰³ Neel Kashkari, “Lessons from the Crisis: Ending Too Big to Fail,” Address at the Brookings Institution, Washington, D.C. (Feb. 16, 2016), transcript available at <https://www.minneapolisfed.org/news-and-events/presidents-speeches/lessons-from-the-crisis-ending-too-big-to-fail>.

¹⁰⁴ Charles Goodhart & Emiliios Avgouleas, *A Critical Evaluation of Bail-ins as Bank Recapitalisation Mechanisms*, Centre for Economic Policy Research Discussion Paper 10065 1, 34 (July 2014). Cf. Paul H. Kupiec & Peter J. Wallison, *Can the “Single Point of Entry” Strategy be used to Recapitalize a Failing Bank?*, AEI Economic Working Paper 2014-08 6-7 (Dec. 3, 2014) (discussing the possibility that the FDIC may have to borrow from the U.S. Treasury to recapitalize subsidiaries, and expressing concern that Title II of the Dodd-Frank Act prohibits bank-subsidiary recapitalization using such funds; and also observing that if the use of the funds are challenged, the losses are likely to fall on taxpayers).

¹⁰⁵ Cf. *supra* note 99 and accompanying text (discussing the possible provision of temporary liquidity to help avoid financial instability).

¹⁰⁶ See, e.g., Jennifer Meyerowitz et al., *A Dodd-Frank Living Wills Primer: What you Need to Know Now*, 31 AM. BANKR. INST. J. 34, 34 (Aug. 2012) (“As part of the goal to remove the risks to the financial system posed by ‘too big to fail’ institutions, § 165(d) of the Dodd-Frank Act requires systemically important financial institutions to create living wills to facilitate rapid and orderly resolution, in the event of material financial distress or failure”) (internal quotations omitted).

¹⁰⁷ Cf. Clay R. Costner, *Living Wills: Can a Flexible Approach to Rulemaking Address Key Concerns Surrounding Dodd-Frank’s Resolution Plans?*, 16 N.C. BANKING INST. 133, 138–40 (2012) (summarizing arguments for how living wills might help address the too-big-to-fail problem).

need. In my many years as a workout and bankruptcy lawyer, I rarely saw a firm’s failure that accurately reflected, much less closely resembled, expectations about the firm when it was profitable. Furthermore, living wills do not prevent the concurrent failure of multiple otherwise-systemically important firms from collectively having a systemic impact.¹⁰⁸ The financial crisis demonstrated that a concurrence of failures is likely when the causes of the failures are interconnected, such as widespread investor overreliance on subprime mortgage loans as a source of payment and on the reliability of credit ratings.¹⁰⁹

4. *Last-resort lending.*

Illiquidity is the primary factor that can cause firms to fail.¹¹⁰ Most countries authorize their governmental central bank to act as a lender of last resort, with power to advance funds to solvent systemically important firms that are, nonetheless, unable to pay their debts as they come due (i.e., illiquid).¹¹¹ Such lending is proactive because it is pre-planned to strengthen the firm’s ability to pay its debts if it becomes troubled.¹¹² In the United States, however, the Dodd-Frank Act has sharply limited the Federal Reserve’s authority to make emergency loans to individual financial firms.¹¹³ This limitation appears somewhat excessive, if not dangerous.¹¹⁴

¹⁰⁸ Cf. Victoria McGrane, *FDIC Chief Martin Gruenberg: Big Bank Failure Won’t Imperil System*, WALL ST. J., May 12, 2015, at C1 (observing that some in Congress “doubt regulators could handle the failure of multiple major firms at the same time”).

¹⁰⁹ Steven L. Schwarcz, *Protecting Financial Markets: Lessons from the Subprime Mortgage Meltdown*, 93 MINN. L. REV. 373, 379-83 & 404-05 (2008). Cf. Janet L. Yellen, Vice-Chair of Board of Governors of the Federal Reserve System, Speech at the Annual Meeting of the National Association for Business Economics, Denver, Col., Oct. 11, 2010, *available at* 2010 WL 3952044 (F.R.B.) (attributing the financial crisis to concurrences of interrelated failures).

¹¹⁰ See, e.g., SCOTT BESLEY & EUGENE F. BRIGHAM, *PRINCIPLES OF FINANCE 600* (6th ed. 2015) (observing that “the primary reason that firms fail is because they are unable to meet their working capital needs”).

¹¹¹ [cite] The U.S. Federal Reserve Bank, for example, has had this role of lender of last resort to banks. Federal Reserve Act of 1913 § 13(3), 12 U.S.C. § 343 (2010).

¹¹² Cf. *supra* note 73 and accompanying text (defining proactive resolution). Because of the borrowing firm’s solvency, last-resort lending might also arguably be categorized as counteractive.

¹¹³ Dodd-Frank Act § 1101 (limiting the Federal Reserve Bank’s power under § 13(3) of the Federal Reserve Act).

¹¹⁴ See, e.g., Jeffrey N. Gordon & Christopher Muller, *Confronting Financial Crisis: Dodd-Frank’s Dangers and the Case for a Systemic Emergency Insurance Fund*, 28 YALE J. ON REG. 151, 156 (2011).

In sum, existing and contemplated proactive resolution-based regulation may also (like reactive resolution-based regulation) be insufficient as a macroprudential tool.

C. Counteractive Resolution

This regulatory approach is “counteractive” in the sense that it is designed to reduce the need for resolution by preventing firms from becoming financially troubled. As such, it does not strictly represent resolution *per se*.¹¹⁵ For example, regulation imposing capital and liquidity-coverage requirements is designed to keep systemically important firms solvent and able to pay their debts, thereby reducing the need for resolution.¹¹⁶ Capital and liquidity-coverage requirements, however, are typical forms of ordinary microprudential regulation.

Nonetheless, counteractive regulation is sometimes discussed as part of the topic of resolving systemically important firms.¹¹⁷ That broader focus goes beyond this Article’s focus on regulation that is truly resolution-based and would unnecessarily expand the Article’s scope.¹¹⁸ This Article therefore limits its analysis below to reactive and proactive resolution.¹¹⁹

¹¹⁵ *See supra* note 39 and accompanying text.

¹¹⁶ *Cf.* International Insolvency Institute annual meeting, London, June 19, 2017 panel discussion of SIFI resolution (discussing capital and liquidity-coverage requirements as a form of “counteractive” resolution-based regulation).

¹¹⁷ *See id.* (discussing not only regulation imposing capital and liquidity-coverage requirements but also regulating SIFI governance as a way to reduce excessive SIFI risk-taking).

¹¹⁸ Including counteractive regulation would expand the Article’s scope to include all forms of regulation that mitigate the risk of failure.

¹¹⁹ For an intuitive way to distinguish this Article’s categories of reactive, proactive, and counteractive regulation, consider the colloquial reference to a firm going into bankruptcy as the “sh-t” hitting the fan. *Cf.*

<http://www.urbandictionary.com/define.php?term=shit%20hits%20the%20fan> (defining that as “the point at which an already unstable situation devolves into utter chaos”). Reactive resolution-based regulation would try to clean up the mess once the sh-t hits the fan (analogous to reorganization) or, if the fan is irreparably damaged, to throw it out (analogous to liquidation). Proactive resolution-based regulation would try to prevent the sh-t, once thrown, from actually hitting the fan. Counteractive regulation would try to prevent the sh-t from ever being thrown at the fan. The analogy is even more robust: if the sh-t hits the fan and splatters all over, that would cause externalities that are analogous to this Article’s systemic harm.

This Part I has shown that the current and contemplated uses of reactive and proactive resolution may be insufficient as a macroprudential regulatory tool. The Article next analyzes, more normatively, how and why resolution-based regulation should be used as a macroprudential tool. To this end, Part II identifies what the macroprudential regulatory goals of resolution should be. Thereafter, Part III examines how resolution-based regulation should be designed to better achieve those goals.

II. IDENTIFYING RESOLUTION’S MACROPRUDENTIAL GOALS

The goal of macroprudential regulation generally is to protect the stability of the financial system.¹²⁰ The macroprudential regulatory goals of resolution should therefore be to help achieve financial stability. To that end, resolution should certainly be used to protect systemically important firms. The analysis below first demonstrates, however, that using resolution to protect each such firm individually is insufficient to protect all such firms. Resolution should also be adapted, if feasible, to protect systemically important firms in the aggregate. Thereafter, the analysis shows why resolution should additionally be used, to the extent feasible, to protect the systemically important markets and infrastructure that, together with firms, comprise the financial system.

A. Resolution Should Protect Systemically Important Firms both Individually and in the Aggregate

Intuitively, regulation that protects individual systemically important firms might appear to protect all systemically important firms. That expectation extrapolates the logic of the distributive law of mathematics, that “the result of first adding several numbers and then multiplying the sum by some number is the same as first multiplying each separately by the number and then adding the products.”¹²¹ Thus, if no systemically important firm fails, no such firm’s failure would trigger a systemic collapse. As next explained, however, the distributive-law

¹²⁰ See *supra* note 4 and accompanying text.

¹²¹ *Distributive law*, ENCYCLOPAEDIA BRITANNICA (June 1, 2006), <https://www.britannica.com/topic/distributive-law>. The distributive law is stated symbolically as $a \times (b + c) = a \times b + a \times c$. *Id.*

analogy between mathematics and systemic risk is misleading.¹²² Furthermore, other failures can trigger a systemic collapse.¹²³

The distributive-law analogy is misleading for several reasons.¹²⁴ Professor Mokal observes, for example, that regulatory theory views “[s]ystemic risk . . . in a bottom-up manner as a simple aggregation of the risk of individual institutions, with the implication that ‘the whole financial system is sound if and only if each institution is sound.’”¹²⁵ He argues, however, that protecting individual firms can sometimes aggravate financial instability, using the example of “netting” inter-firm liabilities to reduce a firm’s exposure¹²⁶:

[Netting] is based on the simplistic view that systemic risk is pro tanto reduced to the same extent as the reduction in risk to each individual financial institution in the system. [But] netting encourages greater leverage and inter-party concentrations, weakens lending standards by exacerbating financial agency and adverse selection costs, redistributes counterparty risk rather than reducing it, exacerbates market volatility in times of stress, and thus creates an additional channel for risk transmission, propagating the effects of shock through the financial system.¹²⁷

The distributive-law analogy is also misleading because individual systemically important firms are not always resolved in a way that reduces systemic risk. Corporate

¹²² See *infra* notes 123-131 and accompanying text.

¹²³ See *infra* notes 136-143 and accompanying text.

¹²⁴ Cf. Douglas J. Elliott, et al., *The History of Cyclical Macroprudential Policy in the United States* 6 (Fed. Reserve Bd., Finance and Economics Discussion Series No. 2013-29, 2013), <http://www.federalreserve.gov/pubs/feds/2013/201329/201329pap.pdf> (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”).

¹²⁵ Rizwaan Jameel Mokal, *Liquidity, Systemic Risk, and the Bankruptcy Treatment of Financial Contracts*, 10 BROOK. J. CORP. FIN. & COM. L. 15, 21–22 (2015).

¹²⁶ Professor Mokal further argues that regulatory theory focuses too heavily on “procyclical measures of risk” that are inappropriate for systemic stability. *Id.* at 21. For example, “[c]redit ratings . . . have long been recognized as failing timeously to predict crises, and bank capital and loan loss provisioning regulations premised on [a procyclical focus] have proven potent amplifiers that exacerbate financial sector stress.” *Id.* at 21–22.

¹²⁷ *Id.* at 19. In the derivatives context, I have made similar arguments about the potential for netting to increase inter-party concentrations, weaken credit standards, and otherwise increase systemic risk. See *supra* notes 67-70 and accompanying text.

reorganization law, for example, normally looks to the parties in interest to reach a consensual debt restructuring plan,¹²⁸ absent which the firm could attempt to cram down a plan over those parties' objections or, in a worst case, be liquidated.¹²⁹ The parties in interest are limited primarily, however, to the firm and its investors (i.e., its creditors and shareholders).¹³⁰ As shown in a separate context, the interests of those parties are fundamentally misaligned with the public's interest to reduce systemic risk.¹³¹

Finally, the distributive-law analogy does not address correlated triggers that cause the concurrent failure of multiple systemically important firms. Regulation intended to protect individual systemically important firms may then be overwhelmed. Ironically, regulation designed to protect individual firms can even create correlated triggers. For example, regulators generally require insurance companies to divest corporate bonds that are downgraded below an investment-grade rating, in order to protect individual insurers against a loss in the value of assets available to pay claims.¹³² That requirement, however, has the potential to correlate an industry-wide dumping of bonds that lose that rating, in turn causing a systemically risky bond-market collapse.¹³³

To overcome these limitations, resolution-based regulation should be designed to try to protect systemically important firms not merely individually but also in the aggregate.

¹²⁸ See 11 U.S.C. § 1109(b) (listing the parties in interest).

¹²⁹ Compare 11 U.S.C. § 1129(b) (discussing the cram-down requirements that a plan be fair and equitable and not discriminate unfairly) with 11 U.S.C. § 1112 (discussing the ability of bankruptcy courts to convert a reorganization case to a liquidation for cause, including inability to confirm a plan of reorganization).

¹³⁰ See *supra* note 128.

¹³¹ Steven L. Schwarcz, *Misalignment: Corporate Risk-Taking and Public Duty*, 92 NOTRE DAME L. REV. 1 (2016). Cf. *supra* note 17 and accompanying text (referencing that misalignment).

¹³² Daniel Schwarcz & Steven L. Schwarcz, *Regulating Systemic Risk in Insurance*, 81 U. CHICAGO L. REV. 1569, 1596, 1602 (2014).

¹³³ *Id.* Cf. Muelbert, *supra* note 21, at 395 (observing that financial regulation that “causes banks to act in a (more) uniform way . . . will increase systemic risk”); ERIK F. GERDING, LAW, BUBBLES, AND FINANCIAL REGULATION 13 (2014) (arguing that regulations can create investment preferences for certain asset classes, setting the stage for asset bubbles and disastrous bank runs).

B. Resolution Should Also Protect Systemically Important Markets and Infrastructure

Even if systemically important firms could be protected both individually and in the aggregate, the failure of other critical elements of the financial system could trigger a systemic collapse.¹³⁴ Resolution-based regulation should also have the goal of protecting those other elements against failure.

One such critical element is the financial markets that facilitate the transfer (i.e., the issuance and trading) of securities.¹³⁵ For example, the financial crisis was more fundamentally caused by a collapse in the market for mortgage-backed securities than by the failure of systemically important firms such as Lehman Brothers.¹³⁶ In 2007, when home prices began declining, subprime borrowers could not refinance and, in many cases, defaulted. Even borrowers who could afford to pay their mortgage loans were tempted to walk away as mortgage loans exceeded home values. These mortgage defaults in turn caused substantial amounts of low investment-grade mortgage-backed securities to default and some AAA-rated securities to be downgraded. The defaults were especially large for certain highly leveraged securities,¹³⁷ which were indirectly backed by subprime mortgages; full payment of even the senior classes of these securities was extremely sensitive to cash-flow variations and dependent on the (failed) assumption that housing prices would continue to appreciate.¹³⁸ These defaults and downgradings of rated securities, in turn, unnerved investors who believed that AAA meant ironclad safety and that investment grade meant relative freedom from default.¹³⁹

¹³⁴ Cf. Anabtawi & Schwarcz, *supra* note 7, at 102 (discussing the “elements and interconnections” of the financial system that permit it to function as a “system”). For something to qualify as a system, (1) it must be composed of elements, (2) its elements must be interconnected, and (3) it must have a function that is distinct from its elements. DONELLA H. MEADOWS, *THINKING IN SYSTEMS: A PRIMER* 11 (Diana Wright ed., 2008). The financial system therefore clearly qualifies as a “system.”

¹³⁵ Cf. Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L.J. 193, 202 (2008) (discussing the systemic importance of financial markets and observing that the extraordinary growth of disintermediation is making markets increasingly important to the financial system).

¹³⁶ This financial crisis discussion is adapted from the author’s *Keynote Address: Understanding the Subprime Financial Crisis*, 60 S. C. L. REV. 549 (2009).

¹³⁷ These were called “ABS CDO” securities.

¹³⁸ *Understanding the Subprime Financial Crisis*, *supra* note 136, at 550.

¹³⁹ *Id.* at 552.

Investors started losing confidence in ratings and avoiding debt securities. Reduced demand caused the price of debt securities to fall, requiring firms using those securities as collateral to mark them to market and put up cash; and generating cash required the sale of more securities, causing market prices to plummet further downward in a death spiral.¹⁴⁰ The market prices of mortgage-backed securities, for example, collapsed substantially below the intrinsic value of the mortgage-loan assets underlying those securities. This collapse in market prices required banks and other financial institutions holding mortgage-backed (and other asset-backed) securities to write down the securities' value. That in turn made institutions with significant holdings of these securities, such as Lehman Brothers, appear (if not be) more financially risky, raising concern over counterparty risk.¹⁴¹ Afraid these institutions might default on their contractual obligations, many parties stopped dealing with them. The refusal of the U.S. government to save Lehman Brothers in mid-September 2008, and its resulting bankruptcy, added to the panic. Debt markets became so spooked that even the short-term commercial paper markets virtually shut down. Without debt-market financing, which constitutes approximately 58% of all corporate credit availability,¹⁴² companies lacked money to expand and sometimes even to pay current expenses.¹⁴³ The economy collapsed.

¹⁴⁰ The high leverage of many firms appears to have made this death spiral worse. Encouraged by the earlier liquidity glut, many firms had borrowed excessively because the cost of funds was so cheap.

¹⁴¹ Counterparty risk refers to the risk that a party may default on its contractual obligation to another party. Colleen Baker, *The Federal Reserve as Last Resort*, U. MICH. J.L. REF. 69, 74 (2012).

¹⁴² Silvio Contessi, Li Li, & Katheryn Russ, *Bank vs. Bond Financing Over the Business Cycle*, 31 ECONOMIC SYNOPSIS 1, 1 (2013), available at https://research.stlouisfed.org/publications/es/13/ES_31_2013-11-15.pdf. By comparison, bank loans make up only about 10% of corporate credit availability. *Id.* These estimates are based on 2003-2013 data. *Id.*

¹⁴³ See, e.g., Fiorella De Fiore & Harald Uhlig, *Corporate Debt Structure and the Financial Crisis*, at 2, https://economicdynamics.org/meetpapers/2012/paper_429.pdf (“the implication of the turmoil for economic activity [during the financial crisis] was a drop in investment and output that was unprecedented”).

Another critical element of the financial system whose failure could trigger a systemic collapse is its infrastructure,¹⁴⁴ which (among other functions) provides the clearing¹⁴⁵ and settlement¹⁴⁶ services needed to consummate the transfer of securities and other financial assets and the payment therefor.¹⁴⁷ The clearinghouses and other firms currently providing the bulk of these services are sometimes called financial market utilities (FMUs).¹⁴⁸ For example, The Depository Trust Company (DTC) is an FMU that clears and settles the transfer of securities¹⁴⁹ and the Chicago Mercantile Exchange is an FMU that clears and settles transactions involving “exchange-traded contracts” and over-the-counter (OTC) derivatives.¹⁵⁰ Some FMUs, known as

¹⁴⁴ Cf. 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> (discussing the consequences of “loss of continuity of critical clearing services on which the financial system has come to depend”).

¹⁴⁵ 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.en.pdf>.

¹⁴⁶ 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.*

¹⁴⁷ For a broader discussion of the financial infrastructure, see https://www.federalreserve.gov/paymentsystems/designated_fmu_about.htm.

¹⁴⁸ Cf. Dodd-Frank Act Article VIII (referring to FMUs as “multilateral systems that provide the infrastructure for transferring, clearing, and settling payments, securities, and other financial transactions among financial institutions or between financial institutions and the system”). A simple example of an FMU’s function is to provide the basic mechanism by which financial assets are conveyed from seller to buyer and reciprocal compensation is conveyed from buyer to seller. Richard Heckinger et al., The Federal Reserve Bank of Chicago, *Financial market utilities and the challenge of just-in-time liquidity*, Chicago Fed Letter No. 268a, Nov. 2009, at 1, available at <https://www.chicagofed.org/publications/chicago-fed-letter/2009/november-268a>. The FSOC has the power to designate an FMU as systemically important “if the failure of or a disruption to the functioning of the FMU could create or increase the risk of significant liquidity or credit problems spreading among financial institutions or markets and thereby threaten the stability of the U.S. financial system.” FIN. STABILITY OVERSIGHT COUNCIL, 2012 ANNUAL REPORT 110 (2012). At least eight of the largest FMUs, known as SIFMUs (for Systemically Important FMUs), have been so designated. Dan Ryan, *Financial Market Utilities: Is the System Safer?*, HARV. L. SCHOOL FORUM ON CORP. GOV. & FIN. REG. (Feb. 21, 2015), available at <https://corpgov.law.harvard.edu/2015/02/21/financial-market-utilities-is-the-system-safer/>.

¹⁴⁹ Steven L. Schwarcz, *Intermediary Risk in a Global Economy*, 50 DUKE L. J. 1541, 1549–50 (2001).

¹⁵⁰ See Chicago Mercantile Exchange Group, *CME Group Overview*, available at <http://www.cmegroup.com/company/files/cme-group-overview.pdf> (describing the Exchange’s

central counterparties (CCPs),¹⁵¹ also help to reduce counterparty risk that can result from those procedural steps.¹⁵²

To understand how an FMU's failure could trigger a systemic collapse, consider the failures, first, of an FMU that clears and settles securities transactions and, thereafter, of an FMU acting as a CCP to help reduce counterparty risk that can result from the settlement of derivatives transactions.¹⁵³ Although the clearing and settlement services performed by the first FMU are unlikely to cause it to fail,¹⁵⁴ some FMUs are part of a holding company structure that exposes them to other risks.¹⁵⁵ If, say, an FMU's corporate parent files for bankruptcy, the FMU could easily become part of the bankruptcy estate.¹⁵⁶ Any resulting suspension of clearing and settlement, even if temporary, could disrupt the transfer of securities and cause a financial panic.¹⁵⁷

The systemic risks are even greater for an FMU acting as a CCP to help reduce counterparty risk. Such a CCP reduces counterparty risk by assuming the potential obligation of each counterparty to pay the other counterparty on the settlement date.¹⁵⁸ Thus, if the settlement

activities) & Federal Reserve, *Designated Financial Market Utilities*, available at https://www.federalreserve.gov/paymentsystems/designated_fm_u_about.htm (confirming that the Exchange is an FMU).

¹⁵¹ Baker, *supra* note 141, at 74.

¹⁵² This counterparty risk being the risk that a party involved in the transfer, clearance, or settlement defaults on its contractual obligation to another such party. *See id.*

¹⁵³ In the United States, all standardized derivatives transactions must be settled through such a CCP. Dodd-Frank Act, tit. VII.

¹⁵⁴ This assumes the FMU provides those services without negligence.

¹⁵⁵ *See infra* notes 250-260 and accompanying text.

¹⁵⁶ This could occur in various ways in the United States, including the parent causing its FMU subsidiary to file for bankruptcy under 11 U.S.C. § 301 or the FMU being substantively consolidated with the parent under 11 U.S.C. § 105.

¹⁵⁷ The question of whether the FMU's bankruptcy would suspend clearing or settlement would be an issue of first impression under 11 U.S.C. § 362(a) (imposing a stay automatically suspending various interactions between a debtor and third parties).

¹⁵⁸ Heckinger et al., *supra* note 148, at [cite] (observing that CCPs legally interpose themselves between counterparties, becoming “the legal buyer to every seller and the legal seller to every buyer”). *See, e.g.*, FIN. STABILITY OVERSIGHT COUNCIL, *supra* note 148, at 172 (discussing ICE Clear Credit, a CCP that clears credit-default swap (CDS) derivatives, thereby “lower[ing] the

requires counterparty A to pay counterparty B, the CCP will make that payment to counterparty B and then seek reimbursement from counterparty A.¹⁵⁹ Although this reduces individual counterparty risk, it concentrates aggregate counterparty risk in the CCP.¹⁶⁰ If the CCP is unable to obtain sufficient aggregate reimbursement, it may itself default.¹⁶¹ That in turn 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.”¹⁶²

For these reasons, the macroprudential goals of resolution-based regulation should include protecting not only systemically important firms (both individually and in the aggregate) but also the systemically important markets and infrastructure that, together with such firms, comprise the financial system. Next consider how resolution-based regulation could be designed to achieve those goals.

III. DESIGNING RESOLUTION-BASED REGULATION TO ACHIEVE THOSE GOALS

This Part begins by examining how resolution-based regulation could protect systemically important firms in the aggregate,¹⁶³ considering both reactive and proactive resolution.¹⁶⁴ Thereafter, it examines how resolution-based regulation could protect systemically

likelihood of default leading to a financial contagion of defaults across major CDS counterparties”).

¹⁵⁹ [cite]

¹⁶⁰ Iman Anabtawi & Steven L. Schwarcz, *Regulating Systemic Risk: Towards an Analytical Framework*, 86 NOTRE DAME L. REV. 1349, 1394–95 (2011).

¹⁶¹ *Id.* I am not claiming that default is inevitable. CCPs typically rely on a variety of risk-management strategies, including margin requirements and the maintenance of a loss-sharing pool funded by members to cover losses arising from any clearing member defaults. *See supra* note 160, at 1394–95. *Cf. See also* Ryan, *supra* note 148 (observing that some of these risk-management strategies are required by law).

¹⁶² Duffie, *supra* note 144 (arguing that a CCP’s “fail[ure] to meet its obligations to other systemically [important] clearing members” could cause that contagion).

¹⁶³ *See* Part III.A, *infra*.

¹⁶⁴ This Part III does not focus on counteractive regulation because, as discussed, that broader focus would be conceptually inconsistent with resolution-based regulation and also would unnecessarily expand the Article’s scope. *See supra* note 117 and accompanying text.

important markets and infrastructure,¹⁶⁵ again considering both reactive and proactive resolution. The Appendix to this Article summarizes the resulting design recommendations.

A. Resolution-based Regulation of Systemically Important Firms

As discussed, resolution-based regulation of systemically important firms should have the macroprudential goal of protecting such firms not only individually but also in the aggregate. Consider how that could be done.

1. *Reactive resolution.*

Reactive resolution-based regulation is inherently limited in its ability to protect systemically important firms in the aggregate; by the time multiple firms become troubled, it may be too late to effectively reorganize their capital structure to make them viable. Even the recent proposals to amend bankruptcy law to better adapt it to systemically important firms are limited in this way.¹⁶⁶ The author is part of a group of bankruptcy and financial regulation scholars that has been considering this problem, among others.¹⁶⁷

There are at least two limiting constraints. First, even if some of these systemically important firms could be reorganized, the “economy will need a coordinated response, particularly if the entire financial system suffers a panic or lack of liquidity.”¹⁶⁸ In the United States, “[b]ankruptcy judges cannot provide that coordinated response.”¹⁶⁹ Regulatory-

¹⁶⁵ See respectively Parts III.B & III.C, *infra*.

¹⁶⁶ See *supra* note 50 and accompanying text.

¹⁶⁷ Cf. Financial Scholars Letter, *supra* note 52, at 4 (discussing the possibility of “multiple institutions failing or tottering simultaneously”). The main purpose of this letter was to oppose proposed legislation that would replace the FDIC’s Orderly Liquidation Authority with a new bankruptcy procedure for resolving systemically important firms. Financial Scholars Letter, *supra* note 52, at 4. Cf. *supra* note 108 and accompanying text (observing that living wills do not prevent the concurrent failure of multiple firms, and that protection designed for individual firms may be overwhelmed by, and thus inadequate to protect against, the concurrent failure of multiple firms).

¹⁶⁸ Financial Scholars Letter, *supra* note 52, at 4.

¹⁶⁹ *Id.* (arguing that bankruptcy judges “cannot caucus and decide how to handle multiple bankruptcies in a way that best stabilizes the economy” because they “have neither a mandate, nor the proper experience, nor the staff needed to design a plan to protect the financial system as a whole”).

supervised resolution, however, could provide a more coordinated response.¹⁷⁰ Regulatory reassurance might also help to reduce the risk of a financial panic.¹⁷¹

This Article has already discussed regulatory-supervised reactive resolution by the FDIC, pursuant to its receivership powers under the OLA.¹⁷² As an administrative agency, the FDIC certainly has more discretion and flexibility than individual bankruptcy judges to coordinate the resolution of multiple troubled firms.¹⁷³ However, the OLA’s own limitations, such as its overdependence on healthy large firms to acquire troubled firms and its lack of transparency and predictability,¹⁷⁴ may well impair the FDIC’s ability to provide a fully coordinated response or even to provide regulatory reassurance. A regulatory-supervised resolution procedure that more closely parallels judge-supervised bankruptcy might help to supersede those limitations while providing a coordinated response.¹⁷⁵ Although such a procedure might raise its own limitation—that supervising regulatory officials will likely have much less resolution expertise than bankruptcy judges—that limitation could be addressed in various ways, including by assigning bankruptcy judges, as needed, to be supervisors of the regulatory procedures.¹⁷⁶

The other constraint is the difficulty of raising sufficient financing—typically referred to as “debtor in possession” or “DIP” financing—to enable multiple troubled systemically important firms to continue operating for the length of time needed to reorganize their capital structure. Absent DIP financing, a firm may have little choice but to liquidate.¹⁷⁷ The “private sources” that ordinarily provide DIP financing in traditional bankruptcy cases “would be either

¹⁷⁰ *Id.*

¹⁷¹ *Id.* Cf. Financial Crisis Inquiry Commission, THE FINANCIAL CRISIS INQUIRY REPORT: FINAL REPORT OF THE NATIONAL COMMISSION ON THE CAUSES OF THE FINANCIAL AND ECONOMIC CRISIS IN THE UNITED STATES 436-437 (2011) (arguing that investor fear leading to the financial crisis was compounded by the failure of regulatory agencies to quickly address the problem or reassure investors that the problem was isolated).

¹⁷² See *supra* notes 51-59 and accompanying text (discussing those receivership powers).

¹⁷³ Cf. *supra* note 57 (observing that the FDIC, as an administrative agency, has much more discretion and flexibility than individual bankruptcy judges to coordinate the resolution of multiple troubled firms in light of systemic concerns).

¹⁷⁴ See *supra* notes 58-56 and accompanying text.

¹⁷⁵ [Consider expanding this example. cite]

¹⁷⁶ [Might that raise any separation-of-power issue? cite]

¹⁷⁷ [cite]

unavailable or at least inadequate” to resolve large systemically important firms.¹⁷⁸ That lack of private DIP financing would be exacerbated, of course, if a multitude of such firms need financing at the same time.

If private sources are inadequate, the government itself might consider providing—and thus an appropriate government agency should at least be authorized to provide—the DIP financing. The U.S. and Canadian governments provided DIP financing, for example, in the General Motors bankruptcy.¹⁷⁹ As the receiver of troubled deposit-taking banks, the FDIC also has authority to take “action or provide assistance [that] is necessary to avoid or mitigate serious adverse effects on economic conditions or financial stability,” which arguably includes providing DIP financing if sufficient private financing is unavailable.¹⁸⁰ The ability and willingness of governments to extend DIP financing more broadly are beyond this Article’s scope.¹⁸¹

2. Proactive resolution.

This Article has shown that existing and contemplated proactive resolution-based regulation may also be insufficient as a macroprudential tool.¹⁸² To try to design proactive

¹⁷⁸ Howell E. Jackson & Stephanie Massman, *The Resolution of Distressed Financial Conglomerates* 60-61, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2912980.

¹⁷⁹ Christine Caulfield, *GM Gets OK To TAP \$33B In DIP Financing*, LAW 360 (June 25, 2009), available at <https://www.law360.com/articles/108332/gm-gets-ok-to-tap-33-3b-in-dip-financing>.

¹⁸⁰ Jackson & Stephanie Massman, *supra* note 178 (internal quotation marks omitted) (citing 12 U.S.C. §1823(c)(4)(G)).

¹⁸¹ In the United States, the Federal Reserve might also have authority to “engage in lender-of-last resort functions for appropriate collateralized credit under a program or facility with broad-based eligibility.” Jackson & Massman, *supra* note 178, at 67 (referencing § 13(3) of the Federal Reserve Act).

¹⁸² Requiring systemically important firms to have a requisite portion of their debt in the form of securities that convert to equity if the firm experiences financial problems (such as TLAC and CoCos) may be insufficient because the initial tests of such conversion have had mixed success and, more importantly, the use of conversion is limited to protecting individual firms. *See* Part I.B.1, *supra*. Trying to control the failure of systemically important firms by having a government agency become the receiver of the parent, wiping out the parent-company’s shareholders (and potentially writing down some debt) (such as the SPOE strategy), may be insufficient because it is artificially dependent on systemically important firms having a parent-subsidiary organizational structure; even then it may be ineffective in a stressed economic climate; and it operates primarily to protect individual systemically important firms and only

resolution-based regulation as a more effective macroprudential tool, consider insights into protecting financial stability from viewing the financial system as a “system.”¹⁸³

Systems in general—and the financial system in particular—that are both interactively complex¹⁸⁴ and tightly coupled¹⁸⁵ are “prone to catastrophic failures” because that combination “obfuscate[s] risk and present[s] little opportunity for intervention following a local shock.”¹⁸⁶ By contrast, systems that are interactively complex but not tightly coupled, and systems that are tightly coupled but not interactively complex, are less systemically risky.¹⁸⁷ This suggests that proactive resolution-based regulation should be designed to reduce tight coupling and/or interactive complexity among systemically important firms. Such regulation would not only help to prevent individual firms from failing but also would make it less likely that multiple firms fail around the same time.

secondarily to protect financial stability. *See* Part I.B.2, *supra*. Requiring systemically important firms to pre-plan their liquidation with minimal systemic impact if they become troubled (such as living wills) may be insufficient because a firm’s expectations while profitable rarely accurately reflect the reality when the firm becomes troubled and also because liquidation pre-planning will not prevent the concurrent failure of multiple otherwise-systemically important firms from collectively having a systemic impact. *See* Part I.B.3, *supra*. And central bank last-resort lending may be insufficient because, at least in the United States, the Dodd-Frank Act has sharply limited the Federal Reserve’s authority to make these types of loans. *See* Part I.B.4, *supra*.

¹⁸³ *Cf. supra* note 134 (showing that the financial system “clearly qualifies as a ‘system’”).

¹⁸⁴ An “interactively complex system is one whose components can interact in unexpected or varied ways . . .” As a result, a shock to one component can lead to “. . . failures that seem to come out of nowhere or that appear unfathomably improbable.” RICHARD BOOKSTABER, *DEMON OF OUR OWN DESIGN* 154-55 (2007).

¹⁸⁵ A “tightly coupled system is one that is highly interdependent, so that a disturbance to one part of the system can spread almost instantaneously to other parts of the system.” Anabtawi & Schwarcz, *supra* note 7, at 94.

¹⁸⁶ *Id.* at 112.

¹⁸⁷ Anabtawi & Schwarcz, *supra* note 7, at 112. For example, a “system that is interactively complex but only loosely coupled . . . is likely to produce unpredictable interactions among its elements because of the system’s interactive complexity. However, the ultimate damage to such a system from a failure at the level of its elements is likely to be manageable because loose coupling presents opportunities for early intervention.” *Id.*

Consider how proactive resolution-based regulation could be designed to reduce that interactive complexity.¹⁸⁸ Systemically important firms cause at least two sources of interactive complexity in the financial system, both resulting from information failures. The first source of interactive complexity is that market participants do not know what securities other firms hold.¹⁸⁹ As a form of risk aversion, they therefore assume that distressed securities owned by a given firm are also held by similarly situated firms.¹⁹⁰ If any of those firms fails, they may become reluctant to extend credit to similar firms—even those that, in fact, are financially healthy.¹⁹¹ The loss of credit can then trigger unpredictable failures of those healthy firms, hastening a financial crisis.¹⁹² Proactive resolution-based regulation could help to reduce this source of interactive complexity by requiring systemically important firms to disclose—at least periodically, if not also on demand—the amount and identity of their securities holdings.¹⁹³

The other source of interactive complexity is that market participants do not know the contractual obligations of other firms.¹⁹⁴ Yet if a firm defaults on its obligations, its counterparties may be forced to default on their own obligations.¹⁹⁵ Again, therefore, risk-averse market participants may refuse to extend credit to firms that appear similar to a defaulting firm but in fact are financially healthy, thereby triggering unpredictable failures of those healthy firms and hastening a financial crisis.¹⁹⁶ The risk aversion is likely to be especially high if market participants fear a firm is contingently obligated on derivatives contracts that expose it to

¹⁸⁸ Regulation probably cannot eliminate interactive complexity because information failures, which underlie the complexity, are inherent in human arrangements. Complexity itself can also sometimes be beneficial; for example, derivatives can be used to better allocate risk among market participants.

¹⁸⁹ Anabtawi & Schwarcz, *supra* note 7, at 94.

¹⁹⁰ *Id.* at 95.

¹⁹¹ *Id.* at 95–96.

¹⁹² *Id.* at 94 (discussing that interactive complexity causes that unpredictability).

¹⁹³ I categorize this form of resolution-based regulation as proactive because it provides for a pre-planned enhancement (enhanced disclosure) that takes effect if the firm becomes troubled by potentially losing access to credit. That disclosure then strengthens the firm's ability to pay its debt (and thereby avoid default) by providing continued access to credit. *See* text accompanying notes 72–73, *supra* (defining proactive resolution-based regulation). Requiring disclosure might also be seen as counteractive.

¹⁹⁴ Anabtawi & Schwarcz, *supra* note 7, at 114.

¹⁹⁵ *Id.* at 88.

¹⁹⁶ *Id.* at [cite].

indeterminate liability.¹⁹⁷ Proactive resolution-based regulation¹⁹⁸ could help to reduce this source of interactive complexity by requiring systemically important firms, as before,¹⁹⁹ to disclose the precise amount and nature of their contractual obligations.²⁰⁰

Proactive resolution-based regulation could also help to reduce tight coupling. Notably, central bank last-resort lending could help to prevent a disturbance to one part of the financial system—a default by a solvent but illiquid systemically important firm—from spreading rapidly to other parts of the system, including the defaulting firm’s counterparties. Such lending would provide liquidity to the firm to prevent its default; and because the firm is solvent, it should ultimately be able to repay the loan. I have separately argued that the Dodd-Frank Act’s restrictions on the Federal Reserve’s authority to make these types of loans should be reversed.²⁰¹

Next consider how resolution-based regulation could be designed to protect systemically important markets and infrastructure. Relatively little regulation currently protects those critical elements of the financial system.²⁰²

B. Resolution-based Regulation of Systemically Important Markets

1. *Reactive resolution.*

¹⁹⁷ *Regulating Complexity*, *supra* note 73, at 243-45.

¹⁹⁸ This form of resolution-based regulation is proactive for the reasons discussed *supra* note 193.

¹⁹⁹ *See supra* notes 192-194 and accompanying text.

²⁰⁰ *Cf. Regulating Complexity*, *supra* note 73, at 203-207 & 246 (discussing disclosure as an option to help avoid a “crisis of confidence”). Generally accepted accounting principles (GAAP) do not require sufficient disclosure of contractual obligations, especially contingent obligations, to reduce interactive complexity. GAAP requires parties to disclose contingent liabilities only if the contingency is a “reasonable possibility,” which itself is a subjective determination. *Id.* at notes 181-83.

²⁰¹ *See Controlling Financial Chaos, The Power and Limits of Law*, 2012 WIS. L. REV. 815, 829-33.

²⁰² Peirce, *supra* note 14.

A reactive approach to resolution-based regulation does not clearly apply to troubled systemically important markets. It is uncertain what it would mean to reorganize a troubled financial market, and the consequences of liquidating a financial market could be catastrophic. Proactive resolution, in contrast, is more clearly applicable.

2. *Proactive resolution.*

As adapted to financial markets, proactive resolution-based regulation would consist of pre-planned enhancements that are designed, at a time when a market's failure is merely a theoretical possibility, to strengthen the market or facilitate its resolvability if it becomes troubled. Conceptually, there are at least two possible approaches: to pre-plan enhancements that can make a troubled market become more internally robust,²⁰³ and to commit parties in advance to provide liquidity to support a market that becomes troubled.²⁰⁴

Pre-planning can make a troubled financial market become more internally robust by reducing its tight coupling.²⁰⁵ Financial markets today are tightly coupled in at least two ways. Computerized trading makes them especially susceptible to so-called “flash crashes,” in which high-speed automated trading inadvertently can cause extremely rapid (and in retrospect, irrational) price declines.²⁰⁶ Also, “mark-to-market” accounting, which requires that a securities account be adjusted in response to a change in the market value of the securities (ordinarily

²⁰³ Steven L. Schwarcz, *Perspectives on Regulating Systemic Risk*, in SYSTEMIC RISK, INSTITUTIONAL DESIGN, AND THE REGULATION OF FINANCIAL MARKETS 39, 45 (Anita Anand, ed., 2016) (describing the question of how regulation should require systemically important markets to become more internally robust as “important but only partly answered”).

²⁰⁴ *Id.*

²⁰⁵ Recall that tight coupling is the tendency of a failure in one part of a system to quickly lead to other failures. *See supra* note 185.

²⁰⁶ [cite]

reducing risk),²⁰⁷ can inadvertently cause fire sales²⁰⁸ that “distort value” during times of extreme market volatility.²⁰⁹

Regulatory pre-planning can reduce the tight coupling of systemically important financial markets that become troubled. For example, it can reduce the tight coupling of a flash crash by requiring systemically important markets to have so-called circuit breakers, which automatically suspend market trading if prices decline too rapidly—e.g., by more than a pre-set amount in less than a pre-set time span.²¹⁰ Regulatory pre-planning can also reduce the tight coupling of market-to-market accounting by suspending that accounting requirement in times of extreme market volatility.²¹¹

That pre-planning would require regulators to decide in advance—in many cases, on a market-by-market basis—what price declines would be too rapid,²¹² thereby justifying the

²⁰⁷ An investor, for example, may buy securities on credit from a securities broker-dealer, securing the purchase price by pledging the securities as collateral. To guard against the price of the securities falling to the point where their value as collateral is insufficient to repay the purchase price, the broker-dealer requires the investor to maintain a minimum collateral value. If the market value of the securities falls below this minimum, the broker-dealer will issue a “margin call” requiring the investor to deposit additional collateral, usually in the form of money or additional securities, to satisfy this minimum. Failure to do so triggers a default, enabling the broker-dealer to foreclose on the collateral. ZVI BODIE, ALEX KANE & ALAN J. MARCUS, *INVESTMENTS* 71–72 (8th ed. 2008). Marking to market is generally believed to reduce risk. *See, e.g.,* Gikas A. Hardouvelis & Panayiotis Theodossiou, *The Asymmetric Relationship Between Initial Margin Requirements and Stock Market Volatility Across Bull and Bear Markets*, 15 *REV. FIN. STUD.* 1525, 1554–55 (2002) (finding a correlation between higher margin calls and decreased systemic risk).

²⁰⁸ For example, a temporary fall in the price of certain securities can force the sale of those securities to generate cash; that forced sale in turn further drives down the price, which in turn requires more forced sales—and this reiterative process rapidly continues, resulting in a total collapse of the price of those securities. Anabtawi & Schwarcz, *supra* note 7, at 118–19.

²⁰⁹ *Id.*

²¹⁰ *Cf. id.* at 117 (“In the case of tight coupling . . . the focus would be on time – slowing or suspending a buildup of consequences.”). In response to a 2010 flash crash, the SEC investigated ways to design such circuit breakers. U.S. Securities and Exchange Commission, *Investor Bulletin: Measures to Address Market Volatility* (July 1, 2012) (informing investors of possible circuit breakers for markets for equity securities).

²¹¹ Anabtawi & Schwarcz, *supra* note 7, at 119.

²¹² *See supra* note 210 and accompanying text.

suspension of trading, and what would constitute extreme market volatility,²¹³ thereby justifying the suspension of mark-to-market accounting. In making these decisions, regulators would have to try to distinguish between short-term pricing fluctuations, potentially motivated by panic, automated trades, or other shocks, and pricing fluctuations that represent real changes in the value of the securities. The process by which regulators should make those decisions is beyond this Article’s scope.²¹⁴

Proactive resolution-based regulation can also strengthen and facilitate the resolvability of financial markets that become troubled by committing parties in advance to provide liquidity to stabilize market prices. For example, the internal regulations of some member-sponsored equity markets, such as the New York Stock Exchange,²¹⁵ impose liquidity requirements on their members.²¹⁶ Scholars are also examining the creation of partially privatized government liquidity facilities to support systemically important markets, by “purchasing market securities at prices that are below their intrinsic value but above then-current prices”²¹⁷ in order to “stabiliz[e] the price of distressed financial assets.”²¹⁸

C. Resolution-based Regulation of Systemically Important Infrastructure

1. *Reactive resolution.*

Because the systemically important infrastructure is, by definition, critical to the ongoing operation of the financial system,²¹⁹ any reactive resolution would need to occur immediately to prevent troubled infrastructure from failing. Negotiated resolution, as occurs in a bankruptcy case,²²⁰ would therefore likely be much too slow. More quickly acting regulatory interventions,

²¹³ See *supra* note 211 and accompanying text.

²¹⁴ The SEC’s initial circuit-breaker designs (see *supra* note 210) “failed miserably,” for example, to prevent an August 24, 2016 flash crash of exchange-traded funds. Vance Harwood, *ETF Flash Crashes Happen with Big Funds Too*, SIX FIGURE INVESTING (Dec. 6, 2016), available at <https://sixfigureinvesting.com/2015/08/secs-circuit-breakers-for-etf-etn-flash-crash/>.

²¹⁵ See https://www.nyse.com/publicdocs/nyse/markets/nyse/designated_market_makers.pdf.

²¹⁶ *Perspectives on Regulating Systemic Risk*, *supra* note 203, at 45.

²¹⁷ Anabtawi & Schwarcz, *supra* note 7, at 108–09.

²¹⁸ *Id.* at 107. Cf. Gordon & Muller, *supra* note 114 (making similar arguments).

²¹⁹ See *supra* notes 145-147 and accompanying text.

²²⁰ See *supra* note 50 and accompanying text.

perhaps similar to the OLA's reactive resolution of systemically important firms, could be more appropriate.

The OLA itself, however, is ill-fitted to resolving clearinghouses, which comprise a significant part of the systemically important infrastructure.²²¹ Among other limitations, the FDIC, which administers the OLA, “does not have experience regulating clearinghouses or the derivatives markets.”²²² Also, it is unclear whether the FDIC could find a large healthy clearinghouse to acquire a troubled clearinghouse. The limitations may be even worse for clearinghouses that constitute CCPs,²²³ which have balance sheets that are “quite different from those of other major types of systemically important financial institutions such as banks, broker-dealers, and insurance companies.”²²⁴

Professor Lubben has proposed an expedited regulatory intervention to nationalize clearinghouses on the brink of failure, wiping out “equity, memberships, and investor debt.”²²⁵ Previous clearinghouse members could continue clearing through the nationalized clearinghouse on a “fee for services basis.”²²⁶ Once the financial system stabilizes, the nationalized clearinghouse would issue “new memberships . . . in exchange for new contributions to the default fund and new capital commitments.”²²⁷ Nationalization, however, seems to be an overly draconian remedy that might even be unconstitutional.²²⁸

²²¹ See *supra* note 148 and accompanying text.

²²² Peirce, *supra* note 14, at [cite]. One scholar argues that the prominent role of the FDIC and the absence of the Commodity Futures Trading Commission (CFTC) in the OLA show that “Congress never intended OLA to apply to clearinghouses regulated under Dodd-Frank.” Stephen J. Lubben, *Failure of the Clearinghouse: Dodd-Frank's Fatal Flaw?*, 10 VA. L. & BUS. REV. 127, 151 (2015).

²²³ Cf. *supra* notes 151-152 and accompanying text (defining CCPs).

²²⁴ Duffie, *supra* note 144.

²²⁵ Stephen J. Lubben, *Nationalize the Clearinghouses!*, Seton Hall Public Law Research Paper No. 2458506 (June 24, 2014), at 31, available at: <http://ssrn.com/abstract=2458506> (arguing, *id.* at 30, that a federally chartered bridge institution should take over the troubled clearinghouse).

²²⁶ *Id.* at 31.

²²⁷ *Id.*

²²⁸ Cf. Duffie, *supra* note 144, at 104 (arguing that “An objective or requirement of some bankruptcy and failure resolution processes is that no creditor should be allocated greater losses than would have occurred in a counterfactual scenario in which the failing entity is simply liquidated. . . . Resolution processes that cause some creditors to lose more than they would have

2. Proactive resolution.

Proactive resolution, in contrast, should be especially appropriate for infrastructure to ensure the uninterrupted and ongoing operation of the financial system.²²⁹ Just as pre-planned liquidity can enable troubled systemically important firms to pay their debts²³⁰ and can stabilize prices in troubled financial markets,²³¹ it can also be used to stabilize troubled infrastructure—such as by enabling a financially troubled clearinghouse to pay its expenses. To this end, the Federal Reserve already has the power to provide discount-window lending, a form of liquidity, to clearinghouses and other FMUs “in unusual or exigent circumstances.”²³²

FMUs that have been designated as SIFMUs²³³ are already subject to proactive resolution-based regulation requiring them to prepare both a recovery plan and a wind-down plan.²³⁴ International regulators likewise want systemically important FMUs to plan how to try to recover, if they become troubled, and how to wind down if they fail to recover.²³⁵ These wind-down plans, and possible also the recovery plans, might be subject, however, to the same types of limitations that impact the effectiveness of living wills: it is difficult to accurately predict how a firm will fail, and planning to control the systemic contagion of a single firm’s winding down does not prevent the systemic contagion caused by multiple firms winding down concurrently.²³⁶

in a liquidation scenario, in order to reduce total social losses, would in this sense involve some sort of violation of property rights.”). My Article does not analyze whether that nationalization might violate the Fifth Amendment.

²²⁹ See *supra* note 219 and accompanying text. Cf. Hester Peirce, *Clearing the Way for Failure*, 64 CLEV. ST. L. REV. 589, 647 (2016) (arguing that the specter of CCP failure and the inability of firms to trade financial instruments covered by Dodd-Frank’s clearing mandate gives clearing members and regulators a strong interest in sustaining CCP services).

²³⁰ See *supra* notes 110-112 and accompanying text.

²³¹ See *supra* notes 215-218 and accompanying text.

²³² Peirce, *supra* note 229, at [cite].

²³³ See *supra* note 148.

²³⁴ Ryan, *supra* note 148, at 3.

²³⁵ *Id.* at 2 (discussing the Principles for Financial Market Infrastructures jointly issued in 2012 by the Committee on Payment and Market Infrastructure and the International Organization of Securities Commissions).

²³⁶ See *supra* notes 106-109 and accompanying text.

Private organizations have proposed what is effectively proactive resolution-based solutions to help protect FMUs that are CCPs. For example, the International Swaps and Derivatives Association²³⁷ has proposed a contractual solution that it calls variation margin gains haircutting, or “VMGH,”²³⁸ to prevent a CCP from defaulting after its other financial resources have been exhausted.²³⁹ At that time, the contract with its members would allow the CCP to “conserve or accumulate cash” by cancelling or reducing the margin payments that it would otherwise be required to make to its clearing members²⁴⁰ while collecting all of the margin payments that its members owe the CCP.²⁴¹ Some argue, however, that the VMGH approach could inadvertently amplify systemic risk. For example, by imposing “additional losses on [CCP] members, and likely their customers” during what would likely be a period of financial distress,²⁴² it could cause some of those firms to fail. Furthermore, by forcing customers “who expected cash payments . . . to liquidate assets in order to raise funds” to post their required margin payments, it “would depress the value of these assets and weaken the market, creating a pro-cyclical scenario that could further destabilize a collapsing market.”²⁴³

As an alternative to VMGH, investment bank JP Morgan Chase has proposed a form of privatized insurance that would be payable to help recapitalize a troubled CCP.²⁴⁴ Institutional investors could earn rents (in the form of insurance premiums) by providing such insurance.²⁴⁵

²³⁷ Cf. *supra* note 62 (discussing ISDA).

²³⁸ See International Swaps and Derivatives Association, Inc. (ISDA), *CCP Loss Allocation at the End of the Waterfall* (Aug. 2013), available at https://www2.isda.org/attachment/NTc5Nw==/CCP_loss_allocation_waterfall_0807.pdf (hereinafter “*CCP Loss Allocation*”).

²³⁹ *Id.* at 9.

²⁴⁰ Duffie, *supra* note 144, at 5.

²⁴¹ *CCP Loss Allocation*, *supra* note 238, at 9. Variation margin represents periodic (usually daily) payments or collateral transfers that offset risk of loss due to daily changes in the market value of the CCP members’ portfolios. Peirce, *supra* note 229, at 607.

²⁴² Lubben, *supra* note 222, at 153.

²⁴³ JP Morgan Chase & Co. Office of Regulatory Affairs, *What is the Resolution Plan for CCPs?* (Sep. 2014), available at <https://www.jpmorganchase.com/corporate/About-JPMC/document/resolution-plan-ccps.pdf>.

²⁴⁴ *See id.*

²⁴⁵ Duffie, *supra* note 144, at 99.

This would also incentivize the institutions providing the insurance to take on an outside monitoring role.²⁴⁶

The European Union, in contrast, is implementing a proactive resolution-based regulatory approach to protecting CCP infrastructure. Its European Market Infrastructure Regulation requires “at least two CCPs clearing a particular asset class for the clearing obligation to be imposed.”²⁴⁷ Therefore, if one CCP fails, at least another CCP should be available to perform the clearing function. Although that regulation does not solve the problem of correlated CCP failures, it arguably increases the robustness of the clearing process.²⁴⁸ For example, assume that same regulation applied in the United States to the Dodd-Frank Act requirement that certain standardized derivative instruments be cleared through a CCP.²⁴⁹ In the event the CCP fails, derivatives could still be cleared—either through another CCP or even without using a CCP.²⁵⁰

The above approaches address CCPs and some of the largest FMUs,²⁵¹ but they largely neglect other FMUs that are part of a holding company structure that exposes them to affiliate

²⁴⁶ Peirce, *supra* note 229, at 655. That alternative is similar to the partly privatized liquidity facilities discussed *supra* notes 217-218 and accompanying text.

²⁴⁷ World Federation of Exchanges, *The Interplay Between Central Counterparty (CCP) Recovery and Resolution: A Global Perspective*, (Feb. 2017), at 5, available at <https://www.world-exchanges.org/home/index.php/news/world-exchange-news/world-federation-of-exchanges-publishes-white-paper-on-ccp-recovery-resolution>.

²⁴⁸ I say “arguably” because the European Market Infrastructure Regulation does not actually require the creation of multiple CCPs; it merely suspends the obligation that clearing occur through a CCP if only one CCP remains. [cite]

²⁴⁹ This clearing mandate is meant to reduce systemic risk. *See, e.g., Ernst & Young, Dodd-Frank’s Title VII – OTC derivatives reform*, at 1, available at [http://www.ey.com/Publication/vwLUAssets/Key_questions_board_members_should_ask_about_Title_VII/\\$FILE/Americas_FAAS_Dodd_Frank_derivatives_reform.pdf](http://www.ey.com/Publication/vwLUAssets/Key_questions_board_members_should_ask_about_Title_VII/$FILE/Americas_FAAS_Dodd_Frank_derivatives_reform.pdf).

²⁵⁰ *Cf. Peirce, supra* note 229, at 627 (in the case of a CCP failure, “there might not be a substitute CCP, so the market for any OTC derivatives cleared at the failing CCP and subject to the clearing mandate would lock up”). *But cf. World Federation of Exchanges, supra* note 247, at 7 (“Given the significant effect of such an event, if it were to occur it is quite possible also that the market itself would no longer be viable because of the likely drain on liquidity from those players exiting As such, it is not obvious to us that suspension of the clearing mandate is a necessary – or even helpful – step during a CCP’s resolution.”).

²⁵¹ *Cf. supra* note 148 (discussing SIFMUs).

financial and operating risks.²⁵² Proactive resolution-based regulation could be designed to protect those FMUs through ring-fencing which, in relevant part, protects a firm from becoming subject to liabilities and other risks associated with the bankruptcy of affiliates; helps ensure that a firm is able to operate on a standalone basis even if its affiliated firms fail; and protects a firm from being taken advantage of by affiliated firms, thereby preserving the firm’s business and assets.²⁵³ Because it is costly, ring-fencing is most commonly used to protect monopoly or semi-monopoly entities (which thus have few if any substitutes) that provide essential public services, such as public utilities that produce and disseminate electric energy.²⁵⁴ This is especially valuable where the utility is part of a holding company structure that exposes it to non-utility risk; insulation of the utility from that risk helps to assure unimpaired continuation of the public services.²⁵⁵

FMUs fit that pattern if they are in a holding company structure that exposes them to other risk. Like public utilities, FMUs provide essential public services (by ensuring the ongoing operation of the financial system). Also like public utilities, FMUs have few if any substitutes; indeed, they are often the only entity able to perform clearing and settlement services.²⁵⁶

For example, ICE Clear Credit, an FMU that provides central counterparty clearing services for CDS derivatives, is an indirect subsidiary of Intercontinental Exchange, Inc.²⁵⁷ Intercontinental Exchange, Inc. engages in an aggressive acquisition strategy²⁵⁸ that has caused it to incur significant debt,²⁵⁹ and “[m]any aspects of [its] business [also] involve substantial risks

²⁵² See *supra* notes 155-156 and accompanying (discussing FMU exposure to affiliate risks).

²⁵³ See Steven L. Schwarcz, *Ring-Fencing*, 87 S. CAL. L. REV. 69, 81-82 (2013).

²⁵⁴ *Id.* at 104.

²⁵⁵ *Id.* at 74.

²⁵⁶ See, e.g., FIN. STABILITY OVERSIGHT COUNCIL, at 157, 160, 174 (2012).

²⁵⁷ *Id.* at 172.

²⁵⁸ 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.”).

²⁵⁹ See *id.* at 31 (“Following our acquisition of NYSE and Interactive Data, we have a significant amount of indebtedness outstanding on a consolidated basis.”).

of liability.”²⁶⁰ Ring-fencing ICE Clear Credit would help to protect it from its parent company’s financial and operating risks,²⁶¹ thereby assuring the continuing performance of the FMU’s clearing services even if the parent fails.²⁶²

CONCLUSION

In response to the global financial crisis, regulators and policymakers have been shifting their focus from microprudential regulation, which is intended to protect individual firms, to macroprudential regulation which protects the stability of the financial system itself. Frustrated that they have made little progress in figuring out how to prevent another crisis, regulators are now trying to apply bankruptcy “resolution” techniques to help stabilize the financial system. To date, however, their efforts have been insufficient, in part because bankruptcy law traditionally has microprudential goals whereas protecting financial stability is a macroprudential goal.

This Article seeks to derive a logical and consistent theory of how and why resolution-based regulation can help to stabilize the financial system. To that end, the Article identifies three possible regulatory approaches: reactive resolution-based regulation, which comprises

²⁶⁰ *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 . . .”).

²⁶¹ The actual mechanics of ring-fencing an FMU are beyond this Article’s scope because they would be highly fact dependent. In general, though, they would likely include pre-planning protections that make the FMU bankruptcy remote from its affiliates and able to operate on a standalone basis if the affiliates fail. *Cf. Ring-Fencing, supra* note 253, at 74 (explaining how ring-fencing can help to protect the continuing functioning of a utility within a holding company structure).

²⁶² Ring-fencing might also be considered for the most critically systemically important FMUs, even if their affiliate risk is small. For example, CME Clearing, an FMU that clears the vast majority of the market 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 256, at 157. Ring-fencing CME Clearing could help to insulate it from the exchange-related risks, thereby assuring unimpaired continuation of its clearing services in the unlikely event that the exchange fails.

variations on traditional bankruptcy; proactive resolution-based regulation, which consists of pre-planned enhancements that are designed to strengthen or facilitate the resolvability of financial system elements that become troubled; and counteractive regulation, which seeks to reduce the need for resolution (and thus is not truly resolution).²⁶³

The Article then argues that resolution-based regulation should seek not merely (as currently conceived) to protect individual troubled systemically important firms but also to protect against the failure of systemically important firms in the aggregate as well as to protect other critical elements of the financial system. These include the markets in which securities and other financial assets are traded and the infrastructure that serves to facilitate that trading. Finally, the Article applies these insights to design resolution-based regulation that can be used by regulators as an additional macroprudential “tool.”²⁶⁴

This Article’s analysis should be applicable to designing macroprudential resolution-based regulation both domestically and abroad. The Article does not examine, however, the cross-border recognition or integration of any given nation’s resolution-based regulatory approaches. The Lehman Brothers bankruptcy illustrated that the efficient cross-border resolution of a large globally integrated systemically important firm requires significant international coordination, making that an important subject for further study.²⁶⁵

²⁶³ Cf. *supra* note 119 (discussing an intuitive way to distinguish these regulatory approaches).

²⁶⁴ Cf. *supra* note 6 (discussing the so-called macroprudential regulatory toolkit).

²⁶⁵ The author has separately examined cross-border recognition of resolution approaches. See Steven L. Schwarcz et al., Comments on behalf of the Centre for International Governance Innovation, on the [Financial Stability Board]’s September 29, 2014 Consultative Document, “Cross-Border Recognition of Resolution Action,” available at <http://www.cigionline.org/sites/default/files/no.51.pdf>. A group of U.S. and international bankruptcy and financial regulation scholars, including the author, has also been analyzing the cross-border integration of resolution approaches. See Financial Scholars Letter, *supra* note 52, at 3. Among other things, that letter argues that courts are likely to “lack deep prior relationships or the authority to reach understandings with foreign regulators in advance of a bankruptcy filing,” thereby “increas[ing] the likelihood that foreign regulators or foreign courts, at the behest of local interests, will seize assets [of the global systemically important firm] within their jurisdiction.” *Id.* Just as that type of “grab race” is thought to undermine the effectiveness of a domestic firm’s resolution, it is “likely to be the death-knell of a successful” resolution of a global systemically important firm. *Id.*

APPENDIX
Regulatory Design Recommendations

This Appendix summarizes the Article’s design recommendations based on examining how “macroprudential” resolution-based regulation could protect not only systemically important firms but also systemically important financial markets and infrastructure.

Resolution-based regulation of systemically important firms:

Resolution-based regulation should not be limited, as under existing law, to protecting systemically important firms that individually become troubled. The financial crisis showed that multiple systemically important firms can become troubled around the same time,²⁶⁶ requiring a more aggregate and coordinated response than is feasible in judicial bankruptcy cases.²⁶⁷ Regulator-supervised resolution could help to provide that response, but regulators would likely have less resolution expertise than bankruptcy judges. To remedy that, bankruptcy judges could be assigned as supervisors of the regulatory procedures.²⁶⁸

“DIP” financing will be necessary to enable multiple troubled systemically important firms to continue operating for the length of time needed to reorganize their capital structure. If private sources are inadequate, the government could consider providing—and thus an appropriate government agency should at least be authorized to provide—this financing.²⁶⁹

To reduce the interactive complexity that can cause unpredictable counterparty behavior, systemically important firms could be required to disclose to their counterparties—at least periodically, if not also on demand—the amount and identity of their securities holdings²⁷⁰ as

²⁶⁶ See *supra* notes 108-109 and accompanying text.

²⁶⁷ See text accompanying notes 168-169, *supra*.

²⁶⁸ See text accompanying notes 168-176, *supra*.

²⁶⁹ See text accompanying notes 177-181, *supra*.

²⁷⁰ See text accompanying notes 192-193, *supra*.

well as the precise amount and nature of their contractual obligations (especially for contingent obligations on derivatives contracts).²⁷¹

To prevent systemically important firms from defaulting and rapidly spreading financial panic, central banks could consider providing—and thus at least should be authorized to provide—last-resort lending to such firms, especially to firms that are illiquid but solvent (and thus ultimately able to repay the loan).²⁷²

Resolution-based regulation of systemically important financial markets:

The existing focus of resolution-based regulation on troubled systemically important firms obscures the importance of also using resolution-based regulation to protect other critical elements of the financial system whose failure could trigger a systemic collapse. These include the markets in which securities and other financial assets are traded.

To prevent the collapse of systemically important financial markets that become troubled, regulation could require circuit breakers that automatically suspend market trading if prices decline too rapidly.²⁷³ Similarly, regulation could suspend mark-to-market accounting in systemically important markets that become subject to extreme volatility.²⁷⁴

Regulation could also create liquidity facilities to purchase securities in troubled systemically important markets at prices that are below their intrinsic value but above then-current prices. This would help to stabilize the price of distressed financial assets at non-panic levels.²⁷⁵ Although these liquidity facilities could be governmental, they might also be partly privatized.²⁷⁶

Resolution-based regulation of systemically important financial infrastructure:

²⁷¹ See text accompanying notes 194-200, *supra*.

²⁷² See text accompanying notes 200-201, *supra*.

²⁷³ See text accompanying notes 209-211, *supra*.

²⁷⁴ See *id.*

²⁷⁵ See text accompanying notes 215-218, *supra*.

²⁷⁶ See *id.*

The financial infrastructure that serves to clear and settle the trading of securities and other financial assets constitutes another critical element of the financial system whose failure could trigger a systemic collapse. Governments and private organizations have been considering, at least implicitly, how resolution-based regulation could protect parts of this infrastructure. However, they have largely ignored the need to protect financial infrastructure from undue exposure to affiliate risks. Resolution-based regulation could provide that protection by ring-fencing the infrastructure and making it bankruptcy-remote.²⁷⁷

²⁷⁷ See text accompanying notes 251-262, *supra*.