

# *Systemic Risk and the Financial Crisis: Protecting the Financial System as a ‘System’<sup>1</sup>*

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## **I. INTRODUCTION**

How should the law help to control systemic risk—the risk that the failure of financial markets or firms harms the real economy by increasing the cost of capital or

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decreasing its availability.<sup>3</sup> Many regulatory responses to systemic risk, like the Dodd-Frank Act in the United States, consist largely of politically motivated reactions to the global financial crisis,<sup>4</sup> often looking for wrongdoers (whether or not they exist).<sup>5</sup> But those responses are misguided if they don't address the reality of systemic risk.

Systemic risk is a form of financial risk. The primary goal for regulating financial risk is microprudential—maximizing economic efficiency by correcting market failures within the financial system—and indeed certain of those market failures can be factors in triggering systemic risk. Systemic risk regulation should therefore try to correct those market failures. But systemic risk more directly represents risk to the financial system itself. Any framework for regulating systemic risk should also include the larger “macroprudential” goal of protecting the financial system as a “system.”

To establish that framework, Part II below first considers microprudential regulation. Subpart A of that Part argues that at least four types of partly interrelated market failures occur within the financial system, and that even exemplary microprudential regulation is unlikely to completely prevent those market failures. Subpart B then explains why those intra-financial-system failures could have systemic consequences and why even the best microprudential regulation will be imperfect. Thereafter, Part III adds to the regulatory framework by examining ways in which macroprudential regulation could more directly protect the financial system, qua system. To that end, subpart A of Part III analyzes how regulation could attempt to limit the triggers of systemic risk. Finally, subpart B of Part III analyzes how regulation could

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<sup>3</sup> Cf. Steven L. Schwarcz, *Systemic Risk*, 97 GEORGETOWN LAW JOURNAL 193, 204 (2008) (defining systemic risk).

<sup>4</sup> Another dimension of this problem is that politicians have short-term reelection goals whereas good regulatory solutions are often long-term.

<sup>5</sup> The Dodd-Frank Act delegates much of the regulatory details to administrative rulemaking, in many cases after the relevant government agencies engage in further study. Perhaps even more significantly, the Act creates a Financial Stability Oversight Council, part of whose mission is to monitor and identify potential systemic threats in order to find regulatory gaps. Dodd-Frank Act § 112. The Council is aided in this task by a newly-created, nonpartisan, Office of Financial Research. *Id.* Regulators therefore will have the ability to look beyond the Act's confines.

attempt to limit the transmission and impact of systemic shocks by ensuring liquidity to financial firms and markets, by requiring financial firms to be more robust, and by ring-fencing those firms.

## II. MICROPRUDENTIAL REGULATION

At least four types of partly interrelated market failures occur within the financial system: information failure, rationality failure, principal-agent failure, and incentive failure. Consider each in turn.

### A. Correcting Market Failures Within the Financial System

1. *Information Failure.* Complexity is the main cause of information failure.<sup>6</sup> Financial markets and products are already incredibly complex, and that complexity is certain to increase. Profit opportunities are inherent in complexity, due in part to investor demand for securities that more precisely match their risk and reward preferences. Regulatory arbitrage increases complexity as market participants take advantage of inconsistent regulatory regimes both within and across national borders. And new technologies continue to add complexity not only to financial products but also to financial markets.<sup>7</sup>

Complexity is undermining disclosure, which has been the chief regulatory response to financial information failure.<sup>8</sup> The Dodd-Frank Act puts great stock in the

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<sup>6</sup> See generally Steven L. Schwarcz, *Regulating Complexity in Financial Markets*, 87 WASHINGTON UNIVERSITY LAW REVIEW 211 (2009/2010).

<sup>7</sup> I have argued that there are two aspects to complexity: cognitive complexity, meaning that things are too complicated and non-linear to understand; and temporal complexity, meaning that systems work too quickly and interactively to control. *Regulating Complexity in Financial Markets*, *supra* note 6, at 214-15. Engineers sometimes refer to temporal complexity as tight coupling. *Id.*

<sup>8</sup> See, e.g., Cynthia A. Williams, *The Securities and Exchange Commission and Corporate Social Transparency*, 112 HARVARD LAW REVIEW 1197, 1209-35 (1999) (discussing the general purpose of disclosure in the Exchange Act and the Securities Act). Although most, if not all, of the risks on complex mortgage-backed securities were

idea of improving disclosure,<sup>9</sup> but its efficacy will be limited. Some financial structures are getting so complex that they are effectively incomprehensible.<sup>10</sup> Furthermore, it may well be rational for an investor to invest in high-yielding complex securities without fully understanding them.<sup>11</sup>

Moreover, even perfect disclosure would be insufficient to mitigate information failures that cause systemic risk. Individual market participants who fully understand the risk will be motivated to protect themselves but not necessarily the financial system as a whole. A market participant may well decide to engage in a profitable transaction even though doing so could increase systemic risk because, due at least in part to corporate limited liability, much of the harm from a possible systemic collapse would be

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disclosed prior to the global financial crisis, many institutional investors—including even the largest, most sophisticated, firms—bought these securities without fully understanding them. *See* Steven L. Schwarcz, *Disclosure's Failure in the Subprime Mortgage Crisis*, 2008 UTAH LAW REVIEW 1109, 1110 (2008). *Cf.* John D. Finnerty & Kishlaya Pathak, *A Review of Recent Derivatives Litigation*, 16 FORDHAM JOURNAL OF CORPORATE AND FINANCIAL LAW 73, 74 (2011) (observing that court records reveal investors' misunderstandings about the nature of derivative financial instruments).

<sup>9</sup> *See, e.g.*, Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203 (2010), § 1103 (requiring additional disclosure); § 942(b) (requiring issuers of asset-backed securities to disclose information on the assets backing each tranche of security); § 945 (requiring the SEC to issue rules requiring issuers of asset-backed securities to disclose the nature of the underlying assets); § 951 (requiring persons who make solicitations for the sale of all or substantially all of a corporation's assets to disclose their compensation arrangements to shareholders).

<sup>10</sup> *See, e.g.*, Lee C. Buchheit, *Did We Make Things Too Complicated?*, 27 INTERNATIONAL FINANCIAL LAW REVIEW 24, 24 (2008) (U.K.); David Barboza, *Complex El Paso Partnerships Puzzle Analysts*, N.Y. TIMES, July 23, 2002, at C1 (discussing that “one industry giant, the El Paso Corporation, is growing ever more reliant on deals [using off-balance sheet partnerships] so complex that securities experts call them incomprehensible”). It appears hyperbolic to say that structures created by humans cannot be understood by humans. The larger problem may be that relatively few people can understand the structures and that many structures may not be able to be understood by any single person.

<sup>11</sup> For example, the investor simply may not have the staffing to evaluate the securities, whereas failure to invest would appear to—and in fact could—competitively prejudice the investor vis-à-vis others who invest. *See Disclosure's Failure in the Subprime Mortgage Crisis*, *supra* note 8, at 1113-15.

externalized onto other market participants as well as onto ordinary citizens impacted by an economic collapse.<sup>12</sup>

Complexity also makes it difficult for regulators to understand, and thus effectively regulate, financial products and markets. There are at least three levels of complexity in financial markets: complexities of the assets underlying investment securities traded in financial markets and of the means of originating those assets; complexities of those investment securities themselves; and complexities of those financial markets, which operate as systems.<sup>13</sup> An understanding of these levels of complexity sometimes challenges experts at even the most sophisticated financial firms.<sup>14</sup> Regulators that lack that expertise will be even more challenged to understand these levels of complexity.

The extraordinary income gap between financial industry employees and their regulatory counterparts makes it likely that regulators will indeed lack that expertise. In the United States, for example, financial industry employees earn at least twice as much as their regulatory counterparts.<sup>15</sup> This gap enables the financial industry to bid away the smarter employees, thereby putting administrative agencies at a disadvantage.<sup>16</sup> Reducing

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<sup>12</sup> See *Systemic Risk*, *supra* note 3, at 206 (explaining this concept and describing it as a type of “tragedy of the commons”). It is a tragedy of the commons insofar as market participants suffer from the actions of other market participants; it is a more standard externality insofar as non-market participants suffer from the actions of market participants.

<sup>13</sup> *Regulating Complexity in Financial Markets*, *supra* note 6, at 216-36.

<sup>14</sup> *Cf. Disclosure’s Failure in the Subprime Mortgage Crisis*, *supra* note 8, at 1113 (arguing that although the disclosure documents describing complex asset-backed securities generally complied with federal securities law, investors did not fully understand those securities or their risks); *Regulating Complexity in Financial Markets*, *supra* note 6, at 243 (observing that even the most sophisticated investors lost money in the recent financial crisis).

<sup>15</sup> *Intrinsic Imbalance: The Impact of Income Disparity on Financial Regulation*, 78 LAW AND CONTEMPORARY PROBLEMS issue no. 1 (forthcoming symposium issue on “The Administrative Law of Financial Regulation”); available at <http://ssrn.com/abstract=2387020>.

<sup>16</sup> *Id.* (finding that the income gap between industry and regulators is much larger for financial regulation than for non-financial regulation). *Cf.* The Boston Consulting Group,

the income gap would be a politically challenging, if not impossible, task; even if government could increase the incomes of financial regulators to private-sector levels, the financial industry would be motivated to match and exceed any such increases that drew away significant talent.<sup>17</sup>

There are, therefore, no complete solutions to the problem of financial information failure.

2. *Rationality Failure.* Even in financial markets, humans have bounded rationality—a type of information failure, but one distinct and important enough to merit a separate category. In areas of complexity, for example, we tend to overrely on heuristics—broadly defined as simplifications of reality that allow us to make decisions in spite of our limited ability to process information.<sup>18</sup> Sometimes these simplifications are based on models.<sup>19</sup> Other simplifications are more psychologically based.<sup>20</sup> Reliance

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*U.S. Securities and Exchange Commission, Organizational Study and Reform* 53-54 (Mar. 10, 2011), available at 2011 WL 830339 (observing that the SEC’s senior management considers the SEC’s staff analytical capabilities to be only average or even below, and attributing that to the SEC’s relatively flat budget and its resulting hiring difficulties); Howell E. Jackson, *Variation in the Intensity of Financial Regulation: Preliminary Evidence and Potential Implications*, 24 YALE JOURNAL ON REGULATION 253, 273 (2007) (finding that the regulatory budget per staff member indicates the staff quality).

<sup>17</sup> *Intrinsic Imbalance*, *supra* note 15. This article finds that other potential responses to attempt to correct regulatory failures resulting from the income gap are even more “second best.”

<sup>18</sup> Steven L. Schwarcz, *Protecting Financial Markets: Lessons from the Subprime Mortgage Meltdown*, 93 MINNESOTA LAW REVIEW 373, 379-83 & 404-05 (2008).

<sup>19</sup> In operations research, for example, the term “heuristics” refers to “computationally simple models that allow people to ‘ . . . quickly [find] good feasible solutions.’” Konstantinos V. Katsikopoulos, *Psychological Heuristics for Making Inferences: Definition, Performance, and the Emerging Theory and Practice*, 8 DECISION ANALYSIS 10, 11 (2011) (alterations in original) (quoting FREDERICK S. HILLIER & GERALD J. LIEBERMAN, INTRODUCTION TO OPERATIONS RESEARCH 624 n.1 (7th ed. 2001)).

<sup>20</sup> In psychology, the term “heuristic” refers to both informal and quantitative psychological processes that “in general . . . are quite useful, but sometimes . . . lead to severe and systematic errors.” Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 SCIENCE 1124, 1124 (1974). For a discussion of

on a heuristic can become so routine and widespread within a community that it develops into a custom—in its common meaning of “a usage or practice common to many or to a particular place or class.”<sup>21</sup>

When a heuristic-based custom reasonably approximates reality, society should benefit. Modern finance, for example, has become so complex that the financial community routinely relies on heuristic-based customs, such as determining creditworthiness of securities by relying on formalistic credit ratings and assessing risk on financial products by relying on simplified mathematical models.<sup>22</sup> Without this reliance, financial markets could not operate.<sup>23</sup>

When a heuristic-based custom no longer reflects reality, however, reliance on the custom can become harmful. In recent years, for example, financial markets and products have innovated so rapidly that heuristic-based customs—and thus behavior based on those customs—have lagged behind the changing reality. The resulting mismatch, in turn, has led to massive financial failures, such as investors relying on credit ratings that no

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many common psychologically based simplifications and errors, see generally DANIEL KAHNEMAN, *THINKING, FAST AND SLOW* (2011).

<sup>21</sup> MERRIAM-WEBSTER’S COLLEGIATE DICTIONARY 308.

<sup>22</sup> Christopher L. Culp, Merton H. Miller & Andrea M.P. Neves, *Value at Risk: Uses and Abuses*, 10 *JOURNAL OF APPLIED CORPORATE FINANCE*, Winter 1998, at 26, 27 (1998); Steven L. Schwarcz, *Private Ordering of Public Markets: The Rating Agency Paradox*, 2002 *UNIVERSITY OF ILLINOIS LAW REVIEW* 1, 1–3.

<sup>23</sup> See James P. Crutchfield, *The Hidden Fragility of Complex Systems—Consequences of Change, Changing Consequences*, in *CULTURES OF CHANGE: SOCIAL ATOMS AND ELECTRONIC LIVES* 98, 102–03 (Gennaro Ascione et al. eds., 2009) (noting the increasing structural complexity and fragility of modern markets, including financial markets, as part of “the world we built”); see also Manuel A. Utset, *Complex Financial Institutions and Systemic Risk*, 45 *GEORGIA LAW REVIEW* 779, 799–803 (2011) (discussing the complexity of financial markets and the bounded rationality of financial-community members, as well as the need for heuristics to process and analyze financial information); Markus K. Brunnermeier & Martin Oehmke, *Complexity in Financial Markets* 5–8 (Princeton Univ., Working Paper, 2009), available at <http://scholar.princeton.edu/markus/files/complexity.pdf> (noting that because financial-community members have bounded rationality, they must simplify complex financial markets by using, for example, models and summaries).

longer are accurate and members of the financial community assessing risk using simplified models that have become misleading.<sup>24</sup>

Overreliance on heuristics merely exemplifies rationality failure, which has a wide range. Thus, market participants follow the herd in their investment choices and are also prone to panic.<sup>25</sup> Furthermore, due to availability bias, they are unrealistically optimistic when thinking about extreme events with which they have no recent experience, devaluing the likelihood and potential consequences of those events.<sup>26</sup> There are no complete solutions to the problem of rationality failure because human nature cannot be easily changed.

3. *Principal-Agent Failure.* Scholars have long studied inefficiencies resulting from conflicts of interest between managers and owners of firms.<sup>27</sup> There is, however, a much more insidious principal-agent failure: the intra-firm problem of secondary-management conflicts.<sup>28</sup> The nub of the problem is that secondary managers are almost always paid under short-term compensation schemes, misaligning their interests with the long-term interests of the firm.

Complexity exacerbates this problem by increasing information asymmetry between technically sophisticated secondary managers and the senior managers to whom they report. For example, as the VaR, or value-at-risk, model for measuring investment-

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<sup>24</sup> See Steven L. Schwarcz & Lucy Chang, *The Custom-to-Failure Cycle*, 62 DUKE LAW JOURNAL 767 (2012). Chang and I call this cycle—(i) reliance on heuristics that reasonably approximate reality; (ii) the development of customs based on those heuristics; (iii) changes that disconnect those customs from reality; and (iv) failures resulting from continued reliance on those customs—the custom-to-failure cycle.

<sup>25</sup> For a thoughtful analysis of how rationality failures help to explain the 2008 financial crisis, see Geoffrey P. Miller & Gerald Rosenfeld, *Intellectual Hazard: How Conceptual Biases in Complex Organizations Contributed to the Crisis of 2008*, 33 HARVARD JOURNAL OF LAW & PUBLIC POLICY 807 (2010).

<sup>26</sup> Iman Anabtawi & Steven L. Schwarcz, *Regulating Systemic Risk: Towards an Analytical Framework*, 86 NOTRE DAME LAW REVIEW 1349, 1366-67 (2011).

<sup>27</sup> [cite to representative examples]

<sup>28</sup> See Steven L. Schwarcz, *Conflicts and Financial Collapse: The Problem of Secondary-Management Agency Costs*, 26 YALE JOURNAL ON REGULATION 457 (2009).



portfolio risk became more accepted, financial firms began compensating secondary managers not only for generating profits but also for generating profits with low risks, as measured by VaR.<sup>29</sup> Secondary managers turned to investment products with low VaR risk profile, like credit-defaults swaps that generate small gains but only rarely have losses. They knew, but did not always explain to their superiors, that any losses that might eventually occur would be huge.

In theory, firms can solve this principal-agent failure by paying managers, including secondary managers, under longer-term compensation schemes—e.g., compensation subject to clawbacks or deferred compensation based on long-term results.<sup>30</sup> In practice, however, that solution would confront a collective action problem: firms that offer their secondary managers longer-term compensation might not be able to hire as competitively as firms that offer more immediate compensation.<sup>31</sup> Because good secondary managers can work in financial centers worldwide, international regulation may be needed to help solve this collective action problem.<sup>32</sup>

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<sup>29</sup> See, e.g., PHILIPPE JORION, *VALUE AT RISK: THE NEW BENCHMARK FOR MANAGING FINANCIAL RISK* 568 (3d ed. 2006).

<sup>30</sup> It appears that at least two financial firms, Goldman Sachs and Morgan Stanley, are beginning to implement this type of compensation policy. See Liz Moyer, *On 'Bleak' Street, Bosses in Cross Hairs*, WALL ST. J., Feb. 8, 2012 (reporting that these firms “would seek to recover pay from any employee whose actions expose the firms to substantial financial or legal repercussions”).

<sup>31</sup> See, e.g., Kimberly D. Krawiec, *The Return of the Rogue*, 51 ARIZONA LAW REVIEW 127, 157-58 (2009) (arguing that financial firms have had trouble balancing the discouragement of excessive risk-taking against the need to create profit-maximizing incentives and preferences).

<sup>32</sup> The Basel capital accords exemplify global rules intended to help avoid prejudicing the competitiveness of firms—in this case, banks—in any given nation or region. See, e.g., Clyde Stoltenberg et al., *The Past Decade of Regulatory Change in the U.S. and EU Capital Market Regimes: An Evolution from National Interests toward International Harmonization with Emerging G-20 Leadership*, 29 BERKELEY JOURNAL OF INTERNATIONAL LAW 577, 615-44 (2011) (examining U.S. and E.U. efforts to adopt harmonized financial standards); Arie C. Eernisse, *Banking on Cooperation: The Role of the G-20 in Improving the International Financial Architecture*, 22 DUKE JOURNAL OF COMPARATIVE & INTERNATIONAL LAW 239, 254-56 (2012) (discussing the Basel III capital and liquidity framework and its emphasis on consistent global standards).

4. *Incentive Failure.* Risk dispersion can create benefits, such as investment diversification and more efficient allocation of risk. But risk can be marginalized, becoming so widely dispersed that rational market participants individually lack the incentive to monitor it.<sup>33</sup> Undermonitoring caused by this incentive failure appears to have contributed, at least in part, to the global financial crisis.<sup>34</sup>

## B. The Inevitability and Consequences of Imperfectly Correcting Market Failures

Even exemplary microprudential regulation is therefore unlikely to completely prevent market failures within the financial system. That raises at least two issues: could these failures have systemic consequences, and how exemplary could microprudential regulation become?

1. *Could Market Failures Within the Financial System Have Systemic Consequences?* Certain types of these market failures, even though they occur within the financial system, could well have systemic consequences. Information failure is classically seen, for example, as the source of bank runs.<sup>35</sup> Information failure, principal-agent failure, and incentive failure could, individually or in combination, cause one or more large financial firms to overinvest, leading to bankruptcy; and the bankruptcy of a large, interconnected financial firm could lead to a systemic collapse.

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<sup>33</sup> See Steven L. Schwarcz, *Marginalizing Risk*, 89 WASHINGTON UNIVERSITY LAW REVIEW 487 (2012).

<sup>34</sup> Cf. Jean-Claude Trichet, President of the European Central Bank, Speech before the Fifth ECB Central Banking Conference (Nov. 13, 2008) (arguing that ‘the root cause of the [financial] crisis was the overall and massive undervaluation of risk across markets, financial institutions and countries’); Joe Nocera, *Risk Mismanagement*, N.Y. TIMES, Jan. 4, 2009, § 6 (Magazine).

<sup>35</sup> Cf. Douglas W. Diamond & Philip H. Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*, 91 J. POL. ECON. 401, 404 (1983) (using the Diamond-Dybvig model to explain bank runs as a form of undesirable equilibrium triggered by expectations based on incomplete information, in which depositors (sometimes irrationally) expect the bank to fail, thereby causing its failure). Information failures arguably are only part of the cause of bank runs, however; even if an information failure initiates a run on a bank, depositors with perfect information face the collective action problem that they may have to join the run in order to avoid losing the grab race.

Similarly, rationality failure could cause the prices of securities in a large financial market to collapse. In 2008, for example, the realization that some investment-grade-rated mortgage-backed securities (MBS) were defaulting or being downgraded caused investors to panic. They lost faith in ratings and dumped all types of rated debt securities, causing debt-market prices to plummet and (for a time) destroying those markets as a source of corporate financing.<sup>36</sup> Investor panics can occur in other contexts, like investors in Greek sovereign bonds dumping not only those bonds but also the bonds of many other Euro-zone countries.<sup>37</sup>

*2. How Exemplary Could Microprudential Regulation Become?* As discussed, systemically consequential market failures are inevitable, notwithstanding exemplary microprudential regulation. Unfortunately, real-world microprudential regulation will be far from exemplary, making systemically consequential market failures even more likely.

For example, policymakers and thus regulators tend to focus on what historically has gone wrong. Economist Barry Eichengreen calls this “the powerful role of historical perception as a framing device.”<sup>38</sup> Thus, the opinions of European policymakers designing the European Union’s monetary union were “heavily informed by past risks,” notably the possibility that excessive budget deficits could spark high inflation (such as the German hyperinflation of the 1920s).<sup>39</sup> As a result, EU policymakers ignored emerging problems, like the fact that Euro-Area banks were even more highly leveraged than U.S. banks.<sup>40</sup>

Real-world microprudential regulation will also be far from exemplary because regulators respond to the media, which emphasizes what’s accessible to journalists. Even

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<sup>36</sup> [cite]

<sup>37</sup> Barry Eichengreen, *Euro Area Risk (Mis)management*, in *RECALIBRATING RISK: CRISES, PERCEPTIONS, AND REGULATORY CHANGE* (Edward Balleisen et al., eds., 2014).

<sup>38</sup> Eichengreen, *supra* note 37, at [cite].

<sup>39</sup> *Id.* at [cite].

<sup>40</sup> *Id.* at [cite].

sophisticated journalists are sometimes imprecise and biased.<sup>41</sup> Yet another problem with microprudential regulation is that, after a financial crisis, people naturally want to prevent the next crisis. Regulators, who are themselves usually subject to political short-termism,<sup>42</sup> therefore respond by focusing on ex ante preventative regulation, or at least regulation aimed at preventing the next financial meltdown. But that focus is insufficient because it's impossible to always predict the cause of the next financial crisis. Indeed, although panics are often the triggers that commence a chain of systemic failures, it is impossible even to identify all the causes of panics.

Effective regulation must therefore also be ex post ameliorative.<sup>43</sup> Next consider that in the larger context of macroprudential regulation.

### III. MACROPRUDENTIAL REGULATION

There are at least two ways in which macroprudential regulation could protect the financial system, qua system. First, it could attempt to limit the triggers of systemic risk. Second, it could attempt to limit the transmission and impact of systemic shocks.

#### A. Limiting the Triggers of Systemic Risk

Ideal macroprudential regulation would act ex ante, eliminating the triggers of systemic risk.<sup>44</sup> For example, a classic trigger of systemic risk is a bank run, in which some depositors panic and converge on a bank in a “grab race” to withdraw their monies first. Because banks keep only a small fraction of their deposits on hand as cash reserves,

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<sup>41</sup> [cite]

<sup>42</sup> See *supra* note 4.

<sup>43</sup> See Iman Anabtawi & Steven L. Schwarcz, *Regulating Ex Post: How Law Can Address the Inevitability of Financial Failure*, 92 TEXAS LAW REVIEW 75 (2013). Cf. Eichengreen, *supra* note 37, at [cite] (observing that “Not all risks that materialize can be anticipated, and not all risks that are anticipated can be avoided.”).

<sup>44</sup> Cf. Steven L. Schwarcz, Keynote Address: *Ex Ante Versus Ex Post Approaches to Financial Regulation*, 15 CHAPMAN LAW REVIEW 257, 258 (2011) (observing that “[o]nce a failure occurs, there may already be economic damage, and it may be difficult to stop the failure from spreading and becoming systemic”).

other depositors may have to join the run in order to avoid losing the grab race.<sup>45</sup> If there is insufficient cash to pay all withdrawal-demands, the bank will default.<sup>46</sup> That, in turn, can cause other banks or their creditors to default.<sup>47</sup> The standard regulatory solution is to prevent a depositor panic by providing government deposit insurance.<sup>48</sup>

Realistically, however, we cannot eliminate all of the triggers of systemic risk. For example, corporate finance is increasingly becoming disintermediated, bypassing traditional bank intermediation (e.g., bank lending) between the sources of funds (essentially the capital and other financial markets) and business firms that need funds to operate. By bypassing banks, firms are able to avoid the profit mark-up that banks charge on their loans. The system for generating disintermediated credit is often referred to as “shadow banking.”<sup>49</sup> The size of the shadow-banking system—which includes securitization, money-market mutual funds, hedge funds, and repo financing—was

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<sup>45</sup> See, e.g., Jonathan R. Macey & Geoffrey P. Miller, *Bank Failures, Risk Monitoring, and the Market for Bank Control*, 88 COLUMBIA LAW REVIEW 1153, 1156 (1988) (linking bank runs and depositor collective action problems).

<sup>46</sup> R. W. HAFER, *THE FEDERAL RESERVE SYSTEM: AN ENCYCLOPEDIA* 145 (2005) (observing that a bank’s cash reserves are often less than five percent of its deposits).

<sup>47</sup> See Chris Mundy, *The Nature of Risk: The Nature of Systemic Risk—Trying to Achieve a Definition*, BALANCE SHEET, Jan. 2004, at 29 (referring to bank runs as the “classic systemic risk”).

<sup>48</sup> See, e.g., Douglas W. Diamond & Philip H. Dybvig, *Banking Theory, Deposit Insurance, and Bank Regulation*, 59 J. BUS. 55, 63–64 (1986) (analyzing optimal contracts that prevent bank runs and observing that government provision of deposit insurance can produce superior contracts). It might be argued that the direct effect of deposit insurance, protecting individual depositors, is somewhat misguided because depositors are contracting creditors of the bank. The indirect effect, however, is to protect the bank itself from a run.

<sup>49</sup> See Steven L. Schwarcz, *Regulating Shadow Banking*, 31 REVIEW OF BANKING & FINANCIAL LAW 619 (2012), also available at <http://ssrn.com/abstract=1993185>.

estimated at \$60 trillion worldwide in December 2011,<sup>50</sup> and a more recent estimate suggests an even higher number.<sup>51</sup>

Shadow banking can create the equivalent of a bank run to the extent it engages in short-term funding of long-term projects.<sup>52</sup> In the securitization context, for example, asset-backed commercial paper (ABCP) conduits and structured investment vehicles (SIVs) routinely issue short-term commercial paper to fund long-term loans or other investments.<sup>53</sup> Money-market mutual funds also provide short-term loans, essentially

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<sup>50</sup> See Philipp Halstrick, *Tighter Bank Rules Give Fillip to Shadow Banks*, REUTERS (Dec. 20, 2011, 4:17 AM), <http://www.reuters.com/article/2011/12/20/uk-regulation-shadow-banking-idUSLNE7BJ00T20111220> (last visited June 10, 2013) (indicating that shadow banking is a \$60 trillion industry).

<sup>51</sup> See FIN. STABILITY BD., GLOBAL SHADOW BANKING MONITORING REPORT (2012), [http://www.financialstabilityboard.org/publications/r\\_121118c.pdf](http://www.financialstabilityboard.org/publications/r_121118c.pdf) (estimating shadow banking's worldwide assets as \$67 trillion in 2011).

<sup>52</sup> See, e.g., Viral V. Acharya & S. Viswanathan, *Leverage, Moral Hazard, and Liquidity*, 66 JOURNAL OF FINANCE 99, 103 (2011) (observing that short-term funding of long-term projects “played an important role in the financial crisis of 2007 to 2009 and the period preceding it”); Kyle Glazier, *Bernanke: Financial Crisis Was a Structural Failure*, BOND BUYER, Apr. 13, 2012, at 2, <http://www.bondbuyer.com/news/bernanke-speech-financial-crisis-structural-failure-1038520-1.html?partner=sifma> (last visited June 17, 2013) (quoting Federal Reserve Board Chairman Ben Bernanke as saying that “a key vulnerability of the [disintermediated financial] system was the heavy reliance . . . on various forms of short-term wholesale funding”); cf. *Regulating Shadow Banking*, supra note 49, at 625 n.30 (arguing “that the instability of short-term ‘money-like’ securities is the central problem for regulatory policy” in the disintermediated financial system); Martin H. Wolfson, *Minsky’s Theory of Financial Crisis in a Global Context*, 36 J. ECON. ISSUES 393, 394 (2002) (describing Minsky’s theory that market fragility grows as debt levels rise and that the proportion of debt will increase as firms use short-term debt to fund long-term financial assets). Economists sometimes refer to the short-term funding of long-term projects as a form of maturity transformation or as an asset-liability mismatch. See, e.g., Huberto M. Ennis & Todd Keister, *Bank Runs and Institutions: The Perils of Intervention*, 99 AM. ECON. REV. 1588, 1590 (2009) (“Money market funds and other arrangements perform maturity transformation by investing in long-term assets while offering investors the ability to withdraw funds on demand.”).

<sup>53</sup> The business model of ABCP conduits and SIVs is very similar to that of banks in that they borrow short-term and lend long-term. See, e.g., *Structured Investment Vehicle Definition*, MONEYTERMS.CO.UK, <http://moneyterms.co.uk/siv/> (last visited Jan. 14, 2013) (discussing the business model of SIVs).

withdrawable on demand, to fund long-term projects.<sup>54</sup> Additionally, repo lending by securities lenders is almost always short term. The driving force behind much of the short-term funding of long-term projects is the reality that the interest rate on short-term debt is usually lower than that on long-term debt because, other things being equal, there is less interest-rate risk and it is easier to assess an obligor's ability to repay in the short term than in the long term.

Short-term funding of long-term projects can be efficient so long as the firm issuing the short-term debt will be able to “roll over” that debt (i.e., repay its maturing short-term debt from the proceeds of newly borrowed short-term debt), if needed. Thus, the traditional business of banking uses short-term deposits (loans from depositors) to make long-term loans to bank customers. But if a short-term lender is unable to roll over its debt, it could default, with potentially systemic consequences.<sup>55</sup>

The short-term funding of long-term projects is merely one mechanism by which systemic risk could be triggered. As mentioned, systemic risk can also be triggered by financial panics,<sup>56</sup> yet it is impossible to identify all the causes of panics.<sup>57</sup> Moreover, so long as firms operate under a limited liability management regime, systemic risk can even be triggered by rational management decisions. I have already observed that limited-

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<sup>54</sup> See Bryan J. Noeth, et al., *Is Shadow Banking Really Banking?*, 19 REGIONAL ECONOMIST 8, 9 (2011) (describing the use of money market mutual funds to “provide short term loans that are essentially withdrawable on demands”).

<sup>55</sup> Federal Reserve Board economists thus argue that the inability of many ABCP conduits to roll over their short-term commercial paper in the last five months of 2007 “played a central role in transforming concerns about the credit quality of mortgage-related assets into a global financial crisis.” Daniel Covitz, Nellie Liang & Gustavo Suarez, *The Evolution of a Financial Crisis: Panic in the Asset-Backed Commercial Paper Market* 1 (Fed. Reserve Bd. Fin. and Discussion Series, Working Paper #2009-36, 2009), <http://www.federalreserve.gov/pubs/feds/2009/200936/200936pap.pdf>. The European Central Bank also has identified short-term funding of long-term projects as “a major amplification mechanism in situations of stress,” which can particularly “foster systemic risks . . . if [it] takes place outside the regulated [financial] system.” KLARA BAKK-SIMON ET AL., EUROPEAN CENT. BANK, OCCASIONAL PAPER NO. 133, SHADOW BANKING IN THE EURO AREA: AN OVERVIEW, at 24 (Apr. 2012).

<sup>56</sup> See *supra* notes 25 & 35-37 and accompanying text.

<sup>57</sup> See *supra* note 43 and accompanying text.

liability firms may well decide to engage in profitable transactions that increase systemic risk, because much of the harm from a possible systemic collapse would be externalized onto others.<sup>58</sup>

Policymakers considering macroprudential regulation should examine the appropriate role of limited liability, especially for the small and decentralized firms (such as hedge funds) that dominate the shadow-banking sector, where equity investors tend to be active managers.<sup>59</sup> Limited liability gives these investor-managers strong incentives to take risks that could generate out-size personal profits, even if that greatly increases systemic risk.<sup>60</sup> The law does not effectively mitigate these systemic externalities. Although tort law, for example, focuses on internalizing externalities by empowering injured third parties to sue for harm, plaintiffs normally must show their harm to be a causal and foreseeable consequence of the tortfeasor's actions. Systemic harm, however, is caused indirectly and affects a wide range of third parties in unpredictable ways.<sup>61</sup> For shadow-banking firms subject to this conflict, limited liability should be redesigned to better align investor and societal interests.<sup>62</sup>

There may well be other reasons why we cannot eliminate all of the triggers of systemic risk. Economists focus, for example, on monitoring; from that standpoint, problems are inevitable because it is impossible to monitor everything in the financial

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<sup>58</sup> See *supra* note 12 and accompanying text.

<sup>59</sup> Steven L. Schwarcz, *The Governance Structure of Shadow Banking: Rethinking Assumptions About Limited Liability*, forthcoming [cite to LAW REVIEW].

<sup>60</sup> *Id.*

<sup>61</sup> *Id.*

<sup>62</sup> Regardless of how limited liability is redesigned, however, it faces the dilemma that investor-managers would have relatively little incentive to monitor and guard against their firm's potential to trigger systemic risk if tort law bars third parties injured by systemic harm from recovering damages. *Id.* A possible solution to this dilemma would be to couple the redesigned limited liability with a privatized systemic risk fund—which would be used to mitigate systemic harm—into which systemically risky shadow-banking firms would be required to contribute. If their firm has insufficient capital to make these contributions, investor-managers would become personally liable for all or a portion of the contribution, thereby motivating them to monitor and help control their firm's systemically risky behavior. *Id.*



system.<sup>63</sup> Another reason we cannot eliminate the triggers of systemic risk is that we often lack empirical evidence on regulatory cause and effect. As a result, macroprudential financial regulation—like microprudential regulation<sup>64</sup>—will sometimes be imperfect.

This imperfection can be illustrated by the special protections given to creditors in derivatives transactions under bankruptcy and insolvency law. These protections, which are claimed to be necessary to mitigate systemic risk,<sup>65</sup> not only are arguably the most important example of macroprudential regulation in the United States but also serve as “an important precedent” for macroprudential regulation worldwide.<sup>66</sup> At least in part, however, these protections are a path-dependent outcome of decades of sustained industry pressure on Congress to exempt the derivatives market from the reach of bankruptcy law.<sup>67</sup> Although the earliest such protection lacked any empirical evidence of efficacy to mitigate systemic risk, once enacted as law it served as precedent for subsequent broader protections.<sup>68</sup> Recent research suggests, however, that these protections can have unintended adverse consequences, possibly even *increasing* systemic risk.<sup>69</sup>

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<sup>63</sup> Eugene N. White, Professor of Economics, Rutgers University (statement at Chatham House conference, *supra* note 1) (Dec. 6, 2013).

<sup>64</sup> *Cf. supra* notes 37-43 and accompanying text (explaining why microprudential regulation will sometimes be imperfect).

<sup>65</sup> *See, e.g.*, Stephen D. Adams, “Derivative Exemptions in Bankruptcy and Dodd Frank: A Structural Analysis,” Working Paper Draft (Dec. 2, 2013), at 10-13, available at <http://ssrn.com/abstract=2348828> (discussing that systemic risk has been central to justifying these protections and noting both the unanimity and vagueness of the discussions); Steven L. Schwarcz & Ori Sharon, *The Bankruptcy-Law Safe Harbor for Derivatives: A Path-Dependence Analysis*, 71 WASHINGTON AND LEE LAW REVIEW issue no. 3 (forthcoming 2014) (explaining the history of these protections).

<sup>66</sup> *Id.*

<sup>67</sup> *Id.*

<sup>68</sup> *Id.* Overreliance on this precedent was almost certainly fostered by both the complexity of derivatives and uncertainty over how systemic risk is created and transmitted. Being concerned about systemic risk, members of Congress tended to see what they expected to see, the expectation in this case being driven by powerful derivatives-industry lobbying pressure. From a public choice standpoint, no powerful interest groups presented Congress with opposing views. *Id.*

<sup>69</sup> *Id.* *See also* DAVID SKEEL, *THE NEW FINANCIAL DEAL: UNDERSTANDING THE DODD-FRANK ACT AND ITS (UNINTENDED) CONSEQUENCES*, 135 (2011); Mark J. Roe, *The*

## B. Limiting the Transmission and Impact of Systemic Shocks

It therefore is virtually certain that the financial system will face systemic shocks from time to time. Any macroprudential regulatory framework should therefore be designed to also act ex post, after a systemic shock is triggered, by breaking the transmission of the shock and limiting its impact. This approach takes inspiration from chaos theory, which holds that in complex engineering systems—and, I have argued, also in complex financial systems—failures are almost inevitable.<sup>70</sup>

To break the transmission of systemic failures would require that the transmission mechanisms all be identifiable. It is probably not feasible, however, to identify all those mechanisms in advance.<sup>71</sup> We therefore need to also find ways to limit the impact of systemic shocks. This could be done by trying to stabilize systemically important firms and financial markets impacted by the shocks.<sup>72</sup> There are at least three ways that regulation could accomplish that: by ensuring liquidity to those firms and markets, by requiring those firms to be more robust, and by ring-fencing.

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*Derivatives Market's Payment Priorities as Financial Crisis Accelerator*, 63 STANFORD LAW REVIEW 539, 561 (2010-2011); Stephen J. Lubben, *Repeal The Safe Harbor*, 18 AMERICAN BANKRUPTCY INSTITUTE LAW REVIEW 319, 331 (2010); Bryan G. Faubus, *Narrowing the Bankruptcy Safe Harbor for Derivatives to Combat Systemic Risk*, 59 DUKE LAW JOURNAL 801, 828-29 (2009-2010); Stephen J. Lubben, *Derivatives and Bankruptcy: The Flawed Case for Special Treatment*, 12 UNIVERSITY OF PENNSYLVANIA JOURNAL OF BUSINESS LAW 61, 75 (2009); Franklin R. Edwards & Edward R. Morrison, *Derivatives and the Bankruptcy Code: Why the Special Treatment?*, 22 YALE JOURNAL ON REGULATION 91, 95 (2005).

<sup>70</sup> See *Regulating Complexity in Financial Markets*, *supra* note 6, at 248-49. One aspect of chaos theory is deterministic chaos in dynamic systems, which recognizes that the more complex the system, the more likely it is that failures will occur. Thus, the most successful (complex) systems are those in which the consequences of failures are limited. In engineering design, for example, this can be done by decoupling systems through modularity that helps to reduce a chance that a failure in one part of the system will systemically trigger a failure in another part.

<sup>71</sup> Anabtawi & Schwarcz, *supra* note 26, at [cite].

<sup>72</sup> See *Regulating Ex Post*, *supra* note 43.

*1. Ensuring Liquidity to Firms and Markets.* Liquidity has traditionally been used, especially by government central banks, to help prevent financial firms from defaulting. Ensuring liquidity to stabilize systemically important firms would follow this pattern, except that the source of the liquidity could at least be partly privatized by taxing those firms to create a systemic risk fund.

The precedents for requiring the private sector to contribute funds to help internalize externalities include the U.S. Federal Deposit Insurance Corporation (FDIC), which requires member banks to contribute to a Deposit Insurance Fund to ensure that depositors of failed banks are repaid.<sup>73</sup> Similarly, U.S. law requires each owner of a nuclear reactor to contribute monies to a fund to compensate for possible reactor accidents.<sup>74</sup>

In the systemic risk context, privatizing the source of liquidity would likewise help to internalize externalities by addressing the dilemma that market participants are economically motivated to create externalities that could have systemic consequences.<sup>75</sup> Privatization would not only offset the cost to taxpayers of liquidity advances that are not repaid but also, if structured appropriately,<sup>76</sup> should reduce moral hazard by discouraging fund contributors—including those that believe they are “too big to fail”—from engaging in financially risky activities. The likelihood that systemically important firms will have to make additional contributions to the fund to replenish bailout monies should also motivate those firms to monitor each other and help control each other’s risky behavior.<sup>77</sup>

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<sup>73</sup> See *infra* note 76.

<sup>74</sup> U.S. NUCLEAR REG. COMM’N, *Fact Sheet on Nuclear Insurance and Disaster Relief Funds*, <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/funds-fs.html> (last updated June 9, 2011).

<sup>75</sup> Cf. Jeffrey N. Gordon & Christopher Muller, *Confronting Financial Crisis: Dodd-Frank’s Dangers and the Case for a Systemic Emergency Insurance Fund*, 28 YALE JOURNAL ON REGULATION 151, 156 (2011) (calling for a systemic emergency insurance fund that is funded by the financial industry).

<sup>76</sup> For example, required contributions could be sized as a function, among other factors, of the contributor’s financially risky activities.

<sup>77</sup> The European Commission has been considering the idea of a systemic risk fund in connection with its proposal to tax the financial sector. European Commission, *Taxation*

It is not enough to try to stabilize systemically important firms. Financial markets—which are now as much a part of the financial system as financial firms<sup>78</sup>—can also be triggers and transmitters of systemic risk. Liquidity can be used to stabilize systemically important financial markets.<sup>79</sup> For example, in response to the post-Lehman collapse of the commercial paper market, the U.S. Federal Reserve created the Commercial Paper Funding Facility (“CPFF”) to act as a lender of last resort for that market, with the goal of addressing “temporary liquidity distortions” by purchasing commercial paper from highly rated issuers that could not otherwise sell their paper.<sup>80</sup> The CPFF helped to stabilize the commercial paper market.<sup>81</sup>

2. *Requiring Firms to be More Robust.* Regulation could also help to stabilize systemically important firms by requiring them to be more robust.<sup>82</sup> This could be accomplished in various ways.

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*of the Financial Sector*, a Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: (Brussels COM (2010) 549/5; SEC (2010) 1166). *See also* European Draft Directive on a Common System of Financial Tax (Sept. 28, 2011), available at [http://ec.europa.eu/taxation\\_customs/taxation/other\\_taxes/financial\\_sector/index\\_en.htm](http://ec.europa.eu/taxation_customs/taxation/other_taxes/financial_sector/index_en.htm). News reports indicate that an originally contemplated use was a systemic risk fund. *Commission Proposes a Bank Tax to Cover the Costs of Winding Down Banks that Go Bust* (May 26, 2010), available at [http://ec.europa.eu/news/economy/100526\\_en.htm](http://ec.europa.eu/news/economy/100526_en.htm) (last visited Mar. 1, 2011). [Update-cite1]

<sup>78</sup> *See Systemic Risk*, *supra* note 3, at [cite].

<sup>79</sup> This was first proposed in *Systemic Risk*, *supra* note 3, at 225-30.

<sup>80</sup> *See* Tobias Adrian, Karin Kimbrough, & Dina Marchioni, *The Federal Reserve’s Commercial Paper Funding Facility*, FED. RESERVE BANK OF N.Y. STAFF REPORT NO. 423 (April 1, 2010).

<sup>81</sup> *Id.* at 11 (concluding that “[t]he CPFF indeed had a stabilizing effect on the commercial paper market”).

<sup>82</sup> Although I refer to regulation requiring firms to become more robust as ex post (in the sense that more robust firms can better withstand a systemic shock), such regulation could also be viewed as ex ante in the sense that robust firms are less likely to fail and thereby trigger a systemic shock.

Regulation has long been focused on requiring traditional deposit-taking banks to be robust, usually through capital and solvency requirements.<sup>83</sup> Furthermore, to ensure their liquidity, banks generally have had access to central bank liquidity, ensuring they can pay their debts. Since the financial crisis, laws like the Dodd-Frank Act are beginning to also require other “systemically important” financial firms to be subject to a range of capital and similar requirements.<sup>84</sup>

The extent to which these types of approaches will work, and their potential impact on efficiency, are open questions. Reducing a firm’s leverage, for example, can certainly enable the firm to withstand economic shocks and reduce its chance of failure. The Basel capital requirements, however, did not prevent the many bank failures resulting from the global financial crisis. Setting regulatory limits on leverage could also backfire because some leverage is good but there is no optimal across-the-board amount of leverage that is right for every firm.

Another way that regulation could make systemically important firms more robust is by requiring at least some portion of their debt to be in the form of so-called contingent capital.<sup>85</sup> Contingent capital debt would automatically convert to equity upon the occurrence of pre-agreed events. Requiring contingent capital is therefore effectively like requiring a pre-planned debt restructuring or workout. But it is unclear if regulatory-imposed contingent capital would be efficient.<sup>86</sup> If contingent capital is a good idea,

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<sup>83</sup> See *Systemic Risk*, *supra* note 3, at 210 (“Historically, regulation of systemic risk has focused largely on prevention of bank failure.”).

<sup>84</sup> Dodd-Frank Act §§ 115(b) & 165(i). The Dodd-Frank Act directs the Federal Reserve, for example, to set “prudential” capital standards for certain large financial firms, including a maximum debt-to-equity ratio of 15:1. *Id.* § 165(j). [Also address potential SIFI access to central bank liquidity under Dodd-Frank. cite1]

<sup>85</sup> See, e.g., John C. Coffee, Jr., *Systemic Risk After Dodd-Frank: Contingent Capital and the Need for Regulatory Strategies Beyond Oversight*, 111 COLUMBIA LAW REVIEW 795 (2011).

<sup>86</sup> As of July 2011, the Basel Committee has determined that systemically important financial firms will only be allowed to meet their additional loss absorbency requirement with common equity Tier 1 capital, not contingent capital. The Basel Committee will, however, “continue to review contingent capital, and support the use of contingent capital to meet higher national loss absorbency requirements than the global requirement, as

markets themselves should implement it; but there is no evidence of that implementation (nor is there evidence of market failures impeding that implementation). Regulatory-imposed contingent capital might also have unforeseen consequences. For example, automatic conversions of debt claims to equity interests might create counterparty risk by reducing the value of firms holding those claims.

3. *Ring-Fencing*. Another way that regulation could help to limit the impact of systemic shocks is through ring-fencing. When used as a form of financial regulation, ring-fencing can best be understood as legally deconstructing a firm in order to more optimally reallocate and reduce risk.<sup>87</sup>

The deconstruction could occur in various ways. For example, the firm could be made more internally viable, such as by separating risky assets from the firm and preventing the firm from engaging in risky activities or investing in risky assets.<sup>88</sup> The firm could also be protected from external risks, such as ensuring that the firm is able to operate on a standalone basis even if its affiliates fail and insulating the firm from third-party claims, involuntary bankruptcy, and affiliate abuse.<sup>89</sup>

Although ring-fencing represents another way that regulation could help to limit the impact of systemic shocks, ring-fencing can also help to limit the triggers and transmission of systemic shocks.<sup>90</sup> Thus, the so-called Volcker Rule, which imposes limitations on proprietary trading in order to prevent systemically important financial

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high-trigger contingent capital could help absorb losses on a going concern basis.” Bank for Int’l Settlements, *Consultative Document: Global Systemically Important Banks: Assessment Methodology and the Additional Loss Absorbency Requirement*, at 19-20 (July 2011), <http://www.bis.org/publ/bcbs201.pdf>.

<sup>87</sup> Steven L. Schwarcz, *Ring-Fencing*, 87 SOUTHERN CALIFORNIA LAW REVIEW issue no. 1 (forthcoming 2014); available at <http://ssrn.com/abstract=2228742>.

<sup>88</sup> *Ring-Fencing*, *supra* note 87, at [cite].

<sup>89</sup> *Id.* at [cite].

<sup>90</sup> Ring-fencing to make a firm more internally viable also overlaps with the earlier discussion of requiring firms to be more robust. *See supra* notes 82-85 and accompanying text.

firms from investing in risky assets,<sup>91</sup> is effectively a form of ring-fencing.<sup>92</sup> Its primary goal, however, is to prevent losses that could trigger the systemic collapse of those firms.<sup>93</sup>

Ring-fencing's reallocation of risk raises important normative questions about when, and how, it should be used as an economic regulatory tool. For example, ring-fencing is often considered to help protect publicly essential activities performed by utility companies and sometimes considered to help protect publicly beneficial activities performed by banks. The latter is exemplified by the ring-fencing used under the Glass-Steagall Act<sup>94</sup> and proposed in the final report of the U.K. Independent Commission on Banking (often called the Vickers Report<sup>95</sup>). The Vickers Report recommends a limited form of separation intended to protect the “basic banking services of safeguarding retail deposits, operating secure payments systems, efficiently channelling savings to productive investments [i.e., making loans], and managing financial risk.”<sup>96</sup>

From a cost-benefit standpoint, ring-fencing is highly likely to be appropriate to help protect the publicly essential activities performed by utility companies, such as providing power, clean water, and communications.<sup>97</sup> Not only are those services necessary but the utility company, normally being a monopoly, is the only entity able to

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<sup>91</sup> See Dodd-Frank Act sec. 619, § 13.

<sup>92</sup> See text accompanying note 88, *supra* (observing that ring-fencing includes preventing a firm “from engaging in risky activities or investing in risky assets”).

<sup>93</sup> [cite]

<sup>94</sup> In the United States, the Glass-Steagall Act (which has since been revoked) had created a separation between commercial and investment banking—the former including deposit taking and lending, the latter including securities underwriting and investing.

<sup>95</sup> Although I provided input for this Report in a November 12, 2010 meeting at All Souls College, University of Oxford, with Commission Chairman Sir John Vickers and other members of the Commission's Secretariat, I did not suggest the ring-fencing procedure that the Report eventually adopted.

<sup>96</sup> Vickers Report, at 7. Ring-fencing is more of a microprudential than macroprudential approach to the extent its focus is more on protecting retail banking activities rather than on preventing systemic collapse.

<sup>97</sup> *Ring-Fencing*, *supra* note 87.

provide the services. Ring-fencing utility companies against risk helps assure the continuity of their services.

It is less certain, though, that ring-fencing should be used to help protect other publicly beneficial activities. For example, even if the public services provided by banks were as important as those provided by public utilities,<sup>98</sup> the need to ring-fence banks would not be as strong as the need to ring-fence public utilities. That's because the market for banking services is competitive. If some risky banks become unable to provide services, other banks should be able to provide substitute services.<sup>99</sup> It therefore is uncertain whether the benefits of ring-fencing banks would exceed its costs.

Ring-fencing could also be used to help protect the financial system itself, by mitigating systemic risk and the related too-big-to-fail problem of large banks and other financial institutions.<sup>100</sup> The competing costs and benefits of using ring-fencing for those purposes, however, would be highly complex. Not only would they depend, among other things, on the ways in which the ring-fencing is structured; they also would have to be compared to the costs and benefits of other regulatory approaches to mitigating systemic risk.<sup>101</sup>

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<sup>98</sup> I use this example solely as an illustration. I do not suggest that the public services provided by banks are as important as those provided by public utilities.

<sup>99</sup> Substitutability is one of three primary factors—the others being interconnectedness and size—by which the Financial Stability Board assesses systemic risk. *See* FSB, [cite to its systemic risk criteria] (2009). The more substitutable something is, the less systemically risk would be its loss.

<sup>100</sup> This is the purpose of ring-fencing proposed for systemically important financial institutions under the Dodd-Frank Act.

<sup>101</sup> There remains controversy, for example, over the desirability of implementing the Volcker Rule, which paternalistically substitutes a blanket regulatory prescription for a firm's own business judgment. [cite to the current controversy] One should be generally skeptical of any rule that attempts to protect a sophisticated financial firm from itself—and indeed, Moody's has warned that a leaked early draft of interagency rules implementing the Volcker Rule would, if adopted, probably “diminish the flexibility and profitability of banks' valuable market-making operations and place them at a competitive disadvantage to firms not constrained by the rule.” Edward Wyatt, *Regulators to Set Forth Volcker Rule*, N.Y. TIMES, Oct. 10, 2011 (quoting Moody's). On the other hand, the fact that limited-liability firms may well rationally decide to engage in



#### IV. CONCLUSIONS

An effective regulatory framework to help control systemic risk must look beyond politics and blame. Because systemic risk is a form of financial risk, the framework should start with “microprudential” regulation, designed to maximize economic efficiency by correcting market failures within the financial system. This part of the framework is additionally important because certain of those market failures can be factors in triggering systemic risk.

Because systemic risk represents risk to the financial system itself, the regulatory framework must also include the larger “macroprudential” goal of protecting the financial system as a “system.” To that end, regulation should start by attempting to eliminate the remaining triggers of systemic risk. For many reasons, however, regulation cannot successfully accomplish that. Taking inspiration from chaos theory,<sup>102</sup> the regulatory framework must therefore also attempt to limit the transmission and impact of the systemic shocks that inevitably will be triggered.

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profitable transactions that increase systemic risk (*see supra* note 12 and accompanying text) suggests that the Volcker Rule may not be completely misguided. The Volcker Rule has not, however, been subjected to a rigorous cost-benefit analysis or compared to the costs and benefits of other regulatory approaches to mitigating systemic risk. [cite]

<sup>102</sup> Chaos theory holds that in complex systems, failures are almost inevitable. *See supra* notes 70-72 and accompanying text.