CHAPMAN UNIVERSITY SCHOOL OF LAW

TRANSCRIPTION OF 2011 *CHAPMAN LAW REVIEW* SYMPOSIUM: "FROM WALL STREET TO MAIN STREET: THE FUTURE OF FINANCIAL REGULATION"

KEYNOTE ADDRESS: "EX ANTE VERSUS EX POST APPROACHES TO FINANCIAL REGULATION"*

FRIDAY, JANUARY 28, 2011

KEYNOTE SPEAKER:

*STEVEN L. SCHWARCZ***

 This article is based on The Chapman Dialogue Series and Law Review Symposium Keynote Address, delivered on January 28, 2011.

** Stanley A. Star Professor of Law & Business, Duke University School of Law; Founding/Co-Academic Director, Duke Global Capital Markets Center. E-mail: schwarcz@law.duke.edu. The author thanks Iman Anabtawi and Barak Richman for valuable comments.

In a financial context, regulation can have two impacts. First, it can help to prevent financial failures. I will call this an ex ante, or 'preventive,' approach to financial regulation. Second, regulation can help to mitigate the harm from financial failures. I will call that an ex post, or 'mitigative,' approach to financial regulation.

Some commentators frame an ex ante/ex post regulatory distinction around conduct: regulation that targets bad conduct before it occurs is deemed ex ante, whereas regulation that targets bad conduct after it occurs is deemed ex post.[1]

It makes sense to frame the distinction around conduct if one assumes, as do those commentators, that bad conduct will be deterred if targeted with appropriate regulatory penalties, whether ex ante or ex post. In the context of my talk, however, regulators do not and (I show) *cannot* know all the conduct that leads to financial failures. Moreover, factors other than conduct can lead to financial failures.[2]

Framing the ex ante/ex post distinction around conduct would thus be misleading. I therefore frame the distinction around the impact of the regulation (again, ex ante regulation focuses on preventing financial failures, ex post regulation focuses on mitigating the harm from financial failures).

INTRODUCTION

Ideal financial regulation would work ex ante, to prevent financial failures. Once a failure occurs, there may already be economic damage, and it may be difficult to stop the failure from spreading and becoming systemic.

The reality, though, is that preventing financial failures should be only one role for regulators. Even an optimal prophylactic regulatory regime cannot anticipate and prevent every failure. For example, financial panics are often the failures

1 The choice of ex ante versus ex post regulatory penalties will depend on such factors as the policing capacity of ex ante penalties, the cost of consequences resulting from the conduct compared with the cost of preventing the conduct, and the ability to know what conduct leads to bad consequences. *See, e.g.*, STEVEN SHAVELL, FOUNDATIONS OF ECONOMIC ANALYSIS OF LAW 87–91, 428–30, 479–82, 492–520, 572–78 (2004); Christopher Boerner & Barak D. Richman, *A Transaction Cost Economizing Approach to Regulation: Understanding the NIMBY Problem and Improving Regulatory Responses*, 23 YALE J. ON REG. 29, 58–66 (2006) (offering a way to compare alternative regulatory regimes).

2 And, regulation that helps mitigate the consequences of financial failures, such as creating financial safety nets, might even perversely affect conduct, fostering moral hazard in parties that believe they are too big to fail. *See infra* Part II.A.

that trigger systemic collapse.[3] But regulation aimed at preventing financial panics cannot anticipate all the causes of the panics.[4] And even when identified, panics cannot always be averted easily because investors are not always rational.[5]

One might also argue that some failures could be avoided by reducing leverage in the financial system. Reducing leverage reduces the risk that a financial institution will default and also reduces the likelihood that a default at one financial institution will cause defaults at other institutions.[6] But regulation limiting leverage could create significant costs. Some leverage is good, enabling a firm to operate efficiently and grow; and there is no optimal across-the-board leverage ratio that is right for every financial firm.[7]

Analysis of financial failures underlying the recent global recession further indicates that ex ante regulation cannot anticipate and prevent every failure. These failures can be attributed conceptually to at least four market imperfections: (1) conflicts of interest; (2) complacency of investors and other market participants; (3) complexity of financial markets and of the securities traded therein; and (4) "a type of tragedy of the commons" in which "the benefits of exploiting finite capital resources accrue to individual market participants," each of whom is motivated to maximize use of the resource, whereas the costs of exploitation are distributed more widely.[8] Government can probably manage conflicts, and it can also reduce the tragedy of the commons (such as by creating a systemic risk fund to which systemically important firms are required to contribute, thereby internalizing costs and motivating a degree of self-monitoring by those firms—both individually and collectively—against externalities).[9]

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3 Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L.J. 193, 214 (2008) [hereinafter Schwarcz, *Systemic Risk*].

4 *Id.* at 216.

5 Iman Anabtawi & Steven L. Schwarcz, *Regulating Systemic Risk: Towards an Analytical Framework*, 86 NOTRE DAME L. REV. (forthcoming 2011) (manuscript at 38), *available at* http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=2924&context=faculty_scholarship.

6 Schwarcz, *Systemic Risk*, *supra* note 3, at 223.

7 *Id.* at 224.

8 Steven L. Schwarcz, *Understanding the Subprime Financial Crisis*, 60 S.C. L. REV. 549, 561–62 (2009) (quoting Steven L. Schwarcz, *Protecting Financial Markets: Lessons from the Subprime Mortgage Meltdown*, 93 MINN. L. REV. 373, 406 (2008)).

9 This approach was originally in the Dodd-Frank Act, but it was taken out at the last minute because of opposition by politicians who believed (in my opinion, wrongly) that it would increase moral hazard by institutionalizing bailouts. A privately-funded systemic risk fund not only can mitigate systemic externalities, but also can help minimize the potential for risky behavior caused by institutions that believe they are too big to fail. The too-big-to-fail problem is effectively an externality imposed on government

But government *cannot* fully manage problems of increasing complexity, which makes disclosure an inadequate means of reducing information asymmetry.[10] Furthermore, complex financial markets innovate more quickly than regulators can adapt. Nor can government fully manage problems of complacency; human nature is hard to change, and investors and other market participants do not (even absent a panic) always rationally evaluate risk.

Complete ex ante financial regulation, whereby regulators prevent every failure, is thus a futile goal. And even if it were feasible, it would not necessarily be desirable. Ex ante regulation can provide an incentive for regulatory arbitrage.[11] Furthermore, any ex ante regulation that attempts to prevent all financial failures may end up being too chilling, thereby dampening economic growth.[12] Ex post remedies will therefore always be needed to try to prevent financial failures—when they inevitably occur—from spreading and becoming systemic.

Chaos theory supports this type of reactive approach. In complex engineering systems, failures are inevitable.[13] Therefore, it is important to try to break the transmission of these failures[14] and to limit their systemic consequences.

I first will discuss how to break the transmission of financial failures and thereafter will examine how to limit their systemic consequences. In my analysis, I stand partly on the shoulders of

(and ultimately taxpayers) by an institution engaging in such risky behavior. A privately-funded systemic risk fund would help to internalize that externality. Furthermore, the ability of government to require additional contributions to this type of fund should motivate contributors to the fund to monitor each other to reduce the potential for such risky behavior. The IMF appears to be using the European Commission's recent proposal to tax the financial sector as a platform to announce that new taxes on banks [are] needed to provide an insurance fund for future financial meltdowns and to curb excessive risk-taking.

10 *See* Anabtawi & Schwarcz, *supra* note 5, (manuscript at 40–41). *Cf.* Kathryn Judge, Fragmentation Nodes: A Study in Financial Innovation, Complexity and Systemic Risk 82 (Dec. 14, 2010) (unpublished manuscript) (on file with author) (explaining why market observers and regulators failed to observe the "most pernicious forms of complexity" leading to the recent financial collapse).

11 *See, e.g.*, Samuel W. Buell, *Good Faith and Law Evasion*, 58 UCLA L. REV. (forthcoming Feb. 2011) (manuscript at 7–10) (on file with the Duke University School of Law Scholarship Repository), *available at* http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=2943&context=faculty_scholarship.

12 Lawrence G. Baxter, *Adaptive Regulation in the Amoral Bazaar* 11 (Duke Law Working Papers, Paper No. 53, 2010), *available at* http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=2969&context=faculty_scholarship.

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

14 As to breaking transmission of failures, see Anabtawi & Schwarcz, *supra* note 5, (manuscript at 4).

Professor Iman Anabtawi of UCLA Law School, with whom I have written about and discussed many of these issues.[15]

I. BREAKING THE TRANSMISSION OF FINANCIAL FAILURES

A. Breaking Transmission Chains

Professor Anabtawi and I have recently examined how regulators can identify and try to break the transmission chains of financial failures.[16] Localized financial failures, by themselves, are unlikely to produce systemic effects; but when these failures are transmitted through financial institutions and markets, even relatively small failures can have systemic consequences.

We posit that two otherwise independent correlations can combine to transmit localized financial failures into broader systemic crises. The first is a correlation between a financial institution's financial condition and its exposure to risk from failures consisting of low-probability adverse events. The second is a correlation across financial institutions and markets. Using four financial crises within the past century, we illustrate that these two correlations have at times combined historically to potentiate the systemic transmission of localized financial failures.

Prior to the global recession, for example, subprime mortgage loans were bundled together as collateral to partially support the payment of complex mortgage-backed securities, which were purchased by banks and other financial institutions worldwide. These securities maintained their value so long as home prices appreciated, as they had been doing for decades and as market observers assumed would continue.

When home prices began falling, some of these mortgage-backed securities began defaulting, requiring financial institutions heavily invested in the securities to write down their value, in turn causing these institutions to appear, if not be, financially risky. This reflected a correlation between low probability risk of failure—that home prices would significantly fall and cause defaults—and an institution's financial condition. The global recession also entailed a correlation across financial institutions and markets—*not only* a tight interconnectedness among banks and non-bank financial institutions, *but also* a

15 *See id.* at (manuscript at 1).

16 *See id.* at (manuscript at 62) (arguing that "one focus of optimal regulation should be on attempting to weaken correlations within the financial system that serve to transmit systemic risk").

tight interconnectedness between financial institutions and markets. These correlations combined to facilitate the transmission of localized financial failures into a systemic collapse.

Professor Anabtawi and I recognize the limitations of our approach: one cannot always anticipate all transmission chains of financial failures;[17] and, even after a transmission chain is identified, regulation cannot always break it. We therefore caution that our approach should be only one focus of optimal regulation.

B. Market Circuit Breakers

Another approach to breaking the transmission of financial failures, at least in the context of securities markets, is to install market "circuit breakers." Although increased speed in data transmission is generally associated with market efficiency, the extreme speeds at which algorithmic trading takes place creates a danger that trading in highly automated financial markets will sometimes cause pricing failures.

Last May, for example, the Dow Jones Industrial Average plunged nearly 1000 points in twenty minutes, a pricing failure precipitated by a trader executing an algorithm to sell approximately $4.1 billion worth of derivatives contracts without regard to time or price. In response, the Securities and Exchange Commission (SEC) adopted a universal circuit breaker rule to halt trading of an individual security across all exchanges for five minutes if its price moves up or down ten percent or more within a five-minute period. Assuming a security's price has been pushed below its intrinsic value, a pause should give traders enough time to recognize the disparity and to respond if they believe the security is mispriced.

Although the adoption of a universal circuit breaker rule is intended to increase stability, that rule—like any other risk-management strategy—will be ineffective to the extent it can be eluded by mistake or design. For example, if traders mistakenly believe that a trading halt is based on fundamental valuation issues, the halt could aggravate problems. Market circuit breakers are thus not panaceas, even in the limited securities-market context in which they operate.

17 Professor Anabtawi and I recognize, for example, that additional financial crises have occurred over the past century and longer, and that a complete study of all such crises might indicate additional correlations within the financial system.

II. LIMITING SYSTEMIC CONSEQUENCES

The systemic *consequences* of financial failures also can be limited. Perhaps the most important way to accomplish this is through financial safety nets.

A. Financial Safety Nets

There are at least three categories of safety nets for financial failures: (1) safety nets for debt defaults by banks and other financial institutions; (2) safety nets for pricing failures in financial markets (focusing here on stabilizing price collapses rather than preventing them ab initio through market circuit breakers); and (3) safety nets for sovereign nation debt defaults. These categories reflect that financial institution failure, financial market failure, and sovereign debt failure could have systemic consequences.

i. Financial Safety Nets for Banks and Other Financial Institutions

Financial safety nets can help protect troubled banks and other financial institutions from default and eventual collapse. In response to bank runs in the Great Depression, the U.S. Congress enacted section 13(3) of the Federal Reserve Act, empowering the Federal Reserve System (Fed) to act as a lender of last resort in "unusual and exigent circumstances" to banks and other financial institutions. Central banks of other nations have similar missions.[18]

The primary concern with these types of safety nets is that anticipation of a bailout will encourage financial institutions to engage in morally hazardous (i.e., fiscally reckless) behavior. Constructive ambiguity—bailing out some institutions but not others, to reduce reliance on bailouts—can mitigate moral hazard; but it can also lead to potential mistakes, such as not bailing out Lehman Brothers.

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18 Although the mission of the European Central Bank (ECB) is to stabilize the price of the European currency, in "exceptional circumstances" the ECB may indemnify national central banks for "specific losses arising from monetary policy operations" taken for the benefit of the central banking system. Protocol on the Statute of the European System of Central Banks and of the European Central Bank art. 32.4, Dec. 16, 2004, 2004 O.J. (C 310) 225, 239. *See also* Duncan Alford, *The Lamfalussy Process and EU Bank Regulation: Another Step on the Road to Pan-European Regulation?*, 25 ANN. REV. BANKING & FIN. L. 389, 392 (2006) ("National governments or related agencies, such as central banks, typically have lender-of-last-resort responsibility for banks operating within their borders."); Steve H. Hanke, *Currency Boards*, 579 ANNALS AM. ACAD. POL. & SOC. SCI. 87, 90 tbl. 2 (2002) (observing that a typical central bank functions, among other things, as a lender of last resort).

Although the tension between financial safety nets and moral hazard may well be unavoidable, the likelihood that financial institutions will engage in morally hazardous behavior may be overestimated. Financial institutions can be liquidated, so an institution that engages in morally hazardous behavior is playing a very dangerous game. Indeed, there is no solid evidence, even in the global recession, that financial institutions have been engaging in that type of behavior.

Lack of evidence aside, because the Fed used section 13(3) to bail out huge financial institutions, like AIG, through (at least initial) taxpayer expense, politicians reacted in the Dodd-Frank Act by limiting that safety net.[19] I have serious doubts whether legislative pre-set limits on a financial safety net should ever replace the judgment of a government agency—especially one as independent as the Fed—to decide, in actual context, whether to extend the safety net.[20]

ii. Financial Safety Nets for Markets

We need to more seriously consider extending safety-net mechanisms to financial markets, *qua markets*. The global recession has demonstrated that panic-driven market pricing failures—exacerbated by such factors as marking-to-market and concerns over counterparty-risk—can have systemic consequences. Experience in that recession supports establishment of *market* liquidity providers of last resort to stabilize market prices.

For example, in response to the collapse of the commercial paper market, the Fed 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. The CPFF apparently helped to stabilize the commercial paper market, without fostering moral hazard.[21]

Highly publicized recent governmental purchases of market securities only indirectly constitute safety-net mechanisms for

19 The Dodd-Frank Act limits, among other things, bailouts of individual financial institutions.

20 *Cf.* DAVID SKEEL, THE NEW FINANCIAL DEAL 136–37 (2011) (arguing that the "incentives created by [the Dodd-Frank Act's limitations on the section 13(3) safety-net] are not encouraging").

21 Tobias Adrian, Karin Kimbrough & Dina Marchioni, *The Federal Reserve's Commercial Paper Funding Facility*, FED. RES. BANK N.Y. ECON. POL'Y REV. (forthcoming 2011) (manuscript at 10–12). *See also* Steven L. Schwarcz, *Too Big to Fail?: Recasting the Financial Safety Net*, *in* THE PANIC OF 2008, at 94, 100 (Lawrence E. Mitchell & Arthur E. Wilmarth, Jr. eds., 2010) [hereinafter Schwarcz, *Too Big to Fail?*].

financial markets. For example, European Central Bank purchases of Greek, Irish, and Portuguese bonds[22] are intended to stabilize those nations, not the sovereign bond markets per se; and the Fed's purchases of U.S. Treasury securities (so-called "quantitative easing") are intended to stimulate the economy, not the market for U.S. Treasuries per se. We need to more seriously consider how safety-net mechanisms for financial markets, *qua markets*, can control panic-driven pricing failures that can lead to systemic collapses.[23]

iii. Financial Safety Nets for Sovereign Nations

Even a default by relatively small nations, like Greece, Ireland, and Portugal, can have global repercussions. Financial safety nets therefore should be considered for sovereign nation debt.

Traditionally, the International Monetary Fund (IMF) provides this safety net. But the IMF safety net raises various concerns, including: (1) the potential for moral hazard; (2) the inefficient use of IMF-member-nation (and thus ultimately taxpayer) funds[24]; and (3) the possibility of imposing politically motivated, sometimes harmful, "conditionality" on nations that otherwise would benefit from the safety net.

The IMF safety net could also be viewed as insufficient or even unreliable when a sovereign debt default is likely to cause disproportionately greater regional than international harm. For this reason, observers are increasingly focusing on the possibility of establishing regional safety nets for sovereign nations. In December 2010, for example, I participated in a high-level meeting in Oxford to examine how to create a regional safety net for Euro-zone nations.[25] And not too dissimilarly, there has been increasing concern that some states in the United States, which have many sovereign attributes, may need financial protection from default.

Conceptually, regional safety nets should be no different from global safety nets, except insofar as who provides the

22 *See infra* note 25.

23 For initial analysis of safety-net mechanisms for financial markets, see generally Schwarcz, *Too Big to Fail?*, *supra* note 21, and Anabtawi & Schwarcz, *supra* note 5, (manuscript at 55–58).

24 *See, e.g.*, Steven L. Schwarcz, *Sovereign Debt Restructuring: A Bankruptcy Reorganization Approach*, 85 CORNELL L. REV. 956, 963–66 (2000) [hereinafter Schwarcz, *Sovereign Debt Restructuring*] (demonstrating the cost to taxpayers of IMF member-nation contributions).

25 To some extent, regional safety nets are being spun on an ad hoc basis for sovereign-nation debt, such as through European Central Bank purchases of Greek, Irish, and Portuguese bonds. But that is in a highly politically visible and debt-specific context.

funding.[26] For a regional safety net, the funders are—like the recent European Union response to the debt problems of Greece, Ireland, and Portugal—primarily regional confederations and their member nations.

A conceptual analysis of financial safety nets for sovereign nation debt therefore need not focus, at least in the first instance, on whether the safety net should be regional or international. The fundamental problems are the same for both.

The main problem is that a nation that anticipates being bailed out is likely to engage in morally hazardous behavior. Nations are much more likely than financial institutions to engage in this behavior because nations, unlike firms, cannot be liquidated, and also because governments have strong political incentives (sometimes augmented by popular uprisings, such as the riots in Athens) to avoid reducing services or raising taxes.[27] Another problem with financial safety nets for nations is that bailouts are terribly expensive—in the case of Greece, for example, costing potentially hundreds of billions of euros.

These are growing problems: as global capital markets increasingly (and inevitably) embrace sovereign bonds as a financing tool, a country's debt becomes more tightly linked to the rest of the financial system, making a default more likely to trigger a systemic collapse.

The alternative to a bailout is an orderly debt restructuring, but that is usually impractical for nations because of two market imperfections: a holdout problem and a funding problem.[28] The holdout problem is that any given creditor has an incentive to strategically hold out from agreeing to a reasonable debt-restructuring plan, hoping that the imperative of others to settle will persuade them to allocate the holdout more than its fair share of the settlement or purchase the holdout's claim.

The funding problem is that a country is likely to need to borrow new money to pay critical expenses during the debt

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26 At a December 8, 2010 meeting at the University of Oxford, Dr. Domenico Lombardi, President of The Oxford Institute for Economic Policy, discussed favorably a proposal by Daniel Gros and Thomas Mayer for a European monetary fund. *See* Daniel Gros & Thomas Mayer, *How to Deal with Sovereign Default in Europe: Create the European Monetary Fund Now!*, CENTRE FOR EUR. POL'Y STUD., POL'Y BRIEF, May 17, 2010, at 1, 2. I argued that proposal is nothing more than what scholars have proposed for years in a broader context.

27 The Greek government, for example, did little to impose fiscal austerity even as debts accumulated.

28 *See generally* Steven L. Schwarcz, *Facing the Debt Challenge of Countries That Are Too Big to Fail*, *in* SOVEREIGN DEBT: FROM SAFETY TO DEFAULT (Robert W. Kolb ed.) (forthcoming 2011) (manuscript at 2–3), *available at* http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=2950&context=faculty_scholarship.

restructuring process, but no lender is likely to be willing to lend such funds unless its right to repayment has priority over existing debt claims.

Any effective solution to the sovereign debt dilemma would have to address both the holdout problem and the funding problem. Given the importance and high media visibility of country debt problems, let me digress a few minutes to examine *how* these problems could be addressed.

Addressing the Holdout Problem. The holdout problem can be addressed by legislating, through international treaty, a form of "super-majority" voting on sovereign debt-restructuring plans, in which a vote by the overwhelming majority of similarly situated creditors can bind dissenting creditors.[29] This is the tried-and-true method by which insolvency law, including Chapter 11 of the U.S. Bankruptcy Code, successfully and equitably addresses the holdout problem in a corporate context and achieves consensual debt restructuring. Because only similarly situated creditors can vote to bind dissenting creditors, and because any outcome of voting will bind all those creditors alike, the outcomes of votes should benefit the claims of holdouts and dissenters as much as the claims of the super-majority.

The IMF actually proposed, some years back, a sovereign debt restructuring mechanism (SDRM) similar to this, based on scholarly research of the problem (including my own research).[30] It was never adopted, however, because of political opposition in the United States by officials in the second Bush Administration, apparently based on philosophical dogma that free-market solutions always ought to trump legislative ones. They instead favored solving the holdout problem contractually, through what are referred to as collective-action clauses, allowing essential payment terms of a loan facility to be changed through super-majority, as opposed to unanimous, voting.

There are, however, two fundamental problems with collective-action clauses. First, collective-action clauses are not always included in sovereign loan and bond agreements. In the Greek debt crisis, for example, ninety percent of the total debt was *not* governed by collective-action clauses. Second, even if every sovereign loan and bond agreement included collective-action clauses, those clauses only work on an agreement-by-agreement basis. Therefore, any one or more syndicate(s) of banks or group of bondholders that fails to achieve a super-

29 *Id.* at (manuscript at 3).

30 Schwarcz, *Sovereign Debt Restructuring*, *supra* note 24, at 956–57.

majority vote would itself be a holdout vis-à-vis other creditors. It thus is unlikely that collective-action clauses can ever effectively resolve the holdout problem in sovereign-debt restructuring.[31]

I therefore believe that an international convention, in which super-majority voting can bind all of a debtor-nation's creditors, is needed to solve the holdout problem.

Addressing the Funding Problem. Such a convention could also address the funding problem. A simple remedy would be to grant a first priority right of repayment to loans of new money made to enable a country to pay critical expenses during the debt restructuring process. Existing creditors can be protected by giving them the right to object to a new-money loan if its amount is too high or its terms—including conditionality deemed appropriate by the lenders—are inappropriate. (Conditionality will therefore be negotiated.) Existing creditors will also be further protected because a country that abuses new-money lending privileges will be unlikely to receive super-majority creditor approval for a debt-restructuring plan.

B. Resolution Mechanisms

Another way to limit the systemic consequences of financial failures is through resolution mechanisms that diminish the impact of the failure. An example of such a resolution mechanism would be a pre-set plan to liquidate an entity or re-arrange its capital structure upon the occurrence of stated events, like insolvency.

Resolution mechanisms are most applicable to financial institutions. They have no direct application to markets. And they have relatively little application to sovereign nations, because sovereign nations cannot politically—and arguably should not morally—be liquidated.

Resolution mechanisms have long been used for non-financial institutions. In that context, these mechanisms are usually called 'bankruptcy' or 'insolvency' laws, and they generally provide legal guidelines for liquidating companies or enabling companies to reorganize when, at least in theory, reorganization would be more efficient than liquidation. (Although I have long argued for a "bankruptcy reorganization" approach to sovereign debt restructuring,[32] I described the core of

31 *Id.* at 960–61.

32 *See supra* notes 24 and 28.

that approach when discussing financial safety nets for sovereign nations).

There is controversy, though, whether bankruptcy-type resolution mechanisms are appropriate for financial institutions, especially when such institutions (like Lehman Brothers) are multinational. This controversy is not surprising; even in the context of domestic bankruptcy for non-financial firms, there is controversy over what should be the fundamental goals.[33]

There are also unanswered questions about incentives to implement bankruptcy-type resolution of financial institutions, especially when the sole resolution option—as under the Dodd-Frank Act—is liquidation. Will regulators, politically, be prepared to pull the trigger? If they do, could that cause larger systemic consequences, as did Lehman Brothers' bankruptcy?[34]

CONCLUSION

Ex ante financial regulation is inherently limited. Regulation cannot anticipate or control every source of financial failure. Ex post regulation is therefore needed to help break the transmission of financial failures and to limit their systemic consequences.

My goal today has not been to identify and critique all possible ex post financial regulatory approaches. Nor has it been to systematically compare ex ante and ex post regulatory approaches.[35] Rather, I have attempted to contrast fundamental differences between the two, as well as to illustrate how ex post approaches can—and arguably should—supplement ex ante approaches as part of a comprehensive financial regulatory framework.[36]

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33 *See, e.g.*, Douglas G. Baird, *Bankruptcy's Uncontested Axioms*, 108 YALE L.J. 573, 576–77 (1998).

34 *Cf.* Judge, *supra* note 10, at 83 (explaining why determining when to intervene can be a "real challenge" for regulators).

35 *Cf.* Schwarcz, *Systemic Risk*, *supra* note 3, at 214–34 (identifying and comparing potential ex ante preventative and ex post reactive approaches to regulating systemic risk).

36 *Cf.* John Armour, *Bank* Resolution Regimes: Designing the Right Model? (Aug. 3, 2010) (unpublished working paper) (on file with author) ("Resolution mechanisms must be seen as just one part of a larger regulatory toolkit, which contains a mix of *ex ante* measures as well as *ex post* resolution tools.").