BEYOND BANKRUPTCY: RESOLUTION AS A MACROPRUDENTIAL REGULATORY TOOL

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Postcrisis efforts to extend bankruptcy-resolution techniques to protect the stability of the financial system have been insufficient, in part because regulators have been conflating bankruptcy's traditional goals of resolving troubled firms individually with the need to resolve critical elements of the financial system to ensure its continued operation as a "system." This requires resolving troubled firms collectively, as well as resolving securities-trading markets and the infrastructure that serves to facilitate that trading. The Article examines how to design that regulation, differentiating three approaches: reactive regulation, which comprises variations on traditional bankruptcy; proactive regulation, which consists of preplanned enhancements that are designed to strengthen or facilitate the resolvability of financial system elements that start to become troubled; and counteractive regulation, which seeks to reduce the need for resolution (and thus is not truly resolution).

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INTRODUCTION

Since the global financial crisis of 2008 and 2009 (the "financial crisis"), regulators and policymakers have been shifting their focus from traditional microprudential regulation, which protects individual banks and other financial firms,[1] to "macroprudential" regulation that protects the stability of the

1 *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.*, Dennis Lockhart, President & Chief Exec. Officer, Fed. Reserve Bank of Atlanta, Speech at the University of Georgia Law Review Symposium: Thoughts on Prudential Regulation of Financial Firms (Mar. 20, 2015), https://www.frbatlanta.org/news/speeches/2015/150320-lockhart.aspx (defining prudential regulation as "regulation focused on the safety and soundness of individual institutions").

financial system itself.[2] Because macroprudential regulation is still very much in the process of developing,[3] its specific measures are viewed as "tools" in a regulatory "toolkit."[4]

In designing macroprudential regulation, regulators originally focused on trying to deter events that might trigger financial destabilization.[5] It is not always clear, however, what those events are or how they could be deterred.[6] For example, the Dodd-Frank Act seeks to dampen overheated mortgage lending, one of the events that triggered the financial crisis.[7] 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.[8]

Likewise, current regulatory efforts to deter excessive risk-taking by systemically important financial firms ("systemically important firms")[9] are

2 *See, e.g.*, Gohari & Woody, *supra* note 1, at 403–06; Daniel K. Tarullo, Member, Bd. of Governors of the Fed. Reserve Sys., Speech at the Yale Law School Conference on Challenges in Global Financial Services: Macroprudential Regulation (Sept. 20, 2013), https://www.federalreserve.gov/newsevents/speech/files/tarullo20130920a.pdf; Luis I. Jácome & Erlend W. Nier, *Macroprudential Policy: Protecting the Whole*, Int'l Monetary Fund (Mar. 2012), http://www.imf.org/external/pubs/ft/fandd/basics/macropru.htm.

3 *Cf. infra* note 16 and accompanying text (observing that regulators themselves admit that current macroprudential regulation may be inadequate).

4 *See, e.g.*, Int'l Monetary Fund, Implementing Macroprudential Policy—Selected Legal Issues 11 (2013), 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 "toolkit." *See, e.g.*, Christopher S. Dwight, Note, *Missed (Inter)Connections: Proposed Revisions to the Federal Reserve's Approach to Financial Stability Analysis Under the Bank Holding Company Act*, 18 N.C. Banking Inst. 599, 614 (2014); Gohari & Woody, *supra* note 1, at 404–05; Dan Awrey & Katharina Pistor, An Overview of the Legal Theory of Finance 2 (2014) (unpublished manuscript), http://blogs.law.columbia.edu/global-legal-transformation/files/2016/04/LTF-memo-2014.pdf; *cf.* Kern Alexander & Steven L. Schwarcz, *The Macroprudential Quandary: Unsystematic Efforts to Reform Financial Regulation*, *in* Reconceptualising Global Finance and its Regulation 127, 130–32 (Ross P. Buckley et al. eds., 2016) (arguing that the toolkit analogy reflects an ad hoc approach that does not yet fully protect financial stability).

5 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.

6 *Id.* 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).

7 *See, e.g.*, Bradley K. Sabel, *Mortgage Lending Practice After the Dodd-Frank Act*, Harv. L. Sch. F. on Corp. Governance & Fin. Reg. (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).

8 *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/.

9 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

questionable. Although that risk-taking was a trigger of the financial crisis[10] and appears to be a continuing threat to financial stability,[11] regulators remain uncertain how to control it.[12] Their deterrent efforts focus on politically appealing factors such as reducing moral hazard and aligning managerial and investor interests.[13] But attributing excessive risk-taking to moral hazard is unsupported by hard evidence and inconsistent with management incentives;[14] and aligning managerial and investor interests 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.[15]

Frustrated that they "have made little progress in figuring out how they might actually" prevent another financial crisis,[16] regulators have been

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*, WALL ST. J.: THE SHORT ANSWER (Mar. 30, 2016, 1:33 PM), http://blogs.wsj.com/briefly/2016/03/30/what-you-need-to-know-about-sifis-the-short-answer/ (quoting Dodd-Frank Wall Street Reform and Consumer Protection Act, § 113, 12 U.S.C. § 5323 (2012)). SIFIs are subject to enhanced supervision by regulators.

10 *See, e.g.*, U.S. FIN. CRISIS INQUIRY COMM'N, THE FINANCIAL CRISIS INQUIRY REPORT xviii–xx (2011) (identifying excessive risk-taking by systemically important firms as a primary cause of the financial crisis); Jacob J. Lew, *Let's Leave Wall Street's Risky Practices in the Past*, WASH. POST (Jan. 9, 2015), https://www.washingtonpost.com/opinions/jacob-lew-lets-leave-wall-streets-risky-practices-in-the-past/2015/01/09/cf25b5f6-95d8-11e4-aabd-d0b93ff613d5_story.html?noredirect=on&utm_term=.3b91d77fefbf (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/schools brief/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").

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

12 *Cf.* Timothy F. Geithner, *Are We Safe Yet?: How to Manage Financial Crises*, FOREIGN AFF. (Dec. 12, 2016), https://www.foreignaffairs.com/articles/united-states/2016-12-12/are-we-safe-yet ("Although regulations [imposing specific requirements] have reined in banks' risk-taking behavior, they can go only so far."); Hester Peirce, *Clearing, Recovering, and Resolving*, BROOKINGS (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).

13 *See* Steven L. Schwarcz, *Too Big to Fool: Moral Hazard, Bailouts, and Corporate Responsibility*, 102 MINN. L. REV. 761 (2017). 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 764.

14 *Id.* at 765–69.

15 *Id.* at 769.

16 Binyamin Appelbaum, *Policy Makers Skeptical on Preventing Financial Crisis*, N.Y. TIMES (Oct. 4, 2015), https://www.nytimes.com/2015/10/05/business/economy/policy-makers-skeptical-on-preventing-financial-crisis.html (reporting the consensus view of an international conference of regulators at the Federal Reserve Bank of Boston). Donald Kohn,

expanding their macroprudential focus to include bankruptcy "resolution" techniques designed to reorganize the capital structure of,[17] or else to liquidate with minimal systemic impact, systemically important firms that become financially troubled.[18] To date, however, regulatory efforts to use those techniques to try to protect financial stability have been inadequate,[19] in part because bankruptcy law[20] traditionally has microprudential goals—to protect individual firms that are financially troubled but otherwise viable[21]—whereas protecting financial stability is a macroprudential goal.[22] Much of the cur-

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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.*

17 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).

18 *See, e.g.*, Peter O. Mülbert, *Managing Risk in the Financial System*, *in* THE OXFORD HANDBOOK OF FINANCIAL REGULATION 364, 384 (Niamh Moloney et al. 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); Daniel K. Tarullo, Member, Bd. of Governors of the Fed. Reserve Sys., Speech at the Woodrow Wilson School, Princeton University: Departing Thoughts (Apr. 4, 2017) (calling the "the need for credible resolution mechanisms for large banks" an "important topic[ ]"); E-mail from Paul Tucker, Senior Fellow, Harvard Bus. Sch., 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.* FIN. STABILITY BD., KEY ATTRIBUTES OF EFFECTIVE RESOLUTION REGIMES FOR FINANCIAL INSTITUTIONS § 3.1 (2014), 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").

19 *See infra* notes 3–7 and accompanying text.

20 References in this Article to bankruptcy law, the term used in the United States, include insolvency law, which is the term often preferred abroad. *See, e.g.*, Věra Jourová, Speech at the European Commission: Insolvency Law in Europe—Giving People and Businesses a Second Chance (Apr. 23, 2015), https://ec.europa.eu/commission/commissioners/2014-2019/jourova/announcements/insolvency-law-europe-giving-people-and-businesses-second-chance_en.

21 *See supra* notes 17–18 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 5 (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.

22 *Cf. supra* notes 1–2 and accompanying text (describing those regulatory goals).

rent 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.[23] Regulation based on that assumption, however, can overlook correlations among systemically important firms[24] and can sometimes even reduce financial stability.[25] 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.[26] Even the Dodd-Frank Act's Orderly Liquidation Authority, which applies bank receivership to resolving nonbank systemically important firms, is inherently microprudential.[27]

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 regulation ("resolution-based regulation")[28] 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 collectively. 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.[29]

Part III analyzes how to design resolution-based regulation to achieve those goals,[30] using insights gleaned from recognizing that the financial sys-

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

24 *See infra* note 158 and accompanying text.

25 *See infra* Section II.A.

26 *See infra* notes 45–48 and accompanying text.

27 *See infra* notes 49–59 and accompanying text.

28 In accordance with customary bankruptcy usage, *see supra* notes 17–18 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 53 and accompanying text.

29 *See infra* Section II.B.

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

tem 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, Section III.A 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. Section III.B explains how resolution-based regulation could reduce tight coupling by authorizing central bank last-resort lending to protect illiquid but solvent systemically important firms[31] as well as to prevent financial market panics.

Finally, Section III.C 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. This Section 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."[32] Except as specifically discussed,[33] the Article does not purport to critique, much less criticize, non-resolution-based macroprudential regulation.[34] 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 microprudential resolution-based regulation. Such regulation has its own merits and can valuably complement macroprudential regulation.[35]

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31 In the United States, for example, this would require rescission of the Dodd-Frank Act's misguided limitation of the Federal Reserve's emergency lending authority. *See infra* notes 115–16 and accompanying text.

32 *See supra* note 4 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 24–27 and accompanying text.

33 *See supra* notes 5–15 and accompanying text.

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

35 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 system-

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.[36] 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.[37] 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.[38] 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

In principle, reactive resolution can apply to any troubled firm, even a troubled systemically important firm.[39] Corporate bankruptcy law, for example, enables firms to restructure unsustainable debt burdens, such as by reducing the principal and interest on their debt and extending its maturities.[40] So long as the firm has an inherently good business model,[41] the debt

ically important firms is a macroprudential goal. *See* Steven L. Schwarcz, *Misalignment: Corporate Risk-Taking and Public Duty*, 92 NOTRE DAME L. REV. 1 (2016).

36 These approaches are, of course, generalizations; there is some potential overlap.

37 *See supra* notes 17–18 and accompanying text.

38 In the United States, for example, bankruptcy is governed by Title 11 of the U.S. 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 ET AL., BANKRUPTCY 3–4 (1993).

39 *Cf.* 11 U.S.C. § 109 (2012) (not limiting debtors under U.S. bankruptcy law to non-systemically important firms).

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

41 Commentators sometimes refer to such a firm as "good company, bad balance sheet." *See* FITCH INV'RS SERV., DEBTOR-IN-POSSESSION LOAN RATING CRITERIA 4 (Mar. 25, 1991) (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.*

restructuring would give it a "fresh start."[42] The bankruptcies of General Motors and Chrysler broadly followed this restructuring approach.[43]

For at least two reasons, though, traditional bankruptcy may be insufficient to protect financial stability. First, bankruptcy law focuses on protecting individual firms, not on protecting the financial system.[44] Its focus is therefore 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.[45] That concern has prompted proposals to amend bankruptcy law to better adapt it to those types of firms. To this end, the Hoover Institution has proposed adding a new chapter 14 to the Bankruptcy Code[46] and Congress has been considering a proposed Financial Institutions Bankruptcy Act.[47] These proposed changes to bankruptcy law nonetheless remain microprudential, following the traditional approach of negotiating an individual firm's debt restructuring.[48]

Another approach to reactive resolution is epitomized by the Orderly Liquidation Authority (OLA),[49] which contemplates a regulatory supervised

42 Although the term "fresh start" is more commonly used for individuals rather than corporations, it is helpfully illustrative in this Article's context.

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

44 *Cf.* Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Reserve Sys., Speech at the Federal Reserve Bank of Boston 54th Economic Conference: Financial Regulation and Supervision After the Crisis: The Role of the Federal Reserve (Oct. 23, 2009), 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").

45 *Cf. infra* notes 149–54 and accompanying text (discussing the Lehman bankruptcy).

46 *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), 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 . . . .").

47 The Financial Institutions Bankruptcy Act of 2017 was introduced in the House of Representatives in March 2017 under H.R. 1667 to include a new financial institutions bankruptcy subchapter V to chapter 11 of the U.S. Bankruptcy Code. The Financial Institutions Bankruptcy Act of 2017, H.R. Res. 1667, 115th Cong. (2017).

48 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 Reorganization in Bankruptcy, in* BANKRUPTCY: A SPECIAL COLLECTION FROM THE JOURNAL OF COMMERCIAL BANK LENDING 79, 79–80 (1987).

49 The OLA was created under Title II of the Dodd-Frank Act. *See* 12 U.S.C. §§ 5381–5394 (2012).

proceeding.[50] The OLA empowers the Federal Deposit Insurance Corporation (FDIC) to put certain large, troubled financial institutions into FDIC receivership.[51] The justification for the OLA is somewhat path dependent: because FDIC receivership had been used successfully for decades as a scheme for resolving insolvent banks,[52] it should be extended to troubled nonbanks.[53]

The OLA has been criticized as being neither transparent nor predictable, with the potential to increase moral hazard. The OLA is an "opaque process . . . giv[ing] unprecedented discretionary power to the [FDIC] to render critical judgments without explanation or even a record or forum for disputes."[54] It is unpredictable because the FDIC can "treat similarly situated creditors dissimilarly."[55] Like the proposed changes to bankruptcy law, the OLA is inherently microprudential because it focuses on protecting individual firms.[56] Furthermore, the success of FDIC receivership historically has depended on larger healthy banks acquiring troubled banks.[57] If a large

50 Although beyond this Article's scope, some fear that the proposals to amend bankruptcy law could undercut the OLA. *Supra* notes 46–47 and accompanying text. For example, the proposed Financial CHOICE Act would repeal the OLA and substitute for it a Financial Institutions Bankruptcy Act. *See* Letter from Jeffrey N. Gordon et al., to the House Fin. Servs. Comm. et al., (May 23, 2017), https://www.law.columbia.edu/sites/default/files/microsites/law-economics-studies/scholars_letter_on_ola_-_final_for_congress.pdf [hereinafter "Financial Scholars Letter"].

51 Kwon-Yong Jin, Note, *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 (2015). The OLA gives the FDIC "extensive latitude in managing the company." *Id.* 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 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 (footnotes omitted).

52 Banks are exempted from corporate bankruptcy law. *See* 11 U.S.C. § 109(b)(2) (2012).

53 At least part of the impetus for creating the OLA might also 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.

54 Stephen E. Hessler, *A Better Idea for Bankrupt Big Banks*, WALL ST. J. (Apr. 24, 2017), https://www.wsj.com/articles/a-better-idea-for-bankrupt-big-banks-1493075498.

55 *Id.* (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).

56 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.

57 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 transaction. FED. DEPOSIT INS. CORP., MANAGING THE CRISIS: THE FDIC AND RTC EXPERIENCE 1980–1984, at 55–56 (1998). In the second option, called open bank assistance, the FDIC lends money to the troubled bank.

financial firm becomes troubled, there may not always be a larger healthy financial firm available to acquire the troubled firm.[58] 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."[59] This scarcity of eligible acquiring firms would become especially critical if multiple financial firms become troubled around the same time.

The requirement in the Dodd-Frank Act that certain systemically important firms must file so-called living wills represents yet another form of reactive resolution-based regulation.[60] A living will is a resolution plan setting forth how the firm could liquidate with minimal systemic impact if it becomes financially troubled.[61] Although this requirement is intended to protect financial stability without needing a bailout,[62] it might not completely eliminate that 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.[63] The financial crisis demonstrated that a concurrence of failures is likely when the causes of the failures are interconnected, such as widespread investor overre-

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Open bank assistance 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.*

58 *Cf.* Stephen J. Lubben, *Resolution, Orderly and Otherwise: B of A in OLA*, 81 U. CIN. L. REV. 485, 510 (2012) (questioning "whether the analogy that Dodd-Frank 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 purchase and assumption transaction] with regard to a large financial institution." *Id.*

59 *Id.*

60 Although living wills might appear to be proactive because they 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, they are more properly categorized as reactive because they only contemplate liquidation and do not provide preplanned enhancements.

61 *See, e.g.*, Jennifer Meyerowitz & Joseph N. Wharton, *A Dodd-Frank Living Wills Primer: What You Need to Know Now*, AM. BANKR. INST. J., Aug. 2012, at 34, 34 ("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) (quoting Dodd-Frank Act § 165(d), 12 U.S.C. § 5365(d) (2012))).

62 *Cf.* Clay R. Costner, Note, *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).

63 *Cf.* Victoria McGrane, *FDIC Chief Martin Gruenberg: Big Bank Failure Won't Imperil System*, WALL ST. J. (May 11, 2015), https://www.wsj.com/articles/fdic-chief-martin-gruenberg-big-bank-failure-wont-imperil-system-1431386899 (observing that some in Congress "doubt regulators could handle the failure of multiple major firms at the same time").

liance on subprime mortgage loans as a source of payment and on the reliability of credit ratings.[64]

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, albeit 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.[65] This safe harbor epitomizes how regulatory confusion over cause and effect, in this case influenced by a powerful industry trade group,[66] can actually increase systemic risk.[67]

In contrast to rights of other creditors, the safe harbor allows derivatives counterparties "virtually unlimited enforcement rights against the debtor"[68]

64 Steven L. Schwarcz, Essay, *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, Bd. of Governors of the Fed. Res. Sys, Speech at the Annual Meeting of the National Association for Business Economics: Macroprudential Supervision and Monetary Policy in the Post-Crisis World (Oct. 11, 2010), https://www.federalreserve.gov/newsevents/speech/yellen20101011a.htm (attributing the financial crisis to concurrences of interrelated failures).

65 *See* Steven L. Schwarcz & Ori Sharon, *The Bankruptcy-Law Safe Harbor for Derivatives: A Path-Dependence Analysis*, 71 WASH. & LEE L. REV. 1715, 1754 (2014).

66 *See id.* at 1741–42 (discussing the powerful lobbying influence of the International Swaps and Derivatives Association (ISDA)).

67 *See supra* text accompanying notes 24–25.

68 Steven L. Schwarcz, *Derivatives and Collateral: Balancing Remedies and Systemic Risk*, 2015 U. ILL. L. REV. 699, 700. 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 J. Roe, *The Derivatives Market's 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 ISDA 2014 Resolution Stay Protocol*, INT'L SWAPS & DERIVATIVES ASS'N (Nov. 12, 2014), https://www.isda.org/protocol/isda-2014-resolution-stay-protocol/. 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." 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*, FUTURES & DERIVATIVES L. REP., Apr. 2015, at 1, 5 (arguing that these stays are "a cornerstone of a resolution authority's ability to preserve a failed SIFI as a going concern"); *cf.* Irit Mevorach, *Beyond the Search for Certainty: Addressing the Cross-Border Resolution Gap*, 10 BROOK. J. CORP. FIN. & COM. 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).

on the supposition that such rights are "necessary to protect against systemic risk."[69] Ironically, as explained below, those rights can amplify systemic risk.[70]

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."[71] That concentration "can spread a chain of defaults among financial institutions."[72] The safe harbor can also amplify systemic risk by undermining market discipline; derivatives counterparties "know that they often enough will be paid even if their [debtor] counterparty fails."[73] Professor Mark Roe believes that such lack of market discipline increased systemic harm from the failures of Bear Stearns and Lehman Brothers during the financial crisis.[74] 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.[75] That can inadvertently force the liquidation of an otherwise viable systemically important firm.[76]

B. Proactive Resolution

Some resolution-based regulation is "proactive" in the sense that it consists of preplanned 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 starts to become 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."[77] Given the inevitability of failure, the most successful (complex) systems are "those in which the consequences of failure are limited."[78]

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."[79] This "helps to reduce the chance that a failure in one part of [the] system will systemically trigger [a] failure in another part."[80] I have separately argued

69 Schwarcz, *supra* note 68, at 700.

70 *Id.* at 708.

71 *Id.*

72 *Id.*

73 Roe, *supra* note 68, at 542.

74 *See id.* at 549–55.

75 Schwarcz, *supra* note 68, at 712.

76 *See id.* at 713.

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

78 *Id.*

79 *Id.* (emphasis omitted) (quoting Henry E. Smith, *Modularity in Contracts: Boilerplate and Information Flow*, 104 MICH. L. REV. 1175, 1180 (2006)).

80 *Id.*

that chaos theory should apply equally to the problem of inevitable systemic shocks in the complex financial system.[81] 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 three 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.

Different iterations of this approach have been referred to as total loss-absorbing capacity (TLAC) and contingent convertible securities ("CoCos").[82] 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 preset conditions.[83] Conversion would reduce the firm's indebtedness, thereby (hopefully) making the firm financially viable again.[84] 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,[85] which could reduce the firm's risk-taking.[86]

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81 *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).

82 *Cf.* Single Resolution Bd., *MREL: Approach Taken in 2016 and Next Steps*, at 8–9 (2016), 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").

83 *See, e.g.*, Edward Simpson Prescott, *Contingent Capital: The Trigger Problem*, 98 ECON. Q. 33 (2012); Erica Jeffery, *TLAC: What You Should Know*, EUROMONEY (Mar. 15, 2017), https://www.euromoney.com/article/b12kl97jn3mk69/tlac-what-you-should-know (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"); *see also* 80 Fed. Reg. 74,926 (proposed Nov. 30, 2015) (to be codified at 12 C.F.R. pts. 217, 252); Press Release, Bd. of Governors of the Fed. Reserve Sys, Federal Reserve Board Proposes New Rule to Strengthen the Ability of Largest Domestic and Foreign Banks Operating in the United States to Be Resolved Without Extraordinary Government Support or Taxpayer Assistance (Oct. 30, 2015), https://www.federalreserve.gov/newsevents/pressreleases/bcreg20151030a.htm.

84 *See* JIANPING ZHOU ET AL., FROM BAIL-OUT TO BAIL-IN: MANDATORY DEBT RESTRUCTURING OF SYSTEMIC FINANCIAL INSTITUTIONS, INTERNATIONAL MONETARY FUND [IMF] (Apr. 24, 2012), http://www.imf.org/external/pubs/ft/sdn/2012/sdn1203.pdf.

85 Emilios Avgouleas & Charles Goodhart, *Critical Reflections on Bank Bail-Ins*, 1 J. FIN. REG. 3, 4–5 (2015).

86 This monitoring aspect is counteractive because it is designed to reduce the need for resolution. *See supra* note 35 and accompanying text.

CoCos have been issued in Europe,[87] 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 as planned to prevent the bank's failure.[88] 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.[89] Although there are ways to try to distinguish these cases,[90] some argue they reflect the inevitable failure of CoCos as a viable resolution option.[91] Additional questions remain regarding the actual implementation of a CoCo conversion policy, such as what should trigger the debt to convert[92] and how to ensure that creditors holding convertible debt are compensated without making the debt too costly.[93] A recent study even

87 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 prevent a failure. *See* Fin. Stability Bd., *Resilience Through Resolvability—Moving from Policy Design to Implementation: 5th Report to the G20 on Progress in Resolution*, at 8 (Aug. 18, 2016), http://www.fsb.org/wp-content/uploads/Resilience-through-resolvability-%E2%80%93-moving-from-policy-design-to-implementation.pdf.

88 *Senior Moment: Is Europe's Framework for Resolving Banks Broken?*, Economist (June 29, 2017), https://www.economist.com/leaders/2017/06/29/is-europes-framework-for-resolving-banks-broken.

89 *Id.*

90 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.

91 *See, e.g.*, Neel Kashkari, *New Bailouts Prove 'Too Big to Fail' Is Alive and Well*, Wall St. J. (July 9, 2017), https://www.wsj.com/articles/new-bailouts-prove-too-big-to-fail-is-alive-and-well-1499638636 (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 Anat Admati likewise argues:

> 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 or 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., Feb. 2016, at R4, R10.

92 *See* Emilios Avgouleas et al., *Living Wills as a Catalyst for Action* 4 (Duisenberg Sch. of Fin., Policy Paper No. 4, 2010.)

93 Eric S. Halperin, *CoCo Rising: Can the Emergence of Novel Hybrid Securities Protect From Future Liquidity Crises?*, 8 Int'l L. & Mgmt. Rev. 15, 21–23 (2011) (explaining why issuing CoCos to investors may be more expensive than issuing ordinary debt); Paul Melaschenko

questions whether CoCos "with all the uncertainties surrounding their actual operation in times of stress . . . are actually a source of fragility."[94]

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 that bank assets can suffer large, sudden losses.[95] 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."[96] Yet the failure to reduce this moral hazard is likely to further increase the cost of issuing CoCos.[97]

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 preplans wiping out the equity owners of a systemically important firm that starts to become troubled, making either the government or the firm's creditors the new equity owners. This approach is similar to a "bail-in."[98]

As a macroprudential tool, this approach is increasingly exemplified by the single point of entry (SPOE) strategy.[99] This strategy is artificially depen-

& Noel Reynolds, *A Template for Recapitalising Too-Big-to-Fail Banks*, BANK FOR INT'L SETTLEMENTS Q. REV., June 2013, at 25, 34.

94 Gera Kiewiet et al., *Contingent Convertibles: Can the Market Handle Them?* 29–30 (De Nederlandsche Bank, Working Paper No. 572, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3048806 (finding that because investors are unable to distinguish between the riskiness of different CoCos, they are motivated to sell off their investments in all bank CoCos after a profit warning issued by just one bank).

95 George Pennacchi, *A Structural Model of Contingent Bank Capital* 30 (Fed. Res. Bank of Cleveland, Working Paper No. 10-04, 2011), https://business.illinois.edu/gpennacc/ConCap030211.pdf.

96 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.

97 *Cf.* Pennacchi, *supra* note 95, 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").

98 Although the terminology is inexact, a "bail-in" usually refers to writing off creditor claims, as opposed to equity interests. *See, e.g.*, Ben Eisen, *A New Worry for Bank Investors: Bail-In Risk*, WALL ST. J. (Feb. 17, 2016), http://www.wsj.com/articles/a-new-worry-for-bank-investors-bail-in-risk-1455705000; *What Is a Bail-In?*, ECONOMIST (Apr. 8, 2013), http://www.economist.com/blogs/economist-explains/2013/04/economist-explains-2.

99 *See, e.g.*, Daniel K. Tarullo, Member, Bd. of Governors of the Fed. Reserve Sys., Remarks at the Federal Reserve Board and Federal Reserve Bank of Richmond Conference: Toward Building a More Effective Resolution Regime: Progress and Challenges (Oct. 18, 2013), https://www.federalreserve.gov/newsevents/speech/tarullo20131018a.htm

dent on systemically important firms having a parent-subsidiary organizational structure in which a non-systemically-important parent holds the stock of the systemically important subsidiary.[100] At the start, therefore, the strategy faces implementation challenges for systemically important firms that lack that organizational structure.[101]

Under the SPOE strategy, if the subsidiary begins to fail, a government agency[102] would become the receiver of the parent,[103] wiping out the parent company's shareholders (and potentially writing down some of its debt).[104] 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 collapsed),[105] while it seeks to sell its receivership interest to equity investors to bring in more permanent capital.[106] Proponents of the SPOE strategy are optimistic it can work once the challenges are resolved.[107] 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."[108] 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 economic climate.[109] Others argue that "reputational contagion" may cause investor flight within the United States once the holding company is liquidated, regardless of how many subsidiaries are still

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

100 John Crawford, Essay, *"Single Point of Entry": The Promise and Limits of the Latest Cure for Bailouts*, 109 Nw. U. L. Rev. Online 103, 107 (2014).

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

102 In the United States, this agency would be the FDIC pursuant to the OLA. *See supra* notes 49–51 and accompanying text.

103 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 "single point of entry" (SPOE) strategy. *See, e.g.*, Jerome H. Powell, Member, Bd. of Governors of the Fed. Res. Sys., Remarks at the Institute of International Bankers 2013 Washington Conference: Ending "Too Big to Fail" (Mar. 4, 2013), http://www.federalreserve.gov/newsevents/speech/powell20130304a.htm.

104 *Id.*

105 Jin, *supra* note 51, at 1764.

106 Powell, *supra* note 103.

107 Jeremy C. Stein, *Regulating Large Financial Institutions*, *in* What Have We Learned?: Macroeconomic Policy After the Crisis 135, 136 (George Akerlof et al. eds., 2014).

108 Stephen J. Lubben & Arthur E. Wilmarth, Jr., *Too Big and Unable to Fail*, 69 Fla. L. Rev. 1205, 1207 (2017).

109 Neel Kashkari, President, Fed. Res. Bank of Minneapolis, Remarks at the Brookings Institution: Lessons from the Crisis: Ending Too Big to Fail (Feb. 16, 2016), https://www.minneapolisfed.org/news-and-events/presidents-speeches/lessons-from-the-crisis-ending-too-big-to-fail.

operating.[110] 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.[111] That operation might limit its effectiveness as a macroprudential regulatory tool.

3. Last-Resort Lending

Illiquidity is the primary factor that can cause firms to fail.[112] 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).[113] Such lending is proactive because it is preplanned to strengthen the firm's ability to pay its debts if it starts to become troubled.[114] 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.[115] This limitation appears somewhat excessive, if not dangerous.[116]

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

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110 Emilios Avgouleas & Charles A. Goodhart, *A Critical Evaluation of Bail-In as a Bank Recapitalisation Mechanism* 1, 18 (Ctr. for Econ. Policy Research, Discussion Paper No. 10065, 2014); *cf.* Paul H. Kupiec & Peter J. Wallison, *Can the "Single Point of Entry" Strategy Be Used to Recapitalize a Failing Bank?* 6–7 (Am. Enter. Inst., Economic Working Paper 2014-08, 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).

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

112 *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").

113 *See, e.g.*, FILIPPO OCCHINO, FED. RES. BANK OF CLEVELAND, Central Bank Lending in a Liquidity Crisis (2016), https://www.clevelandfed.org/newsroom-and-events/publications/economic-commentary/2016-economic-commentaries/ec-201602-central-bank-lending-in-a-liquidity-crisis.aspx. The U.S. Federal Reserve Bank, for example, has had this role of lender of last resort to banks. Federal Reserve Act, 12 U.S.C. § 343 (2012).

114 *See supra* note 77 and accompanying text (defining proactive resolution). Because of the borrowing firm's solvency, last-resort lending might also arguably be categorized as counteractive.

115 Dodd-Frank Wall Street Reform and Consumer Protection Act § 1101(b), 11 U.S.C. §507(a)(2) (2012) (limiting the Federal Reserve Bank's power under section 13(3) of the Federal Reserve Act).

116 *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 n.2 (2011).

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 involve resolution.[117] 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.[118] 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.[119] That broader focus goes beyond this Article's focus on regulation that is truly resolution-based and would unnecessarily expand the Article's scope.[120] This Article therefore limits its analysis below to reactive and proactive resolution.[121]

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.

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117 *See supra* note 37 and accompanying text.

118 *Cf.* Panel Discussion of SIFI at the International Insolvency Institute Annual Meeting in London (June 19, 2017) (discussing capital and liquidity-coverage requirements as a form of "counteractive" resolution-based regulation). The author served as a panelist for this discussion.

119 *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).

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

121 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. *See Shit Hits the Fan*, URBAN DICTIONARY (Oct. 20, 2006), 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.

II. IDENTIFYING RESOLUTION'S MACROPRUDENTIAL GOALS

Macroprudential regulation is intended to protect the stability of the financial system.[122] The macroprudential regulatory goals of resolution should therefore include achieving 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 systemically important firm individually is insufficient to protect all such firms. Resolution should therefore also be adapted, if feasible, to protect systemically important firms collectively. 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 Collectively

Intuitively, regulation that protects individual systemically important firms might appear macroprudential: after all, if no systemically important firm fails, no such firm's failure would trigger a systemic collapse. 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."[123] As next explained, however, the distributive-law analogy between mathematics and systemic risk is false.[124] Furthermore, other failures can trigger a systemic collapse.[125]

The distributive-law analogy is false for several reasons.[126] Professor Rizwaan 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.'"[127] He argues, however, that protecting individual firms can sometimes aggravate financial

122 *See supra* note 2 and accompanying text.

123 *Distributive Law*, ENCYCLOPAEDIA BRITANNIC, https://www.britannica.com/topic/distributive-law (last visited June 1, 2006). The distributive law is stated symbolically as $a(b + c) = ab + ac$. *Id.*

124 *See infra* notes 126–35 and accompanying text.

125 *See infra* Section II.B.

126 *See* Douglas J. Elliott et al., *The History of Cyclical Macroprudential Policy in the United States* 6 (Bd. of Governors of the Fed. Reserve Sys. Fin. and Econ. Discussion Series, Paper 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").

127 Rizwaan Jameel Mokal, *Liquidity, Systemic Risk, and the Bankruptcy Treatment of Financial Contracts*, 10 BROOK. J. CORP. FIN. & COM. L. 15, 21 (2015) (quoting Claudio Borio, *Rediscovering the Macroeconomic Roots of Financial Stability Policy: Journey, Challenges, and a Way Forward*, 3 ANN. REV. FIN. ECON. 87, 88 (2011)).

instability, using the example of "netting" interfirm liabilities to reduce a firm's exposure[128]:

> [N]etting 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.[129]

The distributive-law analogy is also false because individual systemically important firms are not always resolved in a way that reduces systemic risk. Corporate reorganization law, for example, normally looks to the parties in interest to reach a consensual debt restructuring plan,[130] absent which the firm could attempt to cram down a plan over those parties' objections or, in a worst case, be liquidated.[131] The parties in interest are limited primarily, however, to the firm and its investors (i.e., its creditors and shareholders).[132] As shown in a separate context, the interests of those parties are fundamentally misaligned with the public's interest to reduce systemic risk.[133]

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 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.[134] That requirement, however, has the

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128 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.

129 *Id.* at 19. In the derivatives context, I have made similar arguments about the potential for netting to increase interparty concentrations, weaken credit standards, and otherwise increase systemic risk. *See supra* notes 68–73 and accompanying text.

130 *See* 11 U.S.C. § 1109(b) (2012) (listing the parties in interest).

131 *Compare id.* § 1129(b) (discussing the cram-down requirements that a plan be fair and equitable and not discriminate unfairly), *with id.* § 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).

132 *See id.* § 1109(b).

133 Schwarcz, *supra* note 35, at 2; *see also supra* note 15 and accompanying text (referencing that misalignment).

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

potential to correlate an industry-wide dumping of bonds that lose that rating, in turn causing a systemically risky bond-market collapse.[135]

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

B. Resolution Should Also Protect Systemically Important Markets and Infrastructure

Even if systemically important firms could be protected both individually and collectively, the failure of other critical elements of the financial system could trigger a systemic collapse.[136] 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.[137] Arguably, 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, that were caused by the market collapse.[138] In 2007, when home prices began declining, subprime borrowers could not refinance and, in many cases, defaulted.[139] Even borrowers who could afford to pay their mortgage loans were "tempted to walk away as mortgage loans exceeded home values."[140] These mortgage defaults in turn caused substantial amounts of low investment-grade mortgage-backed securities (MBS) to default and some AAA-rated MBS to be downgraded.[141] The defaults were especially large for certain highly leveraged MBS securities, which were indirectly backed by subprime mortgages;[142] full payment of even the senior classes of these securities was extremely sensitive to cash-flow varia-

135 *Id.* at 1602; *see* Erik F. Gerding, *Law, Bubbles, and Financial Regulation*, *in* 18 THE ECONOMICS OF LEGAL RELATIONSHIPS 1, 13 (Nicholas Mercuro & Michael D. Kaplowitz eds., 2014) (arguing that regulations can create investment preferences for certain asset classes, setting the stage for asset bubbles and disastrous bank runs); Müelbert, *supra* note 18, at 395 (observing that financial regulation that "causes banks to act in a (more) uniform way . . . will increase systemic risk").

136 *Cf.* Anabtawi & Schwarcz, *supra* note 5, 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 11 (Diana Wright ed., 2008). The financial system therefore clearly qualifies as a "system."

137 *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).

138 This financial crisis discussion is adapted from Steven L. Schwarcz, Keynote Address, *Understanding the Subprime Financial Crisis*, 60 S.C. L. REV. 549 (2009).

139 *Id.* at 551.

140 *Id.* at 552.

141 *Id.*

142 *Id.* These were called "ABS CDO" securities. *Id.*

tions and dependent on the (failed) assumption that housing prices would continue to appreciate.[143] These defaults and downgrades of rated securities, in turn, unnerved investors who believed that AAA meant ironclad safety and that investment grade meant relative freedom from default.[144]

"Investors started losing confidence in ratings and avoiding debt securities."[145] 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.[146] The market prices of MBS, for example, "collapsed substantially below the intrinsic value of the mortgage assets underlying those securities."[147] This collapse in market prices required banks and other financial institutions holding MBS (and other asset-backed securities) "to write down the securities' value."[148] That in turn made institutions with significant holdings of these securities, such as Lehman Brothers, appear (if not be) financially riskier, raising concern over counterparty risk.[149] "[A]fraid these institutions might default on their contractual obligations, many parties stopped dealing with them."[150] The refusal of the U.S. government to save Lehman Brothers in mid-September 2008, and its resulting bankruptcy, added to the panic.[151] Debt markets became so spooked that even the short-term commercial paper markets virtually shut down.[152] Without debt-market financing, which constitutes approximately fifty-eight percent of all corporate credit availability,[153] companies lacked money to expand and sometimes even to pay current expenses.[154] The economy collapsed.

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143 *Id.* at 550.

144 *Id.* at 552.

145 *Id.*

146 *Id.* "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." *Id.* (footnote omitted).

147 *Id.* at 552–53.

148 *Id.* at 553.

149 "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*, 46 U. MICH. J.L. REFORM 69, 74 (2012).

150 Schwarcz, *supra* note 138, at 553.

151 *Id.* at 552.

152 *Id.*

153 SILVIO CONTESSI ET AL., FED. RES. BANK OF ST. LOUIS, BANK VS. BOND FINANCING OVER THE BUSINESS CYCLE 1 (2013), https://research.stlouisfed.org/publications/es/13/ES_31_2013-11-15.pdf. By comparison, bank loans make up only about ten percent of corporate credit availability. *Id.* These estimates are based on 2003–2013 data. *Id.*

154 *See, e.g.*, Fiorella De Fiore & Harald Uhlig, Corporate Debt Structure and the Financial Crisis 2 (2012) (unpublished manuscript), https://economicdynamics.org/meetpapers/2012/paper_429.pdf ("[T]he 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,[155] which (among other functions) provides the clearing[156] and settlement[157] services needed to consummate the transfer of securities and other financial assets and the payment therefor.[158] The clearinghouses and other firms currently providing the bulk of these services are sometimes called financial market utilities ("FMUs").[159] For example, The Depository Trust Company (DTC) is an FMU that clears and settles the transfer of securities[160] and the Chicago Mercantile Exchange is an FMU that clears and settles transactions involving "exchange-traded contracts" and over-the-counter (OTC) derivatives.[161] Some FMUs, known as

155 BANK FOR INT'L SETTLEMENTS & INT'L ORG. OF SEC. COMM'NS, PRINCIPLES FOR FINANCIAL MARKET INFRASTRUCTURES 14 (2012) (observing that "the disorderly failure of [a financial market infrastructure] would likely lead to systemic disruptions"); *cf.* Darrell Duffie, *Resolution of Failing Central Counterparties*, *in* MAKING FAILURE FEASIBLE 87, 88 (Kenneth E. Scott et al. eds., 2015) (discussing the consequences of "loss of continuity of critical clearing services on which the financial system has come to depend").

156 Clearing is "the process of transmitting, reconciling and, in some cases, confirming transfer orders prior to settlement." EUROPEAN CENT. BANK, GLOSSARY OF TERMS RELATED TO PAYMENT, CLEARING AND SETTLEMENT SYSTEMS 5 (2009), https://www.ecb.europa.eu/pub/pdf/other/glossaryrelatedtopaymentclearingandsettlementsystemsen.pdf.

157 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.*

158 For a broader discussion of the financial infrastructure, see *Designated Financial Market Utilities*, BD. GOVERNORS FED. RES. SYS., https://www.federalreserve.gov/paymentsystems/designated_fmu_about.htm (last updated Jan. 29, 2015).

159 *Cf. id.* (referring to financial market utilities (FMU) 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., *Financial Market Utilities and the Challenge of Just-in-Time Liquidity* (Fed. Res. Bank of Chicago, Chicago Fed. Letter No. 268a, 2009), https://www.chicagofed.org/publications/chicago-fed-letter/2009/november-268a. The Financial Stability Oversight Council 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), https://www.treasury.gov/initiatives/fsoc/Documents/2012%20Annual%20Report.pdf. At least eight of the largest FMUs, known as Systemically Important FMUs ("SIFMUs"), have been so designated. Dan Ryan, *Financial Market Utilities: Is the System Safer?*, HARV. L. SCH. F. ON CORP. GOV. & FIN. REG. (Feb. 21, 2015), https://corpgov.law.harvard.edu/2015/02/21/financial-market-utilities-is-the-system-safer/.

160 Steven L. Schwarcz, *Intermediary Risk in a Global Economy*, 50 DUKE L.J. 1541, 1550 (2001).

161 *See* CHI. MERCANTILE EXCH. GRP., CME GROUP OVERVIEW (2013), http://www.cmegroup.com/company/visit/files/cme-group-overview.pdf (describing the Exchange's activities); *Designated Financial Market Utilities*, *supra* note 158 (confirming that the Exchange is an FMU).

central counterparties ("CCPs"),[162] also help to reduce counterparty risk that can result from those procedural steps.[163]

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.[164] Although the clearing and settlement services performed by the first FMU are unlikely to cause it to fail,[165] some FMUs are part of a holding company structure that exposes them to other risks.[166] If, say, an FMU's corporate parent files for bankruptcy, the FMU could easily become part of the bankruptcy estate.[167] Any resulting suspension of clearing and settlement, even if temporary, could disrupt the transfer of securities and cause a financial panic.[168]

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.[169] Thus, if the settlement requires counterparty *A* to pay counterparty *B*, the CCP will make that payment to counterparty *B* and then seek reimbursement from counterparty *A*.[170] Although this reduces individual counterparty risk, it concentrates aggregate counterparty risk in the CCP.[171] If the CCP is unable to obtain sufficient aggregate reimburse-

162 *See* Baker, *supra* note 149, at 74.

163 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.*

164 In the United States, all standardized derivatives transactions must be settled through such central counterparties ("CCPs"). Dodd-Frank Wall Street Reform and Consumer Protection Act § 725(c), 7 U.S.C. § 7a-1 (2012).

165 This assumes the FMU provides those services without negligence.

166 *See infra* notes 264–75 and accompanying text.

167 This could occur in various ways in the United States, including the parent causing its FMU subsidiary to file for bankruptcy, 11 U.S.C. § 301 (2012), or the FMU being substantively consolidated with the parent. *Id.* § 105.

168 *Cf.* Hester Peirce, *Derivatives Clearinghouses: Clearing the Way to Failure*, 64 CLEV. ST. L. REV. 589, 627 (2016) (observing that 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"). The question of whether the FMU's bankruptcy would suspend clearing or settlement would be an issue of first impression. 11 U.S.C. § 362(a) (imposing a stay automatically suspending various interactions between a debtor and third parties).

169 Heckinger et al., *supra* note 159 (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 159, at 174 (discussing ICE Clear Credit, a CCP that clears credit-default swap (CDS) derivatives, thereby "lower[ing] the likelihood of a default leading to a financial contagion of defaults across major CDS counterparties").

170 *Cf.* Mark J. Roe, *Clearinghouse Overconfidence*, 101 CALIF. L. REV. 1641, 1661 (2013) (providing an example of the above scenario, where a CCP pays counterparty *B*).

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

ment, it may itself default.[172] That in turn could suspend all or a portion of the market for derivatives transactions, causing systemic contagion including "fire sales of collateral or derivatives contracts, exacerbating broad market volatility."[173]

For these reasons, the macroprudential goals of resolution-based regulation should include protecting not only systemically important firms (both individually and collectively) 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 collectively,[174] considering both reactive and proactive resolution.[175] Thereafter, it examines how resolution-based regulation could protect systemically important markets and infrastructure,[176] again considering both reactive and proactive resolution. The Appendix to this Article briefly summarizes the resulting design recommendations, referencing them back to this Part's detailed discussion.

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 collectively. Consider how that could be done.

1. Reactive Resolution

Reactive resolution-based regulation is inherently limited in its ability to protect systemically important firms collectively; 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

172 *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." *Id.*; *see also* Ryan, *supra* note 159 (observing that some of these risk-management strategies are required by law).

173 Duffie, *supra* note 155, at 88 (arguing that a CCP's "fail[ure] to meet its obligations to other systemically [important] clearing members" could cause that contagion).

174 *See infra* Section III.A.

175 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 120 and accompanying text.

176 *See infra* Sections III.B–C.

way.[177] The author is part of a group of bankruptcy and financial regulation scholars that has been considering this problem, among others.[178]

There are at least two 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."[179] In the United States, "[b]ankruptcy judges cannot provide that coordinated response."[180] Regulatory-supervised resolution, however, could provide a more coordinated response—especially internationally.[181] Regulatory reassurance might also help to reduce the risk of a financial panic.[182]

This Article has already discussed regulatory-supervised reactive resolution by the FDIC, pursuant to its receivership powers under the OLA.[183] As an administrative agency, the FDIC certainly has more discretion and flexibility than individual bankruptcy judges to coordinate the resolution of multiple troubled firms.[184] 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,[185] 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. Although such a procedure might raise its own limitation—that supervising regulatory officials will likely have

177 *See supra* note 48 and accompanying text.

178 *Cf.* Financial Scholars Letter, *supra* note 50, 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. *Id.* at 2; *cf. supra* note 62 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).

179 Financial Scholars Letter, *supra* note 50, at 4.

180 *Id.* at 4–5 (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").

181 *Id.* at 5.

182 *Id.*; *cf.* 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 436–37 (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).

183 *See supra* notes 49–59 and accompanying text (discussing those receivership powers).

184 *Cf. supra* note 56 (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).

185 *See supra* notes 55–57 and accompanying text.

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.

The other constraint is the difficulty of raising sufficient financing—typically referred to as "debtor in possession" (DIP) financing—to enable multiple troubled systemically important firms to continue operating for the length of time needed to reorganize their capital structure.[186] Absent DIP financing, a firm may have little choice but to liquidate.[187] The "private sources" that ordinarily provide DIP financing in traditional bankruptcy cases "would be either unavailable or at least inadequate" to resolve large systemically important firms.[188] 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 the DIP financing. The U.S. and Canadian governments provided DIP financing, for example, in the General Motors bankruptcy.[189] 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.[190] The ability and willingness of governments to extend DIP financing more broadly are beyond this Article's scope.[191]

2. Proactive Resolution

This Article has shown that existing and contemplated proactive resolution-based regulation may also be insufficient as a macroprudential tool.[192]

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186 Gilson, *supra* note 40, at 28.

187 *Id.* at 23–28 (explaining that DIP financing provides a solution to the problem of "debt overhang," which can leave a firm with "no choice but to liquidate their assets").

188 Howell E. Jackson & Stephanie Massman, *The Resolution of Distressed Financial Conglomerates*, 3 RUSSELL SAGE FOUND. J. SOC. SCI. 48, 60–61, (2017), https://www.rsfjournal.org/doi/pdf/10.7758/RSF.2017.3.1.03.

189 Christine Caulfield, *GM Gets OK to Tap $33.3B In DIP Financing*, LAW 360 (June 25, 2009), https://www.law360.com/articles/108332/gm-gets-ok-to-tap-33-3b-in-dip-financing.

190 Jackson & Massman, *supra* note 188, at 67 (quoting 12 U.S.C. § 1823(c)(4)(G) (2012)).

191 In the United States, the Federal Reserve might also have authority to "engage in lender-of-last resort functions for appropriately collateralized credit under a 'program or facility with broad-based eligibility.'" *Id.* at 67 (quoting Federal Reserve Act § 13(3), 12 U.S.C. § 343 (2012)).

192 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 supra* subsection I.B.1. 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

To try to design more effective proactive resolution-based regulation, consider insights into protecting financial stability from viewing the financial system as a "system."[193]

Systems in general—and the financial system in particular—that are both interactively complex[194] and tightly coupled[195] are "prone to catastrophic failures" because that combination "obfuscate[s] risk and present[s] little opportunity for intervention following a local shock."[196] In contrast, systems that are not both interactively complex and tightly coupled are less systemically risky.[197] This suggests that proactive resolution-based regulation should be designed to reduce tight coupling and/or interactive complexity among systemically important firms.

Consider how proactive resolution-based regulation could be designed to reduce interactive complexity.[198] 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.[199] As a form of risk aversion, they therefore assume that distressed securities owned by a given firm are also held by similarly situated firms.[200] If any of

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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 secondarily to protect financial stability. *See supra* subsection I.B.2. 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 supra* subsection I.B.3.

193 *Cf. supra* note 136 (showing that the financial system "clearly qualifies as a 'system'").

194 "An interactively complex system is one whose components can interact in unexpected or varied ways . . . ." RICHARD BOOKSTABER, A DEMON OF OUR OWN DESIGN: MARKET, HEDGE FUNDS, AND THE PERILS OF FINANCIAL INNOVATION 154 (2007). As a result, a shock to one component can lead to "failures that seem to come out of nowhere or that appear unfathomably improbable." *Id.* at 55.

195 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 5, at 94.

196 *Id.* at 112.

197 *Id.* 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. (footnote omitted).

198 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.

199 Anabtawi & Schwarcz, *supra* note 5, at 94.

200 *Id.* at 95.

those firms fails, market participants may become reluctant to extend credit to similar firms—even those that, in fact, are financially healthy.[201] The loss of credit can then trigger unpredictable failures of healthy firms, hastening a financial crisis.[202] 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.[203]

The other source of interactive complexity is that market participants do not know the contractual obligations of other firms.[204] Yet if a firm defaults on its obligations, its counterparties may be forced to default on their own obligations.[205] 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.[206] The risk aversion might be especially high if market participants fear a firm is contingently obligated on derivatives contracts that expose it to indeterminate liability.[207] Proactive resolution-based regulation[208] could help to reduce this source of interactive complexity by requiring systemically important firms, as before,[209] to disclose the amount—or in the case of feared indeterminate liability, the estimated limit[210]—and nature of their contractual obligations.[211]

Proactive resolution-based regulation could also help to reduce tight coupling.[212] 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

201 *Id.* at 95–96.

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

203 I categorize this form of resolution-based regulation as proactive because it provides for a preplanned enhancement (enhanced disclosure) that takes effect if the firm starts to become 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 supra* text accompanying notes 77–78 (defining proactive resolution-based regulation). Requiring disclosure might also be seen as counteractive.

204 Anabtawi & Schwarcz, *supra* note 5, at 114.

205 *Id.* at 88.

206 *See id.* at 95–96.

207 Schwarcz, *supra* note 77, at 243–45.

208 This form of resolution-based regulation is proactive. *See supra* note 203 and accompanying text.

209 *See supra* notes 202–04 and accompanying text.

210 Parties to derivatives contracts usually can estimate the limits of their potential liability. Steven L. Schwarcz, *Central Clearing of Financial Contracts: Theory and Regulatory Implications,* 167 U. PA. L. REV. (forthcoming 2018–19), https://ssrn.com/abstract=3104079.

211 *Cf.* Schwarcz, *supra* note 77, at 243–47, 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. *Id.* at 243. GAAP requires parties to disclose contingent liabilities only if the contingency is a "reasonable possibility," which itself is a subjective determination. *Id.* at 243–44 nn.181–83.

212 *Id.* at 247.

illiquid systemically important firm—from spreading rapidly to other parts of the system, including the defaulting firm's counterparties.[213] 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.[214] 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 rescinded.[215]

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.[216]

B. Resolution-Based Regulation of Systemically Important Markets

1. Reactive Resolution

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.

2. Proactive Resolution

In contrast, proactive resolution-based regulation is ideally suited for resolving systemically important markets that start to become troubled. Conceptually, there are at least two possible approaches: to preplan enhancements that can make such a market become more internally robust,[217] and to commit parties in advance to provide liquidity to support such a market.[218]

Preplanning can make an unstable market more internally robust by reducing its tight coupling.[219] 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.[220] Also, "mark-to-market" accounting, which requires that a securities account be adjusted in response to a change in the market value of the

213 *See* Steven L. Schwarcz, Essay, *Controlling Financial Chaos: The Power and Limits of Law*, 2012 WIS. L. REV. 815, 829.

214 *See* Schwarcz, *supra* note 77, at 250.

215 *See* Schwarcz, *supra* note 213, at 829–33.

216 *See generally* Peirce, *supra* note 12.

217 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").

218 *Id.*

219 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 195.

220 *See, e.g.*, Anabtawi & Schwarcz, *supra* note 5, at 118 (explaining that "algorithmically driven selling" of securities was a cause of the flash crash in 2010).

securities (ordinarily reducing risk),[221] can inadvertently cause fire sales[222] that "distort value" during times of extreme market volatility.[223]

Regulatory preplanning can reduce the tight coupling of systemically important financial markets. 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 preset amount in less than a preset time span.[224] Regulatory preplanning can also reduce the tight coupling of mark-to-market accounting by suspending that accounting requirement in times of extreme market volatility.[225]

That preplanning would require regulators to decide in advance—in many cases, on a market-by-market basis—what price declines would be too rapid,[226] thereby justifying the suspension of trading, and what would constitute extreme market volatility,[227] 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

221 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 ET AL., 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 Relation 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).

222 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 5, at 118–19.

223 *Id.* at 119.

224 *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. *Investor Bulletin: Measures to Address Market Volatility*, U.S. SEC. EXCHANGE & COMM'N. (July 1, 2012), https://www.sec.gov/oiea/investor-alerts-bulletins/investor-alerts-circuitbreakersbulletinhtm.html (informing investors of possible circuit breakers for markets for equity securities).

225 Anabtawi & Schwarcz, *supra* note 5, at 119.

226 *See supra* note 224 and accompanying text.

227 *See supra* note 225 and accompanying text.

which regulators should make those decisions is beyond this Article's scope.[228]

Proactive resolution-based regulation can also strengthen and facilitate the resolvability of unstable financial markets 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,[229] impose liquidity requirements on their members.[230] 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 values but above their then-current prices"[231] in order to "stabiliz[e] the prices of distressed financial assets."[232]

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,[233] any reactive resolution would need to occur immediately to prevent troubled infrastructure from failing. Negotiated resolution, as occurs in a bankruptcy case,[234] would therefore likely be much too slow. More quickly acting regulatory interventions, 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.[235] Among other limitations, the FDIC, which administers the OLA, "does not have experience regulating clearinghouses or the derivatives markets."[236] Also, it is unclear whether the FDIC could find a large healthy clearinghouse to acquire a troubled clearinghouse. The

228 The SEC's initial circuit-breaker designs "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), https://sixfigureinvesting.com/2015/08/secs-circuit-breakers-for-etf-etn-flash-crash/.

229 *See* N.Y. Stock Exch., Designated Market Makers (2016), https://www.nyse.com/publicdocs/nyse/markets/nyse/designated_market_makers.pdf.

230 Schwarcz, *supra* note 217, at 45.

231 Anabtawi & Schwarcz, *supra* note 5, at 108–09.

232 *Id.* at 107; *cf.* Gordon & Muller, *supra* note 116, at 185 (making similar arguments).

233 *See supra* notes 154–57 and accompanying text.

234 *See supra* note 48 and accompanying text.

235 *See supra* note 159 and accompanying text.

236 David Skeel, *What if a Clearinghouse Fails?*, Brookings Institution (June 6, 2017), https://www.brookings.edu/research/what-if-a-clearinghouse-fails/. One scholar argues that the prominent role of the FDIC and the absence of the Commodity Futures Trading Commission 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).

limitations may be even worse for clearinghouses that constitute CCPs,[237] 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."[238]

Professor Stephen Lubben has proposed an expedited regulatory intervention to nationalize clearinghouses on the brink of failure, wiping out "equity, memberships, and investor debt."[239] Previous clearinghouse members could continue clearing through the nationalized clearinghouse on a "fee for services basis."[240] 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."[241] Nationalization, however, seems to be an overly draconian remedy that might even be unconstitutional.[242]

2. Proactive Resolution

Proactive resolution, in contrast, should be especially appropriate for infrastructure to ensure the uninterrupted and ongoing operation of the financial system.[243] Just as preplanned liquidity can enable systemically important firms that start to become troubled to pay their debts[244] and can stabilize prices in turbulent financial markets,[245] it can also be used to stabilize troubled infrastructure—such as by enabling a financially unstable 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."[246]

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237 *Cf. supra* notes 162–64 and accompanying text (defining CCPs).

238 Duffie, *supra* note 155, at 88.

239 Stephen J. Lubben, *Nationalize the Clearinghouses!* 30, 31 (Seton Hall Pub. Law Research Paper No. 2458506, 2014), http://ssrn.com/abstract=2458506 (arguing that a federally chartered bridge institution should take over the troubled clearinghouse).

240 *Id.* at 31.

241 *Id.*

242 *Cf.* Duffie, *supra* note 155, at 104 ("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 in a liquidation scenario, in order to reduce total social losses, would in this sense involve some sort of violation of property rights."). This Article does not analyze whether that nationalization might violate the Fifth Amendment.

243 *See supra* text accompanying note 233; *cf.* Peirce, *supra* note 168, at 647 (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).

244 *See supra* notes 112–14 and accompanying text.

245 *See supra* text accompanying notes 229–32.

246 *See* 12 U.S.C. § 5465(b) (2012) ("The Board of Governors may authorize a Federal Reserve bank . . . to provide to a designated financial market utility discount and borrowing privileges only in unusual or exigent circumstances . . . ."); Peirce, *supra* note 168, at 648.

FMUs that have been designated as systemically important FMUs[247] are already subject to proactive resolution-based regulation requiring them to prepare both a recovery plan and a wind-down plan.[248] International regulators likewise want systemically important FMUs to plan how to try to recover, if they start to become troubled, and how to wind down if they fail to recover.[249] These wind-down plans, and possibly 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.[250]

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 Association[251] has proposed a contractual solution that it calls variation margin gains haircutting (VMGH)[252] to prevent a CCP from defaulting after its other financial resources have been exhausted.[253] At that time, the contract with its members would allow the CCP to "conserve or accumulate cash by cancelling or reducing the variation margin payments that it would otherwise have been required to make to clearing members"[254] while collecting all of the margin payments that its members owe the CCP.[255] 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, it could cause some of those firms to fail.[256] 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."[257]

247 *See supra* note 159 (discussing SIFMU designation).

248 Ryan, *supra* note 159.

249 *Id.* (discussing the Principles for Financial Market Infrastructures jointly issued in 2012 by the Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions).

250 *See supra* notes 61–64 and accompanying text.

251 *Cf. supra* note 66 (discussing ISDA).

252 *See* INT'L SWAPS & DERIVATIVES ASS'N, INC., CCP LOSS ALLOCATION AT THE END OF THE WATERFALL 4 (2013), https://www2.isda.org/attachment/NTc5Nw==/CCP_loss_allocation_waterfall_0807.pdf.

253 *Id.* at 9.

254 Duffie, *supra* note 155, at 92.

255 *See id.* 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 168, at 607.

256 Lubben, *supra* note 236, at 153.

257 OFFICE OF REGULATORY AFFAIRS., JP MORGAN CHASE & CO., WHAT IS THE RESOLUTION PLAN FOR CCPS? 2 (2014), https://www.jpmorganchase.com/corporate/About-JPMC/document/resolution-plan-ccps.pdf.

As an alternative to VMGH, investment bank JP Morgan Chase has proposed a form of privatized insurance that would be payable to help recapitalize an unstable CCP.[258] Institutional investors could earn rents (in the form of insurance premiums) by providing such insurance.[259] This would also incentivize the institutions providing the insurance to take on an outside monitoring role.[260]

The European Union is implementing a very different proactive resolution-based regulatory approach to protecting CCP infrastructure. Its European Market Infrastructure Regulation (EMIR) requires "at least two CCPs clearing a particular asset class for the clearing obligation to be imposed."[261] Therefore, if one CCP fails, another CCP should be available to perform the clearing function. EMIR is imperfect for several reasons, however. It does not solve the problem of correlated CCP failures. It ignores the possibility that a CCP's failure might itself cause trading to freeze.[262] Furthermore, it 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.[263]

The above approaches address CCPs and some of the largest FMUs,[264] but they largely neglect other FMUs that are part of a holding company structure that exposes them to affiliate financial and operating risks.[265] 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]; . . . help[s] ensure that a firm is able to operate on a standalone basis even if its affiliated firms fail; . . . [and] protect[s] a firm from being taken advantage of by affiliated firms, thereby preserving the firm's business and assets.[266]

Because it is costly, ring-fencing is most commonly used to protect monopoly or semimonopoly entities (which thus have few, if any, substitutes) that provide essential public services, such as public utilities that produce and dissem-

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258 *See id.* at 4.

259 Duffie, *supra* note 155, at 99.

260 Peirce, *supra* note 168, at 655. That alternative is similar to the partly privatized liquidity facilities discussed above. *See supra* notes 231–32 and accompanying text.

261 WORLD FED'N EXCHS., THE INTERPLAY BETWEEN CENTRAL COUNTERPARTY (CCP) RECOVERY AND RESOLUTION: A GLOBAL PERSPECTIVE 5 (2017).

262 *Cf. id.* at 7 ("Given the significant effect of [a CCP failure], 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 . . . .").

263 *See* EUROPEAN BANKING FED'N, EBF RESPONSE TO ESMA CONSULTATION PAPER ON THE CLEARING OBLIGATION UNDER EMIR (NO. 1) (2014), http://www.ebf-fbe.eu/wp-content/uploads/2014/08/EBF_009858G-FINAL-EBF-response-to-ESMA-CP-on-clearing-obligation-no.1-IRS.pdf.

264 *Cf. supra* note 159 (discussing SIFMUs).

265 *See supra* notes 165–67 and accompanying text (discussing FMU exposure to affiliate risks).

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

inate electric energy.[267] This is especially valuable where the utility is part of a holding company structure that exposes it to nonutility risk; insulation of the utility from that risk helps to assure unimpaired continuation of the public services.[268]

FMUs fit that pattern if they are in a holding company structure that exposes them to other risks. 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.[269]

For example, ICE Clear Credit, an FMU that provides central counterparty clearing services for credit-default swap derivatives, is an indirect subsidiary of Intercontinental Exchange.[270] Intercontinental Exchange engages in an aggressive acquisition strategy[271] that has caused it to incur significant debt,[272] and "[m]any aspects of [its] business . . . involve substantial risks of liability."[273] Ring-fencing ICE Clear Credit would help to protect it from its parent company's financial and operating risks,[274] thereby assuring the continuing performance of the FMU's clearing services even if the parent fails.[275]

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267 *Id.* at 105.

268 *Id.* at 74.

269 *See, e.g.*, FIN. STABILITY OVERSIGHT COUNCIL, *supra* note 159, at 157, 160–61, 174.

270 *Id.* at 172.

271 *See* INTERCONTINENTAL EXCH., ILLUMINATING MARKETS: 2016 ANNUAL REPORT 29 (2016), http://ir.theice.com/~/media/Files/I/Ice-IR/annual-reports/2016/2016-annual-report.pdf ("We may be very acquisitive.").

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

273 *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 . . . .").

274 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 preplanning protections that make the FMU bankruptcy remote from its affiliates and able to operate on a standalone basis if the affiliates fail. *Cf.* Schwarcz, *supra* note 266, at 74 (explaining how ring-fencing can help to protect the continuing functioning of a utility within a holding company structure).

275 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 159, 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.

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 variations on traditional bankruptcy; proactive resolution-based regulation, which consists of preplanned enhancements that are designed to strengthen or facilitate the resolvability of financial-system elements that start to become troubled; and counteractive regulation, which seeks to reduce the need for resolution (and thus is not truly resolution).[276]

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 collectively, 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."[277]

This Article's analysis of macroprudential resolution-based regulation should be applicable both domestically and abroad. The Article does not examine, however, the cross-border recognition or possible international integration of inconsistent resolution-based regulatory approaches. The Lehman Brothers bankruptcy illustrated that the efficient cross-border resolution of a multinational systemically important firm requires significant international coordination, making that an important subject for further study.[278]

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276 *Cf. supra* note 121 (discussing an intuitive way to distinguish these regulatory approaches).

277 *Cf. supra* note 4 (discussing the so-called macroprudential regulatory toolkit).

278 The author has separately examined cross-border recognition of resolution approaches. *See* Steven L. Schwarcz et al., *Comments on the September 29, 2014 FSB Consultative Document, "Cross-Border Recognition of Resolution Action"* (Ctr. for Int'l Governance Innovation, CIGI Paper No. 51, 2014), 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 50, 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

A. Regulatory Design Recommendations

Referencing the Article's detailed discussion, this Appendix briefly summarizes how to design "macroprudential" resolution-based regulation to protect not only systemically important firms but also systemically important financial markets and infrastructure. The summary also distinguishes which forms of resolution-based regulation are reactive[279] and which are proactive.[280]

1. Resolution-Based Regulation of Systemically Important Firms

Reactive 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,[281] requiring a more aggregate and coordinated response than is feasible in judicial bankruptcy cases.[282] 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.[283]

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 should consider providing this financing.[284]

Proactive resolution-based regulation could help to reduce the interactive complexity and tight coupling that can cause unpredictable counterparty behavior. To that end, regulation could require systemically important firms to disclose to their counterparties—at least periodically, if not also on demand—the amount and identity of their securities holdings[285] as well as the amount (or in the case of feared indeterminate liability on derivatives contracts, the estimated limit) and nature of their contractual obligations.[286] To prevent systemically important firms from defaulting and rapidly spreading financial panic, central banks could consider providing, and at least should be authorized to provide, last-resort lending to such firms—especially

279 Resolution-based regulation is reactive if it applies to financial system elements—i.e., firms, markets, or infrastructure—that become troubled.

280 Resolution-based regulation is proactive if it consists of preplanned enhancements that are designed to strengthen or facilitate the resolvability of financial system elements that start to become troubled.

281 *See supra* notes 63–64 and accompanying text.

282 *See supra* text accompanying notes 179–80.

283 *See supra* text accompanying notes 181–82.

284 *See supra* text accompanying notes 186–91.

285 *See supra* text accompanying notes 202–03.

286 *See supra* text accompanying notes 204–11.

to those that are illiquid but solvent, and thus ultimately able to repay the loan.[287]

2. 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 that trade securities and other financial assets.

Proactive resolution-based regulation is ideally suited for resolving systemically important markets that start to become troubled. To prevent the collapse of unstable markets, such regulation could require circuit breakers to automatically suspend trading if prices decline too rapidly.[288] Similarly, regulation could suspend mark-to-market accounting in systemically important markets that become subject to extreme volatility.[289]

Proactive resolution-based regulation could also require the creation of liquidity facilities to help stabilize prices in a market panic. Such facilities could be used, for example, to purchase "securities at prices that are below their intrinsic values but above their then-current prices," thereby stabilizing prices at more reasonable levels.[290] Although these liquidity facilities could be governmental, they might be partly privatized.[291]

3. Resolution-Based Regulation of Systemically Important Financial Infrastructure

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 proactive 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 proactively by ring-fencing the infrastructure and making it bankruptcy remote.[292]

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287 *See supra* text accompanying notes 213–14.

288 *See supra* text accompanying notes 224–25.

289 *See supra* text accompanying notes 224–25.

290 Anabtawi & Schwarcz, *supra* note 5, at 109; *see supra* text accompanying notes 229–32.

291 *See supra* text accompanying notes 229–32.

292 *See supra* text accompanying notes 264–75.