

RISKY BUSINESS: THE CREDIT CRISIS AND FAILURE (PART I)

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INTRODUCTION

The credit crisis represents a watershed event for global financial markets and has been linked to significant declines in real economy performance on a level of magnitude not experienced since World War II.¹ Recognition of the crisis in 2008 has been followed in 2009 and 2010 by a plethora of competing proposals in response to the credit crisis.² The result has been a cacophony of visions, voices, and approaches. The sheer noise that has ensued threatens to drown out the fundamental core questions that should be asked about the credit crisis. Among the most important are questions about the relationships between risk, regulation, and failure.

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¹ See INTERNATIONAL MONETARY FUND, WORLD ECONOMIC OUTLOOK: CRISIS AND RECOVERY xii (2009), <http://www.imf.org/external/pubs/ft/weo/2009/01/pdf/text.pdf> (“[G]lobal activity is projected to contract by 1.3 percent in 2009[, which] represents the deepest post–World War II recession by far. . . . [T]he downturn is truly global: output per capita is projected to decline in countries representing three-quarters of the global economy.”).

² A wide range of proposals for financial services industry reform has arisen in the midst of the credit crisis, including two separate proposals from the Department of the Treasury under the Bush and Obama administrations and a number of legislative proposals. See, e.g., The Wall Street Transparency & Accountability Act of 2010, S. ____, 111th Cong. (2010) (bill number not yet assigned at time of publication) (link); Restoring American Financial Stability Act of 2010, S. 3217, 111th Cong. (2009) (link); Wall Street Reform and Consumer Protection Act of 2009, H.R. 4173, 111th Cong. (2009) (link); Private Fund Investment Advisers Registration Act of 2009, H.R. 3818, 111th Cong. (2009) (link); Private Fund Transparency Act of 2009, S. 1276, 111th Cong. (2009) (link); Hedge Fund Transparency Act of 2009, S. 344, 111th Cong. (2009) (link); Hedge Fund Adviser Registration Act of 2009, H.R. 711, 111th Cong. (2009) (link); Dep’t of Treasury, Blueprint for a Modernized Financial Regulatory Structure (2008) (hereinafter Treasury Blueprint) (link); DEP’T OF TREASURY, FINANCIAL REGULATORY REFORM—A NEW FOUNDATION: REBUILDING FINANCIAL SUPERVISION AND REGULATION (2009) (HEREINAFTER TREASURY 2009 REFORM PROPOSAL) (link).

The credit crisis can be viewed as a type of financial market network failure.³ The credit crisis underscores the complex and linked nature of contemporary financial markets, as well as the inherent difficulties regulators and industry participants face in managing complex and interconnected risks. The credit crisis also demonstrates that neither industry participants nor regulators fully apprehended underlying financial market risks. In recent years, financial products and financial markets have become increasingly complex and global.⁴ Although public commentary and policy discussions in the credit crisis aftermath focused on the implications of financial services firms that are “too big to fail,”⁵ existing commentary devotes less attention to the network-like characteristics of financial markets and the implications of complex networks for financial markets.⁶ The impact of financial market networks is heightened by the pervasive cultures of trading and risk-taking that now characterize many market segments.⁷ The risk-taking associated with financial market trading activities is perhaps best illustrated by cases of individual traders who took on risky trading positions that significantly compromised or, in the case of Baring Brothers, destroyed the firms on whose account they trade.⁸

Over-the-counter (OTC) derivatives illustrate both financial innovation and the links that connect financial market participants, such as traders. Derivatives have been a key aspect of financial innovation;⁹ they have

³ See Olufunmilayo B. Arewa, *Financial Markets and Networks—Implications for Financial Market Regulation*, 78 U. CIN. L. REV. (forthcoming 2010) (on file with author).

⁴ See, e.g., COUNTERPARTY RISK MGMT. POLICY GROUP III (CRMPG III), CONTAINING SYSTEMIC RISK: THE ROAD TO REFORM 4 (2008) (noting that for structural, technological, and behavioral reasons “contemporary finance has become incredibly complex”) (link); Olufunmilayo B. Arewa, *Trading Places: Securities Regulation, Market Crisis, and Network Risk* 7 (Nw. Univ. Sch. of Law Pub. Law & Legal Theory Series, Working Paper No. 09-01, 2009), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1324951 (discussing implications of the “complexity and pace of innovation in global financial markets”) [hereinafter Arewa, *Trading Places*] (link).

⁵ In January 2010, for example, President Obama proposed yet another Wall Street reform plan that would limit the size and activities of the kinds of institutions that in the past were considered “too big to fail.” Press Release, White House, Office of Press Sec’y, President Obama Calls for New Restrictions on Size and Scope of Fin. Insts. to Rein in Excesses and Protect Taxpayers (Jan. 21, 2010), <http://www.whitehouse.gov/the-press-office/president-obama-calls-new-restrictions-size-and-scope-financial-institutions-rein-e> (link).

⁶ Arewa, *Trading Places*, *supra* note 4, at 7, 18–23.

⁷ *Id.*

⁸ See Ian Greener, *Nick Leeson and the Collapse of Barings Bank: Socio-Technical Networks and the ‘Rogue Trader’*, 13 ORG. 421 (2006) (discussing Nick Leeson and how his unauthorized and risky trades led to the collapse of his employer Barings Brothers in 1995); see also Kimberly D. Krawiec, *The Return of the Rogue*, 51 ARIZ. L. REV. 127 (2009) (discussing instances of rogue traders and the losses such traders generated for their firms) (link).

⁹ Myron S. Scholes, *Derivatives in a Dynamic Environment*, 88 AM. ECON. REV. 350, 364 (1998) (noting that derivatives “have become essential mechanisms in the tool kit of financial innovation”).

“enabled a far greater degree of linkage across markets than at any other time.”¹⁰

Private legal rules, often specified in form documents, are typically incorporated into OTC derivatives contracts.¹¹ OTC derivatives are traded through private contracts between parties based on form agreements that permit customization for particular transactional terms. In contrast, exchange-traded derivatives, such as futures and options on futures, are traded and cleared through standardized contracts and bought and sold in organized derivatives exchanges.¹² OTC derivatives markets exemplify the complexity and trading in financial markets.¹³ OTC derivatives are now key building blocks in global financial markets, with a gross market value of \$25 trillion and notional value of \$605 trillion in June 2009.¹⁴

Not surprisingly, the character and complexity of financial markets were major factors in the industry and regulatory failures that preceded the credit crisis. In the aftermath of the credit crisis, however, failure is often discussed in connection with the financial services companies that many blame for the crisis. Although blame can and certainly should fall on professional financial market participants, other failures, including those by regulators, have also played a significant role in the credit crisis. Further, U.S. financial market regulation frameworks have not kept pace with financial innovation. As a result, regulators often are unable to provide adequate risk oversight for the complex trading and other activities that increasingly characterize financial markets.

¹⁰ MOHAMED EL-ERIAN, *WHEN MARKETS COLLIDE: INVESTMENT STRATEGIES FOR THE AGE OF GLOBAL ECONOMIC CHANGE* 141 (2008).

¹¹ Frank Partnoy, *ISDA, NASD, CFMA, and SDNY: The Four Horsemen of Derivatives Regulation?*, in *PAPERS ON FINANCIAL SERVICES* 213, 216 (Robert E. Litan & Richard Herring eds., Brookings-Wharton 2002) (link).

¹² Randall Dodd, *The Structure of OTC Derivatives Markets*, 9 *FINANCIER* 1–2 (2002) (link).

¹³ Garry J. Schinasi, R. Sean Craig, Burkhard Drees & Charles Kramer, *Modern Banking and OTC Derivatives Markets: The Transformation of Global Finance and its Implications for Systemic Risk* 3, 6 (Int’l Monetary Fund Occasional Paper 203, 2000) (noting that the dynamics of modern finance are much more complex than those of traditional banking deposit markets and that “[b]ecause each derivatives portfolio is composed of positions in a wide variety of markets, the network of credit exposures is inherently complex and difficult to manage”).

¹⁴ BANK FOR INT’L SETTLEMENTS (BIS), *BIS QUARTERLY REVIEW: INTERNATIONAL BANKING AND FINANCIAL MARKET DEVELOPMENTS* 22 (Dec. 2009), http://www.bis.org/publ/qtrpdf/r_qt0912.htm (link). Notional amounts reflect the principal value of the underlying assets on which the derivative is based, represent a measure of market size, and serve as a reference point for determining contractual payments. BIS, *OTC DERIVATIVES MARKET ACTIVITY IN THE FIRST HALF OF 2008* at 4 (Nov. 2008), http://www.bis.org/publ/otc_hy0811.pdf [hereinafter BIS, *OTC DERIVATIVES MARKET*] (link). Notional amounts, however, are not typically exchanged, U.S. GOV’T ACCOUNTABILITY OFFICE, *FINANCIAL DERIVATIVES—ACTIONS NEEDED TO PROTECT THE FINANCIAL SYSTEM* 28 n.7 (1994) (link), and do not represent a true measure of risk. Instead, the gross market value of derivatives, which measures the cost of replacing all existing contracts, is a better measure of market risk. BIS, *OTC DERIVATIVES MARKET* at 4–5.

Rhetorically bashing financial institutions has become commonplace among the media, public officials, regulatory agencies and the general public.¹⁵ A focus on blaming financial institutions, however, deflects attention from other failures that contributed to the credit crisis.¹⁶ Further, few discussions focus to a sufficient extent on dealing with the industry and regulatory failures that led to the credit crisis. The credit crisis aftermath could be seen as actually rewarding those most responsible for the failure to manage or regulate risky financial market business activities. Through programs such as the Troubled Asset Relief Program (TARP)¹⁷ and the Public-Private Investment Program (PPIP),¹⁸ which are government initiatives to address problems resulting from the presence of “illiquid and troubled assets on financial institutions’ balance sheets,”¹⁹ industry participants received government bailouts that permitted them to avoid assuming the full risk of their activities.²⁰ The bailouts have thus rewarded risk management failures by averting firm failure, which presents the same significant moral hazard implications that spawned the current financial crisis in the first place.²¹

¹⁵ David Reilly, *Banker Bashing Gives Cover to Far Bigger Culprits*, BLOOMBERG.COM, Feb. 6, 2009, http://www.bloomberg.com/apps/news?pid=20601039&refer=columnist_reilly&sid=akQHGe4jT8fs (Banker bashing “satisfies the populist need for an identifiable villain in the financial crisis[,] . . . provides an outlet for our collective anger[,] . . . [and] absolves us from thinking about just how we—the credit-card-loving, mortgage-craving, debt-addicted consumers of America—helped foment the meltdown.”) (link).

¹⁶ Anne-Sylvaine Chassany & Eric Schatzker, *Blackstone CEO Says Banker Bashing Risks Recovery (Update 3)*, BUSINESSWEEK.COM, Jan. 28, 2010, <http://www.businessweek.com/news/2010-01-28/blackstone-ceo-says-banker-bashing-risks-recovery-update3-.html> (link).

¹⁷ Emergency Economic Stabilization Act of 2008, Pub. L. 110-343, § 101, 122 Stat. 3765, 3767–3768 (2008) (authorizing the Secretary of the Treasury to establish TARP and describing TARP) (link); see also Lucian A. Bebchuk, *Buying Troubled Assets*, 26 YALE J. REG. 343 (2009) (describing Bush and Obama administration plans for dealing with the credit crisis that addressed problems related to illiquid bank troubled assets); Randall D. Guynn, Annette L. Nazareth & Margaret E. Tahyar, *Emergency Economic Stabilization Act: The Original Vision*, in DAVIS POLK FIN. CRISIS MANUAL 41–58 (2009) (describing the original understanding of the bill authorizing the creation of TARP).

¹⁸ John L. Douglas, Yukako Kawata, Margaret E. Tahyar & Danforth Townley, *The Public-Private Investment Program*, in DAVIS POLK FIN. CRISIS MANUAL 181–206 (2009) (describing PPIP) (link); see also Bebchuk, *supra* note 17 (describing Bush and Obama administration plans for dealing with the credit crisis that addressed problems related to illiquid bank troubled assets).

¹⁹ Douglas et al., *supra* note 18, at 181.

²⁰ See Jonathan Macey, *Obama and the ‘Fat Cat Bankers’*, WSJ.COM, Jan. 12, 2010, <http://online.wsj.com/article/SB10001424052748704081704574652622742100550.html> (“But we must get out of the business of guaranteeing against failure. The bankers and the shareholders who enjoy the rewards of risk-taking should be made to act like real capitalists: They should be required to assume the risks that go along with the banks’ business activities.”) (link).

²¹ See Karl S. Okamoto, *After the Bailout: Regulating Systemic Moral Hazard*, 57 UCLA L. REV. 183 (2009) (attributing the credit crisis to systemic moral hazards in risk-taking) (link).

Bailouts reflect recognition of the networked nature of financial markets today and the potential systemic impact of firm failures.²² Because failure is an important market mechanism, however, preventing failed firms from actually failing serves to obscure the fact that failure may be both necessary and desirable.²³ Further, although deregulation played a role in the credit crisis, lax regulation and regulatory failure also contributed to the credit crisis.²⁴ As is the case with failed industry participants, regulators may also be rewarded for their failures by being given greater regulatory responsibility.²⁵ Financial market reform proposals would benefit from taking better account of the implications of the widespread failures of varied market participants and regulators and focusing to a greater extent on regulatory effectiveness as both a goal and a metric by which to measure regulatory success.

This Essay analyzes the institutional and legal implications of cultures of trading. It discusses the implications of cultures of trading and considers regulatory reforms that such cultures of trading make necessary. This Essay also recommends adoption of regulatory approaches that focus on prevention of future failures rather than approaches geared toward preventing past failures. An approach that intends to avert future failures should include a number of elements designed to ameliorate risk. A key element in such an approach would entail development of mechanisms that force market participants to bear the risks of their activities. Potential approaches could involve varied means, such as insurance, industry bailout pools, and improved industry risk management. These internal industry regulatory initiatives should be part of an overall regulatory approach that focuses on developing financial market firewalls to contain the impact of participant failures. Averting future major financial market failures will also require fundamentally rethinking U.S. regulatory approaches and implementing regulatory principles that guide regulatory enactment and reform. These regulatory principles should focus on creating financial market regulatory

²² See generally Olufunmilayo B. Arewa, *Financial Firewalls: The Credit Crisis and Network Contagion*, 4 ENTREPRENEURIAL BUS. L.J. 305, 321 (2010) (noting the interconnectedness of financial firms in today's financial markets).

²³ Alex J. Pollock, *Is a 'Systemic Risk Regulator' Possible?*, AMERICAN.COM, May 12, 2009, <http://www.american.com/archive/2009/may-2009/is-a-2018systemic-risk-regulator2019-possible> (“[T]he failure of individual firms is not only necessary, but in the systemic sense, desirable.”) (link).

²⁴ Patricia A. McCoy, Andrey D. Pavlov & Susan M. Wachter, *Systemic Risk Through Securitization: The Result of Deregulation and Regulatory Failure*, 41 CONN. L. REV. 1327 (2009) (detailing the chronology of deregulation and subsequent failure to enforce existing regulations that led to the credit crisis) (link); *id.* at 1366 (“In sum, deregulation and federal regulators’ subsequent failure to exercise their traditional oversight powers laid the foundation for the underpricing of risk and the erosion in lending standards.”).

²⁵ Edward L. Glaeser, *A Failure of Regulation, Not Capitalism*, N.Y. TIMES ECONOMIX BLOG, June 9, 2009, 06:00 EST, <http://economix.blogs.nytimes.com/2009/06/09/a-failure-of-regulation-not-capitalism/> (“But it is foolish to react to a governmental failure and think that the right response is to vastly increase the scope of public activity.”) (link).

frameworks that are efficient, effective, flexible, transparent and neutral. Ensuring better education of market participants, regulators, and most importantly investors, should also be a core goal of financial market regulation. Finally, the global and complex nature of financial markets requires regulation based to the greatest extent possible on actual market dynamics, which entails better collection and analysis of relevant data that can then be used by participants and regulators to avoid future financial market meltdowns.

I. INDUSTRY RISK MANAGEMENT FAILURES

A. *The Credit Crisis and Downside Risks of Financial Market Innovation*

In the second half of 2008, credit markets became increasingly illiquid, with the U.S. emerging as the epicenter of a global financial contagion that was precipitated by the unraveling of U.S. housing markets.²⁶ Financial institutions throughout the world had exposure to U.S. housing markets,²⁷ in part through credit derivatives such as collateralized debt obligations (CDOs).²⁸ Other market participants, including monoline bond insurers and insurance companies such as American International Group, Inc. (AIG), retained significant exposure to CDOs by virtue of another type of credit derivative, credit default swaps (CDSs).²⁹ Companies used CDSs to insure payment streams for CDOs and other financial instruments.³⁰ Securitization has contributed to trends in general financial markets towards cultures of trading by enabling transformation of assets that were previously not traded and remained on individual companies' balance sheets into financial instruments with, in many cases, liquid trading markets.³¹

²⁶ SCOTT PATTERSON, *THE QUANTS: HOW A NEW BREED OF MATH WHIZZES CONQUERED WALL STREET AND NEARLY DESTROYED IT* 158–60 (2010); ROBERT J. SHILLER, *THE SUBPRIME SOLUTION: HOW TODAY'S GLOBAL FINANCIAL CRISIS HAPPENED, AND WHAT TO DO ABOUT IT* 101 (2008).

²⁷ JOAO GARCIA & SERGE GOOSSENS, *THE ART OF CREDIT DERIVATIVES: DEMYSTIFYING THE BLACK SWAN* 183 (2010) (“the credit crunch was ignited by the subprime mortgage-backed securities in the portfolios of financial institutions”).

²⁸ See generally Frank Partnoy & David A. Skeel, Jr., *The Promise and Perils of Credit Derivatives*, 75 U. CIN. L. REV. 1019, 1020–21 (2007) (describing credit derivatives and CDOs and noting their “increasingly important and controversial” role in financial markets).

²⁹ Arvind Rajan, *A Primer on Credit Default Swaps*, in *THE STRUCTURED CREDIT HANDBOOK* 17, 17 (Arvind Rajan, Glen McDermott & Ratul Roy eds., 2007) (“A credit default swap . . . is a contract in which the buyer of default protection pays a fee, typically quarterly or semiannually, to the seller of default protection on a reference entity, in exchange for a payment in case of a defined credit event such as a default.”) (footnote omitted) (link).

³⁰ See James Surowiecki, *Bonds Unbound*, NEWYORKER.COM, Feb. 11, 2008, http://www.newyorker.com/talk/financial/2008/02/11/080211ta_talk_surowiecki (link); *infra Part II* notes 127–132 and accompanying text.

³¹ See Arewa, *Trading Places*, *supra* note 4, at 11–13.

By creating liquid secondary trading markets for assets such as home mortgages that in the past remained on individual financial institution balance sheets, credit derivatives have enabled the spread of credit risk to a broad range of investors throughout the world.³² Investors purchasing credit derivatives, including a wide range of global financial institutions, relied to a significant extent on existing relationships with financial institutions that structure, market, and sell such derivatives. These investors also relied on privately generated ratings issued by gatekeepers such as credit rating agencies, which play a crucial verification and certification function in fixed income markets. Many structured finance instruments were actually far riskier than their ratings might have suggested. As a result, flaws in credit rating agency assessments of structured finance instruments often are considered a principal underlying cause of the credit crisis.

As the credit crisis unfolded, uncertainty about the valuation of credit derivatives and other assets on financial institutions' balance sheets contributed to a liquidity crunch that exacerbated the impact of the crisis.³³ This liquidity crunch significantly constrained secondary markets for structured finance securities in ways that many market participants and regulators failed to anticipate.

The credit crisis highlights pervasive failures in industry and regulatory risk management. Information and communications technologies, finance theory, and financial engineering facilitated development of derivatives markets³⁴ and played a role in the risk management of complex financial instruments.³⁵ However, rather than spreading risk prior to the credit crisis, financial market innovations tended to hide risk by complicating it.³⁶ The seeming ability to quantify and price risk underscores a conceptual shift in attitudes about risk, which may have contributed to the credit crisis.³⁷ The rise of so-called "quants" on Wall Street led to the era of complex financial products, complex trading strategies and automated trading, and intricate fi-

³² GARCIA & GOOSSENS, *supra* note 27, at 183 (discussing the systemic risk implications of investors' substituting a single name bond for a securitization note, which substitutes idiosyncratic with systemic risk).

³³ See Donald MacKenzie, *End-of-the-World Trade*, 30 LONDON REV. BOOKS 24, 24–26 (2008), available at <http://www.lrb.co.uk/v30/n09/donald-mackenzie/end-of-the-world-trade> (describing the loss of reliable facts to form the basis for trades and its exacerbation of the credit crisis) (link).

³⁴ PATTERSON, *supra* note 26, at 140, 166, 204.

³⁵ See, e.g., Bill Maurer, *Repressed Futures: Financial Derivatives' Theological Unconscious*, 31 ECON. & SOC'Y 15, 21 (2002) (noting that Black Scholes "fostered a tremendous expansion in the options market, because it seemed to allow a sure method for options pricing and an investment strategy based on using options to hedge against risk"); Stephen M. Schaefer, *Robert Merton, Myron Scholes and the Development of Derivative Pricing*, 100 SCAND. J. ECON. 425, 425–26, 441–443 (1998) (noting the impact of the Black-Scholes model on the development of the financial services industry).

³⁶ MICHAEL LEWIS, *THE BIG SHORT: INSIDE THE DOOMSDAY MACHINE* 74 (2010).

³⁷ See Donald MacKenzie & Yuval Millo, *Constructing a Market, Performing Theory: The Historical Sociology of a Financial Derivatives Exchange*, 109 AM. J. SOC. 107, 136 (2003) (discussing the "mathematicized risk-evaluation culture of the contemporary world").

financial market networks that characterized financial markets at the time of the credit crisis.³⁸

The activities of quants are exemplified by the rise and fall of Long-Term Capital Management (LTCM), a hedge fund that nearly failed in 1998.³⁹ LTCM opened for business in February 1994 after raising \$1.25 billion from a broad range of investors.⁴⁰ LTCM, whose principals included prominent traders and two Nobel Prize winners,⁴¹ employed a dozen or so trading strategies, some of which involved convergence trades and dynamic hedging.⁴² LTCM's trades involved complex strategies and trades that numbered in the thousands.⁴³ At one point, LTCM was reported to have over 60,000 trades on its books.⁴⁴ LTCM's reputation enabled it to get credit on easy terms and facilitated its development of connections with other traders and financial institutions, many of whom were eager to make trades with LTCM.⁴⁵

LTCM's Treasury arbitrage trade was one of its simpler trading strategies.⁴⁶ This trade, in one instance, took advantage of market discounting of thirty-year U.S. Treasury bonds, which created an unexpectedly wide spread in yields.⁴⁷ In 1994, betting that this spread would narrow, LTCM bought \$1 billion in bonds that its models suggested were undervalued by the market (the cheaper Treasury bonds), and sold short \$1 billion in bonds that its models suggested were overvalued by the market (the more expen-

³⁸ See generally PATTERSON, *supra* note 26, at 87, 93, 99, 106, 114, 115, 128, 138, 151, 155, 194.

³⁹ PRESIDENT'S WORKING GROUP ON FIN. MKTS., HEDGE FUNDS, LEVERAGE, AND THE LESSONS OF LONG-TERM CAPITAL MANAGEMENT 12–14 (Apr. 1999) [hereinafter PWG] (describing LTCM's near failure) (link).

⁴⁰ ROGER LOWENSTEIN, WHEN GENIUS FAILED: THE RISE AND FALL OF LONG-TERM CAPITAL MANAGEMENT 39 (2000).

⁴¹ *Id.* at 116–17 (noting that 1997 Nobel Laureate in Economics winners Robert C. Merton and Myron Scholes were among the principals at LTCM); PWG, *supra* note 39, at 10 (“LTCM's principals included individuals with substantial reputations in the financial markets and especially in the economic theory of financial markets.”).

⁴² See generally EDWARD CHANCELLOR, DEVIL TAKE THE HINDMOST: A HISTORY OF FINANCIAL SPECULATION 339 (2000) (noting that convergence trading is “a backward-looking type of speculation based on an extrapolation of historic price patterns”); PWG, *supra* note 39, at 10 & nn.13, 14 (noting that “LTCM sought to profit from a variety of trading strategies, including convergence trades and dynamic hedging,” and describing convergence trading (relative value arbitrage) as “the practice of taking offsetting positions in two related securities in the hopes that the price gap between the two securities will move in a favorable direction” and dynamic hedging as “the practice of managing nonlinear price risk exposure (*i.e.*, from options) through active rebalancing of underlying positions, rather than by arranging offsetting hedges directly”).

⁴³ PWG, *supra* note 39, at 46.

⁴⁴ *Id.* at 11.

⁴⁵ LOWENSTEIN, *supra* note 40, at 46–47.

⁴⁶ *Id.* at 45.

⁴⁷ *Id.* at 43 (“In 1994, Long-Term noticed that this spread was unusually wide. The February 1993 issue was trading at a yield of 7.36 percent. The bond issued six months later, in August, was yielding only 7.24 percent, or 12 *basis points*, less.”).

sive Treasury bonds).⁴⁸ To pay for the cheaper bonds, LTCM borrowed money from several Wall Street banks and borrowed the more expensive bonds that it sold short.⁴⁹ LTCM also loaned the bonds that it bought to other Wall Street firms, who wired cash to LTCM as collateral for the loaned bonds.⁵⁰ This series of transactions enabled LTCM to make the \$2 billion Treasury arbitrage trades without using any of its own cash. Maintaining the trade would cost LTCM a few basis points per month if rates moved as contemplated by LTCM, but could potentially cost far more if rates moved in an unanticipated manner.⁵¹

The Federal Reserve Bank of New York orchestrated the rescue of LTCM by a private bailout and recapitalization in the aftermath of bond market volatility surrounding the 1998 Russian debt default, due to fears about the potential market impact of an LTCM collapse.⁵² A clear harbinger of the later credit crisis, LTCM had leverage of greater than 100-to-1 just prior to its almost \$4 billion bailout.⁵³ Internal risk management models at LTCM were insufficient in the face of adverse market conditions in 1998. With more capital, however, LTCM might have withstood the adverse market conditions.

As was the case with LTCM in 1998, internal risk management at many financial market firms was not well-positioned to cope with the market volatility that came with the credit crisis.⁵⁴ The ability of many firms to

⁴⁸ *Id.* at 44; RICHARD A. BREALEY, STEWART C. MYERS & FRANKLIN ALLEN, *PRINCIPLES OF CORPORATE FINANCE* 369 (9th ed. 2008) (noting that a person selling short holds the view that a stock price will decline). Short selling is typically accomplished as follows: the person selling short borrows shares from an investor, sells the shares, waits for the price to decline so that the stock can be repurchased at a price lower than the original sale price, and returns the borrowed shares to the initial lending investor.

⁴⁹ LOWENSTEIN, *supra* note 40, at 44–45.

⁵⁰ *Id.* at 45.

⁵¹ *Id.* (noting that LTCM also substantially reduced or refused to take haircuts or post collateral on the bonds it borrowed).

⁵² *See id.* at 207–208 (noting that new equity of \$3.6 billion was contributed in exchange for 90 percent equity in LTCM); PWG, *supra* note 39, at 12 (“The LTCM Fund’s size and leverage, as well as the trading strategies that it utilized, made it vulnerable to the extraordinary financial market conditions that emerged following Russia’s devaluation of the ruble and declaration of a debt moratorium on August 17 of last year. Russia’s actions sparked a ‘flight to quality’ in which investors avoided risk and sought out liquidity.”); Joseph G. Haubrich, *Some Lessons on the Rescue of Long-Term Capital Management* (Fed. Reserve Bank of Cleveland Discussion Paper No. 19, 2007) (describing the full history and details of LTCM’s rescue by the Federal Reserve Bank) (link).

⁵³ LOWENSTEIN, *supra* note 40, at 191.

⁵⁴ *See, e.g., CEO Pay and the Mortgage Crisis: Hearing Before the H. Comm. on Oversight and Government Reform*, 110th Cong. 166 (2008) (testimony of Charles Prince, former Chairman and CEO, Citigroup) (“Last fall, it became apparent that the risk models which Citigroup, the various rating agencies, and the rest of the financial community used to assess certain mortgage-backed securities were wrong.”); *see generally* James Surowiecki, *That Uncertain Feeling*, *NEWYORKER.COM*, Sept. 1, 2008, http://www.newyorker.com/talk/financial/2008/09/01/080901ta_talk_surowiecki (discussing market volatility in 2008, noting that “[p]recipitous falls in the market have frequently been followed immediately by sharp rallies, and vice versa.”) (link).

successfully endure such volatility has been hindered by a number of factors, including inadequate risk management, high leverage, and compensation structures that may have encouraged speculation and incentivized risky trading. Further, misuses of mathematical models also contributed to the credit crisis.⁵⁵ The Gaussian copula function, which was developed by David X. Li,⁵⁶ a Wall Street math wizard, was widely used by various financial market participants, gatekeepers, and regulators to model complex financial market risks.⁵⁷ Li, who has an M.A. in the actuarial sciences and a Ph.D. in statistics, reflects a typical trajectory in the “quant” era, during which Wall Street firms hired Ph.D.s in math and physics to create, price, and arbitrage increasingly complex securities.⁵⁸ The Li formula addresses the problem of modeling default correlation, which is an important factor in pricing complex securities and assessing risk.⁵⁹ The importance of modeling default correlation is obvious, for example, in the case of LTCM’s treatment of sovereign bonds. An investor who is investing in Russian and Mexican bonds needs to understand the extent to which a Russian default might be correlated with a Mexican default.⁶⁰ LTCM failed in part because its models, which were based on 100 years of historical data, assumed no correlation between a Russian and Mexican default.⁶¹ Contrary to LTCM’s models, in 1998 a Russian and Mexican default were correlated, and because both markets included many of the same investors, the Russian default led many investors to sell their Mexican bonds as they attempted to lower the risk levels in their portfolios.⁶² The Russian devaluation and default on certain borrowings ultimately contributed to the collapse of LTCM.⁶³

Li’s Gaussian copula model was innovative in that it allowed modeling of CDO default correlation without the need for historical CDO data.⁶⁴ In-

⁵⁵ See Felix Salmon, *Recipe for Disaster: The Formula That Killed Wall Street*, WIRED MAG., Feb. 23, 2009, http://www.wired.com/techbiz/it/magazine/17-03/wp_quant (link).

⁵⁶ See David X. Li, *On Default Correlation: A Copula Function*, 9 J. FIXED INCOME 43 (2000). Li’s formula can be formalized as follows: $\Pr[T_A < 1, T_B < 1] = \Phi_2(\Phi^{-1}(F_A(1)), \Phi^{-1}(F_B(1)), \rho)$. Salmon, *supra* note 55.

⁵⁷ Salmon, *supra* note 55.

⁵⁸ *Id.*; PATTERSON, *supra* note 26, at 2–13.

⁵⁹ Salmon, *supra* note 55.

⁶⁰ See Sam Jones, *The Formula that Felled Wall Street*, FINANCIALTIMES.COM, Apr. 24, 2009, <http://www.ft.com/cms/s/2/912d85e8-2d75-11de-9eba-00144feabdc0.html> (link).

⁶¹ *Id.*

⁶² *Id.*

⁶³ INT’L MONETARY FUND, WORLD ECONOMIC OUTLOOK AND INTERNATIONAL CAPITAL MARKETS: INTERIM ASSESSMENT 35–36 (1998), <http://www.imf.org/external/pubs/ft/weo/weo1298/pdf/file3.pdf> (noting that “the devaluation and unilateral debt restructuring by Russia sparked a period of turmoil in mature markets that is virtually without precedent in the absence of a major inflationary or economic shock”) (link); LOWENSTEIN, *supra* note 40, at 135–149.

⁶⁴ Salmon, *supra* note 55.

stead, Li's model used historic CDS spreads to model default correlation.⁶⁵ A CDS price increase thus would be reflected as an increase in default risk in Li's formula.⁶⁶ Li's formula and variants based on it were widely adopted by industry participants and credit rating agencies, were used to price billions of dollars of CDOs, and contributed to increases in CDO and CDS activity.⁶⁷ Reliance upon and widespread use of Li's formula contributed to the credit crisis in part because those making asset allocation decisions on Wall Street were not quants and did not really understand the formula's limitations and weaknesses.⁶⁸ Further, mathematical models that could render some measurable (even if incorrect) output also may have lent "credibility and false precision to the dismal reality of risk management."⁶⁹

Use of derivatives may also have changed the ways investment professionals frame risk. Wall Street firms that created CDOs and other complex derivatives may have lessened due diligence and risk assessment of their creations because they assumed that a liquid market would exist.⁷⁰ Risk assessments were shaped by incomplete market assumptions.⁷¹ Therefore, significant gaps existed in widely used industry risk management models,⁷² particularly with respect to liquidity risk, which was underpriced.⁷³ Gaps in risk models and risk management reflected an incomplete understanding of financial networks and the full implications of trading credit derivatives and other complex structured products.⁷⁴

⁶⁵ *Id.*

⁶⁶ *See id.*

⁶⁷ *See id.*

⁶⁸ *See id.* ("[T]he managers empowered to apply the brakes didn't [understand the arguments between various arms of the quant universe].")

⁶⁹ SATYAJIT DAS, *TRADERS, GUNS & MONEY: KNOWN AND UNKNOWN IN THE DAZZLING WORLD OF DERIVATIVES* 179 (2006).

⁷⁰ *See EL-ERIAN, supra* note 10, at 144.

⁷¹ *See id.* at 145.

⁷² *See Jones, supra* note 60; Salmon, *supra* note 55; Economist Intelligence Unit, *The Bigger Picture: Enterprise Risk Management in Financial Services Organisations* 5 (Sept. 2008), http://www.sas.com/resources/whitepaper/wp_5612.pdf (reporting that financial services professionals surveyed "believe that the losses stemming from the credit crisis were largely as a result of failures to address risk management issues") (link); *cf.* CRMPG III, *supra* note 4, at 10–12 (identifying more ideal risk monitoring protocols).

⁷³ SECS. EXCH. COMM'N, OFFICE OF INSPECTOR GEN., *SEC'S OVERSIGHT OF BEAR STEARNS AND RELATED ENTITIES: THE CONSOLIDATED SUPERVISED ENTITY PROGRAM*, REPORT NO. 446-A, at 7 (Sept. 25, 2008) [hereinafter, SEC INSPECTOR GENERAL REPORT A] (link); *A Personal View of the Crisis: Confessions of a Risk Manager*, *ECONOMIST*, Aug. 9, 2008, at 72 [hereinafter *Confessions*] ("Liquidity risk was in effect not priced well enough; the market always allowed for it, but at only very small margins prior to the credit crisis. . . . The gap in our risk management only opened up gradually over the years with the growth of traded credit products such as CDO tranches and other asset-backed securities. These sat uncomfortably between market and credit risk.") (link).

⁷⁴ *See Confessions, supra* note 73; *see also* Wilson Sy, *Credit Risk Models: Why They Failed in the Credit Crisis* 3 (Austl. Prudential Regulation Auth., Working Paper, 2008), <http://www.apra.gov.au/Policy/upload/Working-paper-Credit-risk-models-Why-the-failed-in-the-credit-crisis-July-2008.pdf> (noting that the credit crisis has exposed shortcomings of credit risk models) (link).

The speed of credit crisis contagion also took many by surprise.⁷⁵ Further, the credit crisis unfolded along with changes to accounting rules for derivatives that require fair value (i.e., mark-to-market) reporting in company financial statements, which likely increased financial statement volatility.⁷⁶ Financial statement volatility may result from fair value accounting because assets and liabilities may need to be reported based on some measure of market value rather than historical cost measures.⁷⁷

Derivatives are an important part of hedging activities and proprietary and client trading operations for a wide variety of market actors, particularly investment and commercial banks and hedge funds. On Wall Street, for example, “trading firms routinely borrow as much as 50 times the cash in their accounts to trade complex financial instruments such as derivatives.”⁷⁸ The extensive leverage used in derivatives trading, however, may magnify risk.⁷⁹ In the credit crisis, leverage was an important factor in financial institution instability because many financial institutions were engaged in high-risk trading activities, did not have sufficient capital to withstand a market decline, and found it difficult to raise additional capital due to liquidity constraints in a frozen credit market.⁸⁰

The Counterparty Risk Management Policy Group III (CRMPG) is a group of industry participants tasked with providing a private sector response to the credit crisis.⁸¹ The CRMPG has identified four forces that often are common denominators in financial contagion: credit concentrations, maturity mismatches, excessive leverage on balance sheets or embedded in individual classes of financial instruments, and the illusion of market liquid-

⁷⁵ CRMPG III, *supra* note 4, at 4 (noting that the patterns, speed, and reach of the credit crisis contagion are “different in degree, if not kind, from . . . earlier periods of financial instability”).

⁷⁶ See FIN. ACCOUNTING STANDARDS BOARD (FASB), STATEMENT OF FINANCIAL ACCOUNTING STANDARDS 157: FAIR VALUE MEASUREMENTS (Sept. 2006); FASB, STATEMENT OF FINANCIAL ACCOUNTING STANDARDS 133: ACCOUNTING FOR DERIVATIVE INSTRUMENTS AND HEDGING ACTIVITIES (June 1998); Press Release, Secs. Exch. Comm’n, Office of the Chief Accountant and FASB Staff, Clarifications of Fair Value Accounting (Sept. 30, 2008) (link); Ira Kawaller & John Ensminger, *The Fallout from FAS 133*, 23 REG. 22, 22 (2000) (link); Carrie Johnson, *SEC Loosens Accounting Rule Banks Blame for Crisis*, WASHINGTONPOST.COM, Sept. 30, 2008, <http://www.washingtonpost.com/wp-dyn/content/article/2008/09/30/AR2008093002298.html> (link).

⁷⁷ Guillaume Plantin, Haresh Sapra & Hyun Song Shin, *Fair Value Reporting Standards and Market Volatility*, in DERIVATIVES ACCOUNTING AND RISK MANAGEMENT: KEY CONCEPTS AND THE IMPACT OF IAS 39, at 145, 150–51 (Hyun Sing Shin ed., 2004) (noting that some financial statement volatility may reflect fundamentals that otherwise reflect economic reality, while some resulting volatility may be artificial and pernicious).

⁷⁸ Bryan Burrough, *Bringing Down Bear Stearns*, VANITYFAIR.COM, Aug. 2008, http://www.vanityfair.com/politics/features/2008/08/bear_stearns200808 (link).

⁷⁹ DAS, *supra* note 69, at 31–32 (“Derivatives give you more leverage than anything else.”).

⁸⁰ See Markus K. Brunnermeier, *Deciphering the Liquidity and Credit Crunch 2007–2008*, 23 J. ECON. PERSPECTIVES 77 (2009) (describing the liquidity squeeze that came with the credit crisis) (link); Robert J. Samuelson, *Wall Street’s Unraveling*, NEWSWEEK.COM, Sept. 17, 2008, <http://newsweek.com/id/159334> (link).

⁸¹ CRMPG III, *supra* note 4, at vii–x, 1.

ity.⁸² These factors all played a role in the credit crisis and contributed to its spread through the same networks that connected market participants during more favorable market conditions. The credit crisis thus illuminates important perils of networked financial markets and some downside risks of financial innovation.⁸³

B. Industry Inoculation: Financial Market Loss Prevention and Risk Spreading

Because many financial market firms were heavily leveraged with insufficient capital, the consequences of failed risk management did not remain internalized within these firms. Rather, the costs of failed risk management have been externalized and borne by the general public. As many commentators have noted, this suggests the need for additional regulation to internalize these externalities,⁸⁴ in part by imposing serious consequences for failure.

The Goldman Sachs “Abacus” transactions illustrate how trading activities may exacerbate systemic risk. On April 16, 2010, the SEC brought fraud charges against Goldman Sachs in connection with Abacus 2007-AC1 synthetic CDOs that Goldman marketed and structured.⁸⁵ In contrast to cash CDOs, which contain portfolios of assets, synthetic CDOs reference an underlying portfolio of CDSs that may relate to the same types of assets that might be included in a cash CDO.⁸⁶ Synthetic CDOs are far faster and easier to assemble than cash CDOs, and have contributed to growth in credit derivatives markets. Abacus 2007-AC1 was a \$2 billion notional value synthetic CDO that referenced a portfolio of Residential Mortgage Backed Securities (RMBS).⁸⁷ Investors in the Abacus synthetic CDO included ABN Amro, which was later acquired by a group of banks that included the Royal Bank of Scotland (RBS).⁸⁸ RBS ultimately paid Goldman more than \$840 million to terminate ABN Amro’s Abacus position and is now gov-

⁸² *Id.* at 6, 12.

⁸³ Gary Gorton, *The Subprime Panic*, 15 EUR. FIN. MGMT. 10, 39–46 (2009).

⁸⁴ *See, e.g.*, Glaeser, *supra* note 25 (“The current crisis has revealed as utter fiction the idea that banks can fail without imposing costs on the rest of us. Since bank failures impose costs on everyone else, the banking system needs more regulations to internalize those externalities.”).

⁸⁵ The SEC Charges Goldman Sachs with Fraud in Connection with the Structuring and Marketing of a Synthetic CDO, Litigation Release No. 21489 (April 16, 2010), *available at* <http://www.sec.gov/litigation/litreleases/2010/lr21489.htm> (link); Complaint, SEC v. Goldman Sachs & Co., Complaint, No. 10-3229 (S.D.N.Y. Apr. 15, 2010), <http://www.sec.gov/litigation/complaints/2010/comp21489.pdf> (link).

⁸⁶ *See* Arewa, *supra* note 4, at 11–12.

⁸⁷ Goldman Sachs, Abacus 2007-AC1 Presentation Slides, at Slide 11, Feb. 26, 2007 (describing the capital structure of the Abacus transaction), *available at* <http://www.businessinsider.com/check-out-the-66-page-presentation-on-goldmans-abacus-cdo-deal-2010-4#-1> (link).

⁸⁸ Complaint, SEC v. Goldman Sachs, *supra* note 85, at 18–19.

ernment-controlled.⁸⁹ Similarly, German bank IKB Deutsche Industriebank AG purchased \$150 million of Abacus synthetic CDOs in April 2007 and lost most of its investment within months of its purchase.⁹⁰ It nearly failed in 2007 before a rescue from its main shareholder, state-owned KfW Bankengruppe.⁹¹ Synthetic CDOs magnified risk because they enabled market participants to place bets on the residential housing market that were far larger than the original market itself. By the end of 2006, although only \$1.2 billion in subprime mortgages were outstanding, more than \$5 trillion in investments had been created based on risky subprime loans.⁹² AIG, which received over \$120 billion in bailouts from the U.S. government, insured \$6 billion in Goldman-arranged Abacus deals.⁹³ A number of Abacus investors, including AIG, IKB, and RBS, were recipients of government bailouts.⁹⁴ The systemic impact of these types of trading activities and the potential for negative societal externalities are significant concerns in the aftermath of the credit crisis.

Regulation and internal risk management should share the goal of containing negative externalities that may flow from trading and other financial market activities. In addition to regulatory changes, credit crisis policy responses should strongly encourage financial market participants to manage risk collectively through mechanisms such as insurance and industry bailout pools that may help to spread risks of financial market activities among market participants. Models from other arenas could provide a starting point for shaping financial market participants' efforts to develop mechanisms to prevent the externalization of their losses to broader society. Such models could be developed in conjunction with regulatory mechanisms intended to manage risk. Although implementing industry-sponsored models is likely to be complex and challenging, the potential avenue for ameliorat-

⁸⁹ *Id.* at 19; Andrea Catherwood & Robert Hutton, *U.K.'s Brown Has 'No Doubt' RBS Will Weigh Suing Goldman Sachs*, BUSINESSWEEK.COM, Apr. 19, 2010, <http://www.businessweek.com/news/2010-04-19/u-k-s-brown-has-no-doubt-rbs-will-weigh-suing-goldman-sachs.html> (link).

⁹⁰ Complaint, SEC v. Goldman Sachs, *supra* note 85, at 15–18.

⁹¹ Ivar Simensen, *Ten Days That Changed the Tune of IKB*, FT.COM, July 30, 2007, <http://www.ft.com/cms/s/0/d20c8e5a-3ec1-11dc-bfcf-0000779fd2ac.html>.

⁹² GREGORY ZUCKERMAN, *THE GREATEST TRADE EVER: THE BEHIND-THE-SCENES STORY OF HOW JOHN PAULSON DEFIED WALL STREET AND MADE FINANCIAL HISTORY* 176 (2009); *see also* Gretchen Morgenson & Louise Story, *Banks Bundled Bad Debt, Bet Against It and Won*, NYTIMES.COM, Dec. 23, 2009, http://www.nytimes.com/2009/12/24/business/24trading.html?_r=18&dbk (link).

⁹³ Serena Ng, *AIG Considering Potential Claims Against Goldman Sachs*, WSJ.COM, Apr. 19, 2010, <http://online.wsj.com/article/SB10001424052748704671904575195010771947900.html> (link).

⁹⁴ Tom Taulli, *Goldman Sachs: The Stupidist Trade Ever*, DAILYFINANCE.COM, Apr. 27, 2010, <http://www.dailyfinance.com/story/goldman-sachs-the-stupidist-trade-ever/19446762/> (“The losers in the Abacus trade, which included . . . IKB, ultimately required government bailouts[.]”) (link); Peter Cohan, *AIG vs. Goldman: Insurer May Match SEC's Fraud Suit Against Bank*, DAILYFINANCE.COM, Apr. 20, 2010, <http://www.dailyfinance.com/story/investing/aig-vs-goldman-insurer-may-match-secs-fraud-suit-against-bank/19446616/> (link); Jill Treanor, *Government Takes 68% Stake in Royal Bank of Scotland*, GUARDIAN.COM, <http://www.guardian.co.uk/business/2009/jan/19/rbs-second-bailout> (link).

ing the impact of future market crises that such models offer makes those efforts worthwhile. In addition to potentially mitigating systemic risk, or risks to the financial system as a whole,⁹⁵ these models could also force private market discipline by creating regulatory frameworks that permit even large or highly-networked market players to fail. This likely will provide better incentives for more comprehensive internal industry risk management.

Additional forms of market insurance might supplement existing financial market insurance programs available through the Federal Deposit Insurance Corporation (FDIC), which insures bank deposits, and the Securities Investor Protection Corporation (SIPC), which insures broker-dealer accounts.⁹⁶ In financial markets more generally, varied insurance mechanisms could be used to ameliorate risk in capital market contexts. Just as the availability of insurance for investors reflects regulatory concern for retail market participants, industry insurance schemes would reflect acknowledgment that even sophisticated market participants may need to insure against risks of the sort that led to the credit crisis. Large law firms in the United States offer a potential model for self-insurance, even though it is not likely to be completely transferable to the capital market context. The Attorneys' Liability Assurance Society (ALAS) was founded in 1979.⁹⁷ ALAS membership includes 236 firms and 60,000 lawyers in forty-five states and the District of Columbia, with total assets of over \$1.9 billion.⁹⁸ Membership in ALAS is subject to careful ALAS underwriting, which includes "on-site underwriting reviews and significant scrutiny" prior to acceptance.⁹⁹ ALAS also makes recommendations concerning law firm structure and procedures.¹⁰⁰

Insurance will not, by itself, solve potential problems related to risk, but could spread risk and supplement risk firewalls in the event of broad, systemic problems or network failure. Insurance mechanisms may help to implement the private market discipline that remains the core goal of U.S. financial market regulatory frameworks. Regulators thus could either en-

⁹⁵ See generally Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L.J. 193, 196 (2008) (describing "a great deal of confusion about what types of risk are truly 'systemic'—the term meaning '[o]f or pertaining to a system'—and what types of systemic risk should be regulated.") (link).

⁹⁶ See, e.g., GAO, SECURITIES INVESTOR PROTECTION: STEPS NEEDED TO BETTER DISCLOSE SIPC POLICIES TO INVESTORS 3 (2001) ("The Securities Investor Protection Act of 1970 (SIPA) created the Securities Investor Protection Corporation (SIPC) to provide certain protections against losses to customers from the failure of a securities firm.") (link); see also George J. Benston & George G. Kaufman, *FDICIA After Five Years*, 11 J. ECON. PERSPECTIVES 139 (1997) (describing generally the functions of the FDIC).

⁹⁷ ALAS Website, <http://www.alas.com/about.shtml> (last visited May 10, 2010) (link).

⁹⁸ *Id.*

⁹⁹ Standard & Poor's, RatingsDirect, Attorneys' Liability Assurance Society (Bermuda) Ltd. and Attorneys' Liability Assurance Society Inc. RRG 4 (May 19, 2009), <http://www.alas.com/sp.pdf> (link).

¹⁰⁰ SUSAN P. SHAPIRO, TANGLED LOYALTIES: CONFLICT OF INTEREST IN LEGAL PRACTICE 38 (2002).

courage or require use of more industry insurance mechanisms in financial markets.

Establishing clearinghouses similar to those in the commodities arena might be another avenue for monitoring and reducing risk. Clearinghouses have been suggested for CDS markets.¹⁰¹ Industry-sponsored bailout pools may be another industry-based mechanism for promoting the internalization of risk by financial market participants.¹⁰² Payments into the bailout fund could follow an agreed-upon formula that might reflect an incremental fee attached to certain types of financial market activities¹⁰³ or could involve compensation holdbacks from employee bonuses. Regulators could monitor the composition of any payouts from such private bailout funds. The goal of industry-sponsored bailouts would be to establish firewalls around troubled or failed participating financial institutions and to execute any necessary financial rescues using funds from financial market participants rather than the general public.¹⁰⁴ Further, schemes organized by financial services market participants that are subject to external regulatory oversight and monitoring are likely to be far more effective than direct external regulation, particularly with respect to management of complex risks.¹⁰⁵

C. Risky Business and Regulatory Mismatch: Internal Risk Management and Fragmented External Regulation

Risk management in financial markets may be hindered by the current design of U.S. financial market regulatory architecture. Indeed, in 2008 the U.S. Treasury Department characterized the structure of U.S. financial market regulation as “largely incompatible with [capital] market developments.”¹⁰⁶ The financial services industry has seen a significant convergence of the banking, securities, and insurance market segments in

¹⁰¹ See, e.g., Council on Foreign Relations, *Credit Default Swaps, Clearinghouses, and Exchanges* (Squam Lake Working Group on Fin. Reg. Paper No. 5, 2009), available at http://www.cfr.org/publication/19756/credit_default_swaps_clearinghouses_and_exchanges.html (link).

¹⁰² See Dale B. Thompson, *Why We Need a Superfund for Hedge Funds 2* (March 8, 2009) (unpublished manuscript, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1358349) (arguing for a “Superfund”, comprised of taxes on hedge funds, akin to the “Superfund” used in environmental regulation) (link).

¹⁰³ See, e.g., *id.* (“The magnitude of this [“Superfund”] tax would be determined by the amount of liquidity risk posed by the portfolio choices of the hedge fund.”) (footnotes omitted).

¹⁰⁴ See, e.g., *id.* (hypothesizing that the “Superfund” could be used to purchase distressed financial assets).

¹⁰⁵ Rafael La Porta, Florencio Lopez-De-Silanes & Andrei Shleifer, *What Works in Securities Laws?*, 61 J. FIN. 1, 27–28 (2006) (finding in empirical study that securities laws are most important in facilitating private contracting, and that common law securities laws more effectively spur such contracting, standardized disclosure, and private dispute resolution than public securities laws and their regulatory enforcers do).

¹⁰⁶ TREASURY BLUEPRINT, *supra* note 2, at 27.

recent years.¹⁰⁷ Unfortunately, regulatory architecture in the United States has not adapted to reflect changing industry configurations. Rather, U.S. regulatory architecture has remained complex and fragmented¹⁰⁸ in the face of industry “consolidation,” “conglomeration,” and “convergence.”¹⁰⁹

Regulatory fragmentation makes collaboration among various regulators difficult.¹¹⁰ In the futures and securities arena, for example, prior to the credit crisis, multiple regulatory authorities were responsible for regulating different aspects of financial markets. These authorities included the Securities and Exchange Commission (SEC), which had jurisdiction over securities, and the Commodity Futures Trading Commission (CFTC), which had jurisdiction over futures.¹¹¹ The SEC and the CFTC split regulatory jurisdiction over derivatives.¹¹² Over-the-counter (OTC) derivatives were largely unregulated due to the provisions of the Commodity Futures Modernization Act (CFMA).¹¹³ Regulatory treatment of OTC derivatives is, however, likely to change, and a number of post-credit crisis legislative and policy proposals would impose greater regulation on OTC derivatives markets.¹¹⁴

Although some market participants such as broker-dealers are more heavily regulated,¹¹⁵ other significant market actors, such as hedge funds, are typically structured to take advantage of regulatory exemptions, causing

¹⁰⁷ See, e.g., Cara S. Lown, Carol L. Osler, Philip E. Strahan & Amir Sufi, *The Changing Landscape of the Financial Services Industry: What Lies Ahead?*, 6 FED. RES. BANK N.Y. ECON. POL’Y REV. 39, 39–42 (2000) (describing the trend of consolidation in the U.S. banking industry and the expansion of banks into the securities and insurance businesses following deregulation in the United States) (link).

¹⁰⁸ See COMM. ON CAPITAL MKTS. REGULATION, THE GLOBAL FINANCIAL CRISIS: A PLAN FOR REGULATORY REFORM v (2009) (“The U.S. financial regulatory framework can be summed up in four words: highly fragmented and ineffective.”) (link); see also GAO, FINANCIAL REGULATION: INDUSTRY TRENDS CONTINUE TO CHALLENGE THE FEDERAL REGULATORY STRUCTURE 18 (2007) [hereinafter GAO, FINANCIAL REGULATION] (pointing out that industry participants offering similar services and engaging in equally risky activities may be subject to different rules and oversight by different regulatory bodies) (link).

¹⁰⁹ GAO, FINANCIAL REGULATION, *supra* note 108, at 18.

¹¹⁰ *Id.* at 17–18; GROUP OF THIRTY (G30), THE STRUCTURE OF FINANCIAL SUPERVISION: APPROACHES AND CHALLENGES IN A GLOBAL MARKETPLACE 210 (2008) (noting that “[t]he complex array of supervisory agencies [in the United States] requires a high degree of coordination”).

¹¹¹ GAO, CFTC AND SEC: ISSUES RELATED TO THE SHAD-JOHNSON JURISDICTIONAL ACCORD 5–6 (2000) (link).

¹¹² See *id.* (describing SEC and CFTC shared jurisdiction and jurisdictional disputes over security futures).

¹¹³ See Pub. L. No. 106-554, app. E, 114 Stat. 2763, 2763A-365 to -461 (2000) (amending Commodity Exchange Act, 7 U.S.C §§ 1–8609 (2006)).

¹¹⁴ See *supra* note 2 and accompanying text.

¹¹⁵ See, e.g., TREASURY BLUEPRINT, *supra* note 2, at 120 (noting that broker-dealers and their salespeople “are subject to a broad range of SEC and FINRA regulatory requirements, including standards of operational conduct and financial capability, training, experience, and competence in their line of business”); ANGELA A. HUNG ET AL., INVESTOR AND INDUSTRY PERSPECTIVES ON INVESTMENT ADVISERS AND BROKER-DEALERS 12–17 (2008) (describing Investment Advisers Act regulations applicable to “financial planners, money managers, and investment consultants”) (link).

them to be lightly regulated under separate regimes from multiple federal regulators.¹¹⁶ A number of self-regulatory organizations (SROs), including the stock exchanges and the Financial Industry Regulatory Authority, also have regulated in the securities and futures arenas, subject in turn to additional regulatory oversight.¹¹⁷ The large number of financial market regulators and regulatory regimes in the United States underscores that more regulation does not necessarily lead to better regulation. Rather, this regulatory landscape has led to significant regulatory fragmentation and has also contributed to regulatory gaps and failures that diminish the effectiveness of regulatory frameworks. Furthermore, existing regulatory overlaps are highly inefficient.

While the SEC/CFTC regulatory split reflects the historical origins of futures in the agricultural sector and stock markets in the financial sector,¹¹⁸ the split makes little sense in a world of hybrid financial instruments and increasingly converged and networked securities and commodities markets.¹¹⁹ Prior to the credit crisis, banking regulation was similarly fragmented, distributed among multiple state regulators and five federal banking regulators.¹²⁰ Insurance regulation remained the responsibility of the states, and therefore similarly lacked cohesion.¹²¹ “Regulators have attempted with varying success to alleviate the problems of regulatory frag-

¹¹⁶ See Arewa, *supra* note 4, at 30–32 (describing how hedge funds may be subject to SEC, CFTC and Federal Energy Regulatory Commission oversight, and may be required to become members of the National Futures Association, a futures industry self-regulatory organization (SRO)).

¹¹⁷ See GAO, SECURITIES AND EXCHANGE COMMISSION: OPPORTUNITIES EXIST TO IMPROVE OVERSIGHT OF SELF-REGULATORY ORGANIZATIONS 1 (2007) (link); G30, *supra* note 110, at 213 (discussing the role of SROs, in the U.S. securities and futures industry regulations, of establishing and enforcing rules governing member conduct and trading, monitoring trading activity to prevent market manipulation, and examining members for financial strength).

¹¹⁸ See TREASURY BLUEPRINT, *supra* note 2, at 45 (explaining that the Department of Agriculture initially had federal jurisdiction over futures markets and that congressional CFTC oversight remains vested in the Senate and House Agricultural Committees); WILLIAM G. FERRIS, THE GRAIN TRADERS: THE HISTORY OF THE CHICAGO BOARD OF TRADE (1988) (discussing the origins of the Chicago Board of Trade).

¹¹⁹ See TREASURY BLUEPRINT, *supra* note 2, at 11 (“The realities of the current marketplace have significantly diminished, if not entirely eliminated, the original reason for the regulatory bifurcation between the futures and securities markets.”); see also Letter from Marc E. Lackritz, President & CEO, Sec. Indus. & Fin. Mkts. Ass’n, to Jeffrey Stoltzfoos, Senior Advisor, Office of the Assistant Sec’y for Fin. Insts., U.S. Dep’t of Treasury, & Mario Ugoletti, Dir., Office of Fin. Insts. Policy, U.S. Dep’t of Treasury (Nov. 21, 2007), at 9–11, available at http://www.sifma.org/regulatory/comment_letters/58152600.pdf (recommending consolidation of the SEC and CFTC) (link).

¹²⁰ See TREASURY BLUEPRINT, *supra* note 2, at 32–42 (describing the history of banking regulation and the entities historically responsible for banking industry oversight).

¹²¹ See McCarran-Ferguson Act, ch. 20, 59 Stat. 33 (1945) (codified as amended at 15 U.S.C. §§ 1011–15 (2000)) (link); Susan Randall, *Insurance Regulation in the United States: Regulatory Federalism and the National Association of Insurance Commissioners*, 26 FLA. ST. U. L. REV. 625, 626, 633–34 (1999) (noting federal-state tension over insurance regulation and describing the passage of the McCarran-Ferguson Act, which made insurance regulation primarily a state law prerogative) (link).

mentation through interagency cooperation,” but fragmentation still exists within individual regulatory bodies.¹²²

In contrast to the United States, where regulatory frameworks reflect early twentieth century designs, other countries have modernized their financial services regulatory frameworks. In the United Kingdom, for example, a single primary regulator oversees financial markets, while a separate regulator ensures financial stability.¹²³ When Australia recently modernized its financial services regulatory structure, it adopted a Twin Peaks regulation-by-objective model,¹²⁴ and now has two primary financial market regulators, a separate system stability regulator, and another regulator that focuses on nonfinancial market conduct and consumer protection.¹²⁵ U.S. financial market oversight is based on functional regulators whose operational spheres track industry institutional structures of prior eras,¹²⁶ which leads to ineffective and inefficient regulatory frameworks. Fixing financial market regulatory shortcomings will require legislation that transforms financial industry oversight in fundamental ways.

The potential complexity of regulatory requirements has significant implications for financial services firms, which may need to deal with multiple regulators and requirements. Further, existing U.S. financial market regulatory structures are not well suited to the pervasive trading activities that currently characterize financial markets and do not effectively regulate such activities. In this trading-centered universe, the activities of individual market players are not easily located within the existing scope of regulatory enforcement. AIG, for example, “a heavily regulated insurance company at both the federal and state level, has subsidiaries that have been major issuers of [CDS]” contracts.¹²⁷ The CDS is a “major OTC derivatives insurance

¹²² Arewa, *supra* note 4, at 30.

¹²³ G30, *supra* note 110, at 175–182.

¹²⁴ Twin Peaks is a relatively new regulatory approach to financial market regulation adopted by Australia and the Netherlands that is similar to the integrated approach exemplified by the U.K. Financial Services Authority. Arewa, *supra* note 4, at 14. The integrated approach involves consolidation of financial market regulation under a single financial market regulator. *Id.* To avoid potential conflicts in the integrated approach between prudential or safety and soundness regulation and conduct of business/consumer protection, the Twin Peaks approach separates prudential safety and soundness regulation from conduct of business regulation/consumer protection and has separate regulators for each regulatory objective. *Id.* at 14, 37–38.

¹²⁵ G30, *supra* note 110, at 188–196.

¹²⁶ TREASURY BLUEPRINT, *supra* note 2, at 139 (characterizing the U.S. regulatory system as an institutionally based functional system); GAO, *supra* note 111, at 9 (“[F]inancial products or activities generally are regulated according to their function, no matter who offers the product or participates in the activity. Broker-dealer activities, for instance, are generally subject to SEC’s jurisdiction, whether the broker-dealer is a subsidiary of a bank holding company subject to Federal Reserve supervision or a subsidiary of an investment bank.”).

¹²⁷ Arewa, *supra* note 4, at 31–32; see Am. Int’l Group, Inc., Annual Report (Form 10-K), at 11 (Feb. 28, 2008) (noting that AIG subsidiary AIGFP is a principal in a broad range of financial transactions, including CDS transactions) (link).

product that is a significant force in financial markets.”¹²⁸ “Although AIG is an insurance company whose main insurance subsidiaries are regulated by the states in which they do business,”¹²⁹ prior to the credit crisis, AIG’s holding company and subsidiaries were also subject to prudential federal banking oversight by the Office of Thrift Supervision (OTS) because AIG has a federal savings bank subsidiary.¹³⁰ The extensive and layered regulation of AIG “failed to avert its near collapse and need for a government bailout and takeover.”¹³¹ The regulation of AIG illustrates core features of the U.S. financial regulation frameworks that typically determine regulatory oversight by a combination of functional and institutional factors. Under this typical regulatory framework, regulatory classifications are sometimes given more importance than the nature of the activities occurring within a firm.

The flurry of reform proposals following the credit crisis reflects widespread recognition that the existing financial market regulatory architecture is not a good fit for current financial market system dynamics. However, the enactment of yet more regulation is unlikely to do much to prevent the next crisis. Financial market regulatory frameworks should continually be evaluated to ensure that they are both effective and efficient. Moreover, the inefficient and patchwork U.S. system is costly for regulated entities. The fact that the current crisis unfolded within entities that are subject to significant regulation does not bode well for the ability of existing frameworks and regulators to identify and create firewalls around sectors or entities that threaten market integrity. The fragmented nature of financial markets regulation makes an accurate assessment of systemic risk difficult, because each separate regulator lacks a comprehensive vision of the system as a whole.

¹²⁸ Arewa, *supra* note 4, at 32.

¹²⁹ *Id.* at 32; see AIG Report, *supra* note 127, at 13.

¹³⁰ AIG Report, *supra* note 127, at 13 (noting in 2007 that AIG is subject to OTS regulation, examination, supervision and reporting requirements, and that since its subsidiaries are subject to OTS enforcement authority, OTS can restrict or prohibit activities that are “determined to be a serious risk to the financial safety, soundness or stability of AIG’s subsidiary savings association”); Posting of Justin Fox to Curious Capitalist Blog, *The Government’s AIG Dilemma*, <http://curiouscapitalist.blogs.time.com/2008/11/10/the-governments-aig-dilemma> (Nov. 10, 2008, 13:19 EST) (noting that OTS examiners regularly reviewed the accounts of AIG Financial Products and that AIG was subject to closer federal scrutiny than Bear Stearns or Lehman Brothers) (link).

¹³¹ Arewa, *supra* note 4, at 32; see also Matthew Karnitschnig, Deborah Solomon, Liam Pleven & Jon E. Hilsenrath, *U.S. to Take Over AIG in \$85 Billion Bailout; Central Banks Inject Cash as Credit Dries Up*, WSJ.COM, Sept. 16, 2008, <http://online.wsj.com/article/SB122156561931242905.html> (describing government seizure of AIG in which the U.S. government effectively received a 79.9% equity stake in AIG) (link); Matthew Karnitschnig, Liam Pleven & Serena Ng, *U.S. Throws New Lifeline to AIG, Scrapping Original Rescue Deal*, WSJ.COM, Nov. 10, 2008, <http://online.wsj.com/article/SB122627437470412029.html> (describing replacement of original \$123 billion AIG bailout with a new \$150 billion bailout package) (link); *More Background on AIGFP: Behind Insurer’s Crisis, Blind Eye to a Web of Risk*, <http://alexmasterley.blogspot.com/2008/10/more-background-on-aigfp.html> (Oct. 21, 2008, 01:08 EST) (explaining the cause of AIG’s failure) (link).

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Further, regulatory coordination with respect to systemic risk management may be hindered by existing regulatory turf battles.¹³²

¹³² See, e.g., Arewa, *supra* note 4, at 28–29 (noting the regulatory turf battle between the SEC and the CFTC over securities and futures regulation).